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COLLISION.

COLLISION, from the Latin *Colliſio*, a breaking, knocking, or daſhing together, in *Philoſophy* and in *Mechanics*, means the meeting, mutual ſtriking, or congreſs, of two or more bodies, one of which at leaſt is in motion. The colliſions of bodies, and the reſults ariſing from thoſe colliſions, form by far the greateſt part of the operations of nature, as well as of artificial mechanics; hence the induſtry of man has ſpared no pains in the inveſtigation of the laws which regulate thoſe motions, and in the performance of experiments tending to confirm and to illuſtrate the ſame. In the theory of colliſion or percuſſion, the ſimpleſt caſes are conſidered firſt, and ſuch, indeed, as cannot actually take place in nature; for inſtance, two bodies are ſuppoſed to move equally (that is, each of them, or one at leaſt, to run through equal lengths in equal portions of time) in non-reſiſting mediums, and thoſe bodies are farther ſuppoſed to be either hard, or ſoft, or elaſtic. A hard body is that whoſe parts retain their reſpective ſituation or figure in all caſes, not yielding to any ſtroke or percuſſion. A ſoft body is that whoſe parts yield to any ſtroke, and have no power to recover their original ſituation; and laſtly, an elaſtic body is that whoſe parts yield to any ſtroke, but preſently regain their original form and ſituation.. Now, in nature, (as far as we know) there are no bodies perfectly elaſtic or perfectly unelaſtic; including under the latter name both thoſe that are perfectly hard and thoſe that are perfectly ſoft. All the bodies we are acquainted with are partially elaſtic, but in various degrees; nor can their motions take place without meeting with ſome obſtruction. Yet the laws of colliſion, under the above-mentioned ſuppoſitions, being demonſtratively deduced from the general laws of motion, which are juſtly aſſumed as axioms, determine the phenomena which would take place if thoſe ſuppoſitions were real; it being afterwards more eaſy and practicable to eſtimate, and to allow for thoſe deviations of practical reſults from the abſtract theory, which ariſe from the imperfect elaſticity of bodies, from reſiſtances of mediums, from friction, &c.

The theory of colliſion is derived from ſir Iſaac Newton's third law of motion, which ſays, that action and re-action are always equal and contrary to each other. See LAWS *of motion.*

Definition 1. *The reſpective velocities or celerities of bodies are proportional to the ſpaces which they deſcribe in a given time.* Thus, if a body, A, paſſes through an extenſion of 10 feet in one ſecond of time, whilſt the body, B, runs through an extenſion of 100 feet in the ſame time, then the reſpective celerities of thoſe bodies are ſaid to be as 10 to 100; or as one to ten.

Def. 2. *The bodies are ſaid to ſtrike directly againſt each other, when in ſtriking, there occurs no reaſon why they ſhould turn towards one ſide rather than towards another; ſo that both before and after the ſtroke, the motion is in the ſame ſtraight line, unleſs it be all deſtroyed.*

Def. 3. *In every other caſe the ſtroke is ſaid to be oblique.* The principal propoſition belonging to this theory, conſiders two bodies that ſtrike directly againſt each other, and the reſult is conciſely expreſſed by ſir Iſaac Newton in the following words: "the quantity of motion, that is gathered by taking the ſum of the motions made towards the ſame part, and the difference of thoſe made towards the contrary parts, is not altered by the action of bodies amongſt themſelves." For the ſake of perſpicuity we ſhall endeavour to demonſtrate this propoſition, by conſidering the two caſes ſeparately.

THEOREM I.

If a body, A, (*Plate* XV. *Mechanics*, fig. 1.) *ſtrike directly againſt another body*, B, *which is either at reſt, or moving in the ſame direction, but ſlower; the ſum of the motions in both the bodies towards the ſame parts, will remain the ſame after the ſtroke, as it was before that ſtroke.*

Let C D expreſs the motion of the body A, and E F the motion of the body B; *viz.* that whilſt A moves from C to D, B moves from E to F. Therefore, the ſum of the motions is C D plus E F. Now, ſince it moves with greater velocity than B moves with, it neceſſarily follows, that A muſt overtake, and ſtrike againſt B. And it will appear, that after the ſtroke the ſum of the motions is the ſame as it was before, *viz.* C D plus E F. For ſince action and re-action are equal (3d law of motion), if A, by ſtriking on B, communicates to it the additional motion F G; it muſt loſe as much itſelf; *viz.* D K (equal to F G) muſt be ſubtracted from C D. So that after the ſtroke, C K is the motion of A, and E G that of B; and the ſum of thoſe motions is C K plus E G, equal to C D plus E F; for, ſince F G is equal to D K, add E F and C K to both, and it will be $FG + EF + CK$ equal to $KD + CK + EF$; *viz.* $EG + CK = CD + EF$.

The various caſes of this propoſition are as follow: If F G is equal to C D, then K and C coincide, and C K vaniſhes or becomes equal to nothing (as in *fig.* 2.); hence, after the ſtroke, A will be at reſt.

If F G exceed C D; then K will fall beyond C; and the motion of A will become retrograde or negative (as in *fig.* 3.) Therefore, the ſum of the motions towards the ſame part is the difference between E G and C K; *viz.* E G minus C K.

If B ſtood at reſt, then its motion becomes equal to 0, and in that caſe the ſum of the motions is reduced to C D.

THEOREM II.

If two bodies, moving towards contrary parts, ſtrike directly againſt each other, the ſum of their motions towards the ſame parts (which is the difference of their motions towards contrary parts) before and after the ſtroke, will always remain the ſame towards the ſame parts.

Let the body, A (*fig.* 4.), move from C towards D, and let C D repreſent its motion, whilſt the body, B, moves in a contrary direction from E towards F, and let E F repreſent its motion.

Make D H equal to E F; then C H is the difference of the motions towards the contrary parts, and is, at the ſame time, the ſum of the motions towards the ſame part; *viz.* towards G. Now, after the ſtroke, the ſame, C H, will be as the ſum of the motions towards the ſame part, *viz.* towards G.

Let the motion of B, after the ſtroke, be towards G, and let it be repreſented by E G. Therefore, the force communicated to B is F E plus E G, that is, F G. But (by the 3d law of motion) making D K equal to F G, D K will repreſent the motion loſt by A; ſo that if D K be ſubtracted from C D, the remainder, C K, will be the motion of A towards G. Now, ſince D K is equal to F G, and D H is equal to F E; it will be D K minus D H, (*viz.* K H), equal to F G minus F E (*viz.* E G). Therefore, ſince K H is equal to E G; K H will repreſent the motion of B after the ſtroke, and C K will repreſent the motion of A; ſo that C K plus K H is equal to C H, and is the ſum of the motions of both the bodies towards G.

If F G is equal to C D (as in *fig.* 5.); then K and C coincide, conſequently the motion of A becomes equal to *o*.

If F G exceeds C D (as in *fig.* 6.) K will fall beyond C, and the motion of A will be retrograde; but (ſince F G is equal to D K, and F E to D H) K H will be equal to E G; therefore, taking C K from both, C H will be equal to E G minus C K. But C H was as the ſum of the motions towards G before the ſtroke, and E G minus C K is as the ſum of the motions towards the ſame part; namely, as the difference of the motions towards the contrary parts after the ſtroke. Therefore, the ſum of the motions towards the ſame part will be the ſame both before and after the ſtroke.

Having demonſtrated the two ſimpleſt theorems belonging to the doctrine of colliſion, wherein the equality of the motions before and after the ſtroke has been conſidered, it is now neceſſary to examine the direction, the velocity, and the momentum of the bodies after the ſtroke; and for this purpoſe the properties of the centre of gravity muſt be recollected.

But, that property of the centre of gravity, which is more immediately concerned with the preſent ſubject, is briefly expreſſed in the following lines:

If bodies, moving in the ſame ſtraight line, ſtrike againſt each other, the ſtate of their common centre of gravity will not thereby be altered; viz. *it will either remain at reſt, or it will continue to move in the ſame ſtraight line, exactly as it moved before the ſtroke.* See CENTER *of Gravity*.

THEOREM III.

Let there be two non-elaſtic bodies (*viz.* either perfectly hard or perfectly ſoft); *and if one of them move in a ſtraight line, whilſt the other is at reſt in that line, or is moving in the ſame direction, but at a ſlower rate, or is moving in the contrary direction; then thoſe bodies muſt ſtrike directly againſt each other, and after the ſtroke they will either remain at reſt, or they will move on together, conjointly with their common centre of gravity.—Their momentum, after the ſtroke, will be equal to the ſum of their momentums before the ſtroke, if they both moved in the ſame direction; but it will be equal to the difference of their momentums if they moved in contrary directions.—Their velocity, after the ſtroke, will be equal to the quotient that ariſes from dividing the ſum of their momentums, if they both moved the ſame way, or the difference of their momentums, if they moved contrary ways, by the ſum of their quantities of matter.*

That, after the ſtroke, the two bodies muſt either remain at reſt or move on together, is evident; for, ſince they are not elaſtic, there exiſts no power that can effect their ſeparation. With reſpect to the momentum, it muſt be obſerved, that where the bodies meet (by the 3d law of motion), whatever part of the momentum is loſt by one of the bodies, muſt be acquired by the other; therefore, if before the ſtroke the bodies moved the ſame way, their joint momentum, after the ſtroke, will be equal to the ſum of their momentums before the ſtroke. If one of the bodies was at reſt, then, as its momentum is equal 0, the joint momentum will be equal to the momentum of the other body before the meeting. If the bodies moved towards each other, then their momentum, after the meeting, will be equal to the difference of their former momentums; and if in this caſe their momentums are equal, then their difference vaniſhes; that is, the bodies will remain at reſt after their meeting.

The laſt part of the theorem is evident; for the momentum of a body in motion is equal to the product of the velocity multiplied by the quantity of matter. See MOMENTUM.

The weights and velocities of the two bodies before their meeting being given, the velocity, after the meeting, may be determined by the following method, which is applicable to the four caſes of *figs.* 7, 8, 9, and 10. Let A and B be the two bodies, C their common centre of gravity, and D the place of their meeting. Make D E equal to D C, ſo that the point, D, may be between C and E; then D E will repreſent the velocity after their meeting; for, ſince the bodies, after their meeting, move together conjointly with their common centre of gravity; and the centre of gravity has the property mentioned immediately before the third theorem; it follows that the velocity of their common centre of gravity after their meeting, muſt be equal to its velocity before the meeting; *viz.* D E muſt be equal to C D, and is the ſame as the velocity of the two bodies after the meeting, becauſe, then, they move together with the centre of gravity.

Fig. 7. ſhews when the bodies move the ſame way. *Fig.* 8. ſhews the body, B, at reſt before the ſtroke, in which caſe B and D coincide. In *fig.* 9. the two bodies move towards each other; and *fig.* 10. ſhews the two bodies moving towards each other with equal momentums, in which caſe they will remain at reſt after the meeting. In all thoſe four figures, the reſpective velocities of the bodies are repreſented by A D and B D, and A B is their difference. The reſpective momentums are repreſented by the product of the weight of A multiplied by A D, and of the weight of B multiplied by B D. The momentum after the meeting is repreſented by the weights of both the bodies multiplied by D E.

Example of the computation of the firſt caſe, fig. 7.—Let A weigh 10 lb. and move at the rate of 4 feet per minute. Let B weigh 6 lb., and move at the rate of 2 feet per minute, and let the diſtance A B be 32 feet. The centre of gravity is found by ſaying $16 : 32 :: 10 : BC = \frac{32 \times 10}{16} = 20$ feet; hence $AC = 12$ feet. Put $BD = x$, and A D will be equal to $32 + x$. Then the time employed by A in moving from A to D, is equal to the quotient of the ſpace, $32 + x$, divided by its velocity; *viz.* $= \frac{32 + x}{4}$. And the time employed by B in moving from B to D, is equal to the quotient of the ſpace, x, divided by the velocity of B, *viz.* $= \frac{x}{2}$. But, ſince the bodies meet at D, thoſe times muſt be equal; that is, $\frac{32 + x}{4} = \frac{x}{2}$; and by the reſolution of this ſimple equation, we have $64 + 2x = 4x$; and $x = 32 = BD$.

Then $DE = DB + BC = 32 + 20 = 52$ feet; *viz.* after the meeting, the two bodies will move from D to E, which are 52 feet apart, in as much time as each of them employed in going to D; *viz.* 16 minutes. Therefore, in order to find how many feet per minute the bodies will run over after the meeting, divide 52 by 16, and the quotient, $3\frac{1}{4}$, is the anſwer.

The magnitude or quantity of the ſtroke is deduced from the third general law of motion, and from the nature of the momentum of a body in motion, which is equal to the product of the quantity of matter, or weight of the body, multiplied by the velocity, conſequently in the ſame body the momentum is proportionate to the velocity. The particulars relative to the magnitude of the ſtroke, are expreſſed in the following theorem.

Theorem IV.

If a body in motion ſtrike directly againſt another body, the magnitude of the ſtroke is proportional to the momentum loſt, at the concourſe, by the more powerful body. Alſo, when the latter body is at reſt, the quantity of the ſtroke is proportional to the velocity of the former body.—If the ſecond body be moving in the ſame direction with the firſt, but at a ſlower rate, the magnitude of the ſtroke will be the ſame as if the ſecond body ſtood ſtill, and the firſt impinged upon it with a velocity equal to the difference of their velocities.—And, laſtly, if the bodies move directly towards each other, the magnitude of the ſtroke is the ſame as if one of the bodies ſtood at reſt, and the other ſtruck it with the ſum of their velocities.

Thus much may ſuffice with reſpect to the congreſs or colliſion of non-elaſtic bodies. It is now neceſſary to ſtate the particulars belonging to the congreſs of elaſtic bodies; *viz.* of thoſe whoſe parts yield to any impreſſion, but frequently recover their ſituation, by re-acting the contrary way with a force, which, in bodies perfectly elaſtic, is equal to the impreſſion or ſtroke received. There are innumerable degrees of elaſticity. See Elasticity.

Theorem V.

When two bodies, that are perfect elaſtic, ſtrike directly againſt each other, their relative velocity (by which is meant the exceſs whereby the velocity of the ſwifter body exceeds that of the ſlower) *will be the ſame before and after the ſtroke;* viz. *they will recede from each other with the ſame velocity with which they approached before the ſtroke.*

The magnitude of the ſtroke (Theor. IV.) is proportional to the reſpective velocities. And in bodies that are perfectly elaſtic, the reſtoring force is equal to the compreſſing one; therefore, if the momentums of the bodies produced a certain compreſſion, the elaſtic force muſt re-act on the bodies with equal power; hence the bodies will be forced to recede from each other with the ſame velocity with which they approached each other.

From what has been ſtated above, the reſults ariſing from the congreſs of bodies that are perfectly elaſtic, may be eaſily deduced in all the variety of caſes in which the two bodies may be conceived to meet. The particulars upon which thoſe reſults more immediately depend, are, firſt, that the diſtances of two bodies from their common centre of gravity are inverſely as their weights; (ſee Center *of Gravity* and its properties); ſecondly, that the ſtate or the uniform motion of the centre of gravity of bodies is not altered by the mutual action of thoſe bodies on each other; thirdly, that in bodies that are perfectly elaſtic, the reſtoring is equal to the compreſſing force; and fourthly, that the diſtances of the bodies from each other, and from their common centre of gravity, are equal in equal times taken before and after the ſtroke; for in thoſe two caſes they move with equal velocities.

All the caſes of direct congreſs of two perfectly elaſtic bodies are delineated in the figures 11, 12, 13, 14, 15, 16, 17, 18, and 19, in which A and B repreſent the two bodies; C is their common centre of gravity, D the place where they meet. A D expreſſes the velocity of A, B D the velocity of B, and C D that of the centre of gravity. Hence by inſpecting the figures it will be eaſily diſcerned when both the bodies are in motion, or one of them is at reſt; alſo their directions, &c. Then the rule for determining the velocities after the ſtroke is as follows:—Take a point E in the line A B, produced if neceſſary, ſo that the diſtance C E be equal to C D; then, after the ſtroke, the right line E A will expreſs the velocity of the body A from E towards A, and the right line E B will expreſs the velocity of B from E towards B.

In *fig.* 11, B is larger than A, (which is plainly indicated by the ſituation of the centre of gravity C), B is at reſt, and A ſtrikes againſt it. In this caſe, after the ſtroke, both the bodies will recede from the point D, with the velocities E A and E B.

In *fig.* 12, A, the larger body, runs againſt the body B, which is at reſt. In *fig.* 13, the body A is larger than B, and they are both in motion the ſame way. In *fig.* 14, A is leſs than B; the reſt as in the preceding caſe. In *fig.* 15, A and B meet at D, where A remains at reſt. In *fig.* 16, A and B are equal, and after the ſtroke they recede with interchanged velocities. In *fig.* 17, the bodies are proportional to their velocities; hence the points C, F, D, and E, coincide. In *fig.* 18, A remains ſtationary at the place of congreſs D. Laſtly, in *fig.* 19, though the bodies A and B meet at D between the points A and B, yet after the ſtroke they both move towards F.

The numerical computation of thoſe caſes may be eaſily comprehended by the following example, which is adapted to the caſe of *fig.* 13.

A and B are two elaſtic bodies. A weighs 2 lb., and moves at the rate of 8 feet per ſecond. B weighs 1 lb., and moves the ſame way at the rate of 5 feet per ſecond. The diſtance A B is 12 feet.

1. To find the place of the centre of gravity C, we have $A + B : B :: AB : CA$; *viz.* $3 : 1 :: 12 : 4$; ſo that $AC = 4$, and $CB = AB - AC = 8$.

2. To find the diſtance BD, put $BD = x$; and ſince the diſtances A D and B D are run over in the ſame time, the former at the rate of 8, and the latter at the rate of 5 feet per ſecond; therefore we have $\frac{x}{5} = \frac{x + 12}{8}$: hence $8x = 5x + 60$; and $3x = 60$; or $x = 20 = BD$.

3. If the diſtance B D; *viz.* 20, be divided by the velocity of B (*viz.* by 5); the quotient 4, is the number of ſeconds, during which the bodies moved from their reſpective places A and B, to the place of their congreſs D.

4. $EC = CD = CB + BD = 8 + 20 = 28$; and $EA = EC - AC = 28 - 4 = 24$; which being divided by 4 (the number of ſeconds found above) gives 6 for the velocity of A after the ſtroke, in the direction from E towards A. Alſo $EB = EC + CB = 28 + 8 = 36$; which being divided by 4 (the number of ſeconds, &c.) gives 9 for the velocity of B after the ſtroke in the direction from E towards B. So that after the ſtroke, the bodies A and B will both continue to move the ſame way, but the former at the rate of 6, and the latter at the rate of 9 feet per ſecond.

It is now neceſſary to apply the above theory to thoſe caſes which really occur in nature, and in the firſt, ſince all known bodies are partially elaſtic, we muſt ſhew how to eſtimate the reſults of the colliſion of ſuch bodies. Thus, let A and B, *figs.* 20 and 21, be two bodies imperfectly elaſtic, C their common centre of gravity and D the place of their meeting. Divide AC in *a*, ſo that AC may be to *a*C, as the force compreſſing the body, A, is to the force whereby it reſtores itſelf. Alſo divide BC in *b*; ſo that BC may be to *b*C as the force compreſſing the body B is to the force whereby it reſtores itſelf. Take CE equal to CD; then the right line E*a* will expreſs the velocity of A after the ſtroke in the direction from E towards *a*, and the right line E*b* will expreſs the velocity of B after the ſtroke in the direction from E towards D.

In the foregoing paragraphs the diſtances have been reckoned from the centres of the bodies; but ſince the bodies muſt ſtrike with their ſurfaces, and not with the centres, therefore, when great accuracy is required, the thickneſſes of the bodies muſt be deducted from the diſtances. However, when the diſtances are conſiderable, and the ſizes of the bodies proportionately very ſmall, it is immaterial whether the diſtances be reckoned from the centres or from the ſurfaces of the bodies; the difference becoming inſignificant.

When more than two bodies move in the ſame ſtraight line, the computation of the velocity of each body after the various ſtrokes cannot be expreſſed under any general rules; the variety of caſes being too great, and often very intricate: yet when any particular caſe preſents itſelf, the preceding rules will be found ſufficient to determine the particulars; obſerving to apply the computation to the two bodies which, from the circumſtances of the caſe, appear to ſtrike firſt, then to one of thoſe and the next, and ſo forth. But ſometimes the equality of the bodies, their being contiguous to each other, and other favourable particulars, render the calculation pretty eaſy and obvious. Thus, if any number of equal and perfectly elaſtic bodies lie at reſt, contiguous to each other in the ſame ſtraight line, and another body, equal to one of them, ſtrike the firſt of them in the ſame ſtraight line, with any velocity; then after the ſtroke the ſtriking body and all the reſt will remain motionleſs, and the laſt body only will move on with the velocity of the ſtriking body.

If the movements, inſtead of being equable, as we have hitherto ſuppoſed, be either accelerated or retarded, the momentum for each ſingle ſmall portion of time, muſt be reckoned ſuch as belongs to the velocity acquired at that particular moment. In curvilinear movements, the direction of the motion in each point is the ſame as that of the tangent to the curve at that point. Laſtly, if the movements, either accelerated or retarded, be likewiſe curvilinear (as in the vibration of pendulums;) the momentum for each ſingle point muſt be deduced from the degree of acceleration and from the direction of the tangent, at that particular point.

Hitherto we have conſidered the colliſion of bodies, which ſtrike directly againſt each other; that is, in a direction perpendicular to their ſurfaces, and in the direction of their centres. It is now neceſſary to treat of oblique colliſion; for which purpoſe the doctrine of the compoſition and reſolution of forces, or of movements, muſt be previouſly known. See *Compoſition and reſolution of* FORCES.

THEOREM VI.

If a body, perfectly elaſtic, as A, fig. 22, *ſtrike obliquely at* C *on the firm obſtacle* B F, *then, after the ſtroke, this body will be reflected from that obſtacle in the direction* C E, *in ſuch a manner as to form the angle of reflection* E C F, *equal to the angle of incidence* A C B.

The oblique force, A C, being reſolved into two forces, *viz.* D C perpendicular to the obſtacle, and A D parallel to it; the effect on the plane is the ſame as if the body had advanced towards it directly from D, and (according to the laws already ſtated) the body A, after the ſtroke, would be ſent back in the direction C D. But of the two forces into which the original force of A was reſolved, this body retains the one repreſented by A D, ſince this force was not concerned in ſtriking the obſtacle; therefore, after the ſtroke, the body, A, is actuated by two forces, *viz.* one repreſented by C D, equal to A B, equal to E F; and the other repreſented by C F, equal to D A, equal to D E; hence it muſt move in the diagonal C E; and ſince the lines C F, F E, are reſpectively equal to the lines C B, B A, and the angles at B and F are equal, being right angles; therefore the triangle, E F C, is in every reſpect equal to the triangle A C B; conſequently the angle of reflection, E C F, is equal to the angle of incidence A C B.

It evidently follows, from this propoſition, that the force of an oblique ſtroke is to that of the ſame ſtroke coming in a perpendicular direction, as the ſine of the angle of incidence is to radius.

If the body, inſtead of ſtriking upon a plane ſtrikes upon a curve ſurface, the effect is the ſame as if it ſtruck on a plane, tangent to that ſurface at the ſtriking point.

This being premiſed, the application of the foregoing rules to the oblique colliſion of bodies will be illuſtrated by the following examples.

Let two non-elaſtic bodies A and B, *fig.* 23, move, the former in the direction A C, the latter in the direction B D, and let them meet at C D. Draw the line, M G, through their centres, and through the point of contact. From A and B, *viz.* the original ſituation of thoſe bodies, drop A M and B N perpendicular on M G. Then the force of each body may be reſolved into two forces, *viz.* that of A into A M and M C; and that of B into B N and N D. Of its two forces, A retains the force A M, whilſt M C is exerted againſt the other body. Of the two forces of the body B, the force B N is retained by it, whilſt the force N D is exerted againſt the other body. Therefore, the actions of thoſe bodies upon each other is exactly the ſame as if they moved directly one from M and the other from N; hence the above ſtated rules of direct colliſion, will ſerve to find out whether the bodies, after the ſtroke, will proceed both the ſame way, or different ways, and at what rate. But when their velocities have been thus determined; for inſtance, if it be found, that had the bodies moved directly from M and N after the ſtroke, the body, A, would have moved as far as O, whilſt the body, B, would have moved as far as G; then it muſt be recollected, that, in the preſent caſe of oblique colliſion, the body, A, has retained the force A M; therefore, after the ſtroke, the body, A, is actuated by two forces, *viz.* one equal and parallel to A M, and another which is equal and parallel to C O, in conſequence of which this body muſt run a compound courſe, which is found thus: Through the centre, C, draw C I equal and parallel to A M; through I, draw I E equal and parallel to C O, then the diagonal C E exhibits the velocity and the direction of the body, A, after the oblique concourſe. With reſpect to the body, B, it has been ſaid, that at the concourſe this body retains the force B N, and that, if the bodies had moved directly towards each other, B would, after the ſtroke, have moved from D to G. Therefore, through D draw D H equal and parallel to B N, and through H draw H F equal and parallel to D G; and, laſtly, the diagonal, D F, will repreſent the velocity and the direction of the body, B, after the oblique concourſe.

If the bodies be perfectly elaſtic, then ſuppoſe it be found (by the rules for elaſtic bodies) that, after the ſuppoſed direct concourſe, the body, A, would have been ſent back to Q, in the ſame time that B would have been ſent back to R; it follows, that after the oblique ſtroke, the body, A, will be actuated by two forces, *viz.* one equal and parallel to A M, and the other equal and parallel to C Q. The body, B, will likewiſe be actuated by two forces, *viz.* one equal and parallel to B N, and the other equal and parallel to D R; therefore, in *fig.* 24, draw Q Z through Q, equal and parallel to A M; alſo through Z draw I Z equal and parallel to C Q; then the diagonal, C Z, repreſents the direction and the velocity of the elaſtic body, A, after the oblique ſtroke.—Again, through R draw the line, R X, equal and parallel to B N, and through X draw the line, X Y, equal and parallel to D R, then the diagonal, D X, will repreſent the velocity and the direction of the elaſtic body, B, after the oblique ſtroke.

Amongſt all the caſes of colliſion, we have hitherto omitted to mention the ſtriking of a body upon an immoveable obſtacle. This has been done merely becauſe the particulars belonging to it may be eaſily derived from the conſideration of the foregoing caſes; it being only neceſſary to conſider this caſe as if it were that of the colliſion of two bodies, either elaſtic or non-elaſtic, or partially ſo, and to ſuppoſe that one of the bodies, which repreſents the immoveable obſtacle, is infinitely great.

There is a difference between the ſtroke of an elaſtic body, and that of a non-elaſtic one, which, not being very obvious, deſerves to be mentioned. This is, that the effect of the blow of an elaſtic body upon another body, as upon a plane, is double to that of a non-elaſtic body, their maſſes and velocities being equal. This ariſes from the elaſticity of the former, which, after the ſtroke, by endeavouring to recover its original figure, acts upon the plane with a force equal to the firſt impreſſion; whereas a non-elaſtic body acts only with the firſt impreſſion. See the article PERCUSSION. Alſo, if the reader wiſh to ſee the original inveſtigation of the laws belonging to the colliſion of bodies, together with any analytical and experimental illuſtration of the ſame, he may peruſe Dr. Wallis's paper in the Phil. Tranſ. No. 43; Mr. Huygens's paper, Phil. Tranſ. No. 46; ſir Chriſt. Wren's paper, Phil. Tranſ. No. 43; Graveſande's Mat. Elem. of Nat. Phil. edited by Deſaguliers; Gregory's Mechanics, vol. i. chap. v.; and all the beſt works on mechanics.

COLLIUS, PETER, in *Biography*, of the college of Milan, flouriſhed in the beginning of the ſeventeenth century, and was the author of a curious treatiſe entitled "De Animalibus Paganorum," printed at Milan in two vols. 4to. in the years 1622-3. In this work he decides without heſitation on the future happineſs or miſery of many virtuous and truly illuſtrious characters of the Pagan world. His concluſions were founded on conjectures, deduced from a comparative view of their means of divine knowledge, their lives and manners, their opinions and writings, united with the teſtimony of ſacred and profane hiſtory. He publiſhed alſo a treatiſe "De ſanguine Chriſti," and a quarto volume entitled "Concluſiones Theologicæ." In them all is a great diſplay of ſingularity, accompanied with a good ſhare of talents. Nouv. Dict. Hiſt.

COLLIWILY, in *Geography*, a town of the iſland of Ceylon; 50 miles W. of Trincomaly.

COLLMEN, or CULLMEN, a town of Germany, in the circle of Upper Saxony, and circle of Leipſick; 6 miles E.N.E. of Mutſchen.

COLLOBRIERES, a town of France, in the department of the Var, and chief place of a canton, in the diſtrict of Toulon; 18 miles N.E. of Toulon. The place contains 1509, and the canton 2933 inhabitants: the territory includes 322½ kilometres, and two communes.

COLLOCOCCUS, in *Botany*, Sloan. See CORDIA *Collococca*.

COLLON, in *Geography*, a poſt and fair town of the county of Louth, Ireland, which is neat and well built; and which has improved conſiderably under the auſpices of the late lord chief baron Foſter, and his ſon the right honourable John Foſter, the much reſpected ſpeaker of the Iriſh houſe of commons, when the union took place. It is 29 Iriſh miles N. from Dublin.

COLLONGE, a town of France, in the department of Lèman, and chief place of a canton, in the diſtrict of Genève; the place contains 1178, and the canton 8947 inhabitants: the territory comprehends 212½ kiliometres, and nine communes.

COLLOPS, in *Ancient Geography*, an appellation diſtinguiſhing two towns of Africa; the one called "Collops Parva," appears to have been the ſame with *Cullucitanæ*, ſituate E. of the Sinus Numidicus; the other, called "Collops Magna," was, according to Ptolemy, the ſame with *Cullu*, and ſituated N.W. of the ſame gulf.

COLLOQUIA, in *Eccleſiaſtical Hiſtory*, a name given in Swiſſerland to aſſemblies of the proteſtant Griſon clergy. Each league is divided into a certain number of diſtricts, the miniſters of which aſſemble twice every year; and theſe aſſemblies are called *colloquia*. Each colloquium has its preſident, and each league a ſuperintendent, called a dean. The ſupreme authority in ſpiritual concerns is veſted in the ſynod, which is compoſed of the three deans, and the clergy of each league; the ſynod aſſembles every year alternately in each of the three leagues. Candidates for holy orders are examined before the ſynod. The neceſſary qualification for admiſſion into the church, ought to be the knowledge of Hebrew, Greek, and Latin; but many are ordained without the leaſt acquaintance with either of theſe languages. Formerly Latin was ſolely uſed, as well in the debates of the ſynod, as for the purpoſe of examining the candidates; but at preſent that tongue is more and more diſuſed, and German is employed in its ſtead. See Grisons.

COLLOQUIUM, in *Law, (a colloquendo)*, a talking together, or affirming of a thing, laid in declarations for words in actions of ſlander, &c.

COLLUCIANISTÆ, in *Church Hiſtory*, a deſignation given to the Arians, from the martyr Lucian, a preſbyter of Antioch.

COLLUM, in *Anatomy*. See Neck, and Cervix.

COLLURIO, in *Ornithology*, the name given by Briſſon to the *Lanius Collurio* of the Linnæan *Fauna Suecica;* red backed ſhrike of Engliſh writers.

Collurio *madagaſcarienſis*, of Briſſon, the hook-billed ſhrike, *lanius curviroſtris*.

COLLUSION, a ſecret underſtanding between two parties, who plead, or proceed, fraudulently againſt each other, to the prejudice of a third. This colluſion is either apparent, when it ſhows itſelf on the face of the act; or more commonly, it is ſecret and artfully concealed by a ſhow of honeſty. This is a practice which the law abhors; and, therefore, when detected, it makes void all things dependent upon it, though otherwiſe in themſelves good. Co. Litt. 109, 360. Plowd. 54. Colluſion may ſometimes be tried in the ſame action, wherein the covin is, and ſometimes in another action, as for lands aliened in mortmain by a *quale jus;* and where it is apparent, the proof of it is unneceſſary; but when it is ſecret, it muſt be proved by witneſſes, and found by a jury like other matters of fact. 9 Rep. 33. The ſtatute of Weſtm. 2. 13 Ed. I. c. 33. gives the writ *quale jus*, and inquiry in theſe caſes; and there are ſeveral other ſtatutes relating to deeds, made by colluſion and fraud. The caſes particularly mentioned by the ſtatute of Weſtm. 2. are of *quare impedit*, *aſſiſe*, &c. which one corporation brings againſt another, with intent to recover the land or advowſon, for which the writ is brought, held in mortmain, &c. See Fraud.

In the canon law, colluſion, in matters of benefices, vacates the benefice, and incapacitates the perſon from holding any benefice at all.

COLLUTHIANS, in *Eccleſiaſtical Hiſtory*, a religious ſect, which roſe about the beginning of the fourth century; on occaſion of the indulgence ſhewn to Arius by Alexander, patriarch of Alexandria.

Several people being ſcandalized at ſo much condeſcenſion; and, among the reſt, Colluthus, a prieſt of the ſame city; he hence took a pretence for holding ſeparate aſſemblies, and by degrees proceeded to the ordination of prieſts, as if he had been a biſhop; pretending a neceſſity for this authority, in order to oppoſe Arius. To his ſchiſm he added hereſy; teaching, that God did not create the wicked; that he was not author of the evils that befal men, &c.—He was condemned by a council held at Alexandria by Oſius, in the year 330.

COLLUTHUS, in *Biography*, a preſbyter of Alexandria, was founder of the temporary Chriſtian ſect, at the beginning of the fourth century, above-mentioned. By the decrees of the council held by Oſius, Colluthus was deſpoiled of the epiſcopal honours with which he had inveſted himſelf, and the preſbyters whom he had ordained were degraded. Colluthus ſubmitted to the decree, and returned quietly to the duties of his office as a parochial preſbyter; his followers likewiſe re-united themſelves to the orthodox church. Nouv. Dict. Hiſt.

COLLUTION, *Collutio*, in *Medical Writers*, is ſometimes uſed for the waſhing of the mouth, particularly, when done to clean or faſten bad or looſe teeth; or free the gums, &c. from ulcers.

COLLUVIES, a term which Calcott and other writers on the univerſal deluge have applied to the fluid maſs, into which, according to their opinion, the ſtrata of the antediluvian earth were diſſolved, and their conſtituent corpuſcles ſeparated. See Deluge.

COLLYBUS, Κολλυϐος, in *Antiquity*, the ſame with what is now called the rate of exchange.

COLLYRÆ, or Collyrides, a certain ornament of hair, worn by women on their necks. It was made up in the form of the ſmall, roundiſh, cakes, called κολλυραι, *collyræ*.

COLLYRIDIANS, in *Church Hiſtory*, a ſect, towards the cloſe of the fourth century, denominated from a little cake, called by the Greeks κολλυριδιαι, *collyridia*, which they offered to the Virgin Mary.

This ſect, it ſeems, conſiſted chiefly of Arabian women, who brought it from Thrace to Arabia, and who, out of an extravagance of devotion to the Virgin, met on a certain day in the year, to celebrate a ſolemn feaſt, and to render divine honours to Mary as to a goddeſs; eating the cake which they offered in her name.—St. Epiphanius, who relates the hiſtory of this ſuperſtitious ceremony, ridicules it. They ſprung up in oppoſition to the Antidico-Marianites.

COLLYRIUM, κολλυριον. This term was formerly applied, to any medicament, ſolid, or liquid, employed to reſtrain defluxions; but it is now entirely confined to wet applications, topically applied for this purpoſe in complaints of the eyes.

Collyrium is alſo a name given to unguents uſed for the ſame purpoſe; as unguent of tutty, and ſeveral others.

Collyrium is alſo a denomination given, though improperly, to ſome liquid medicines uſed againſt venereal ulcers.

Collyrium *Samium*. See Samia *terra*.

COLLY-WESTON *Slate*, a whitiſh kind of micaceous grit ſtone, which ſplits into very thin lamina, and is much uſed for ſlating of buildings in the eaſtern and ſome of the midland counties of England; it is the produce of a ſtratum ſituated not far in the ſeries from the Oalite or Ketton ſtone, ſo well known to builders. In this ſtratum, particularly near Stonesfield, in Oxfordſhire, bones of animals of ſome unknown kind are frequently found lodged. See Slate.

COLM, in *Geography*, a ſmall iſland of Scotland, in the Frith of Forth, ſix miles S.E. of Dumferline.

COLMAN, George, in *Biography*, an Engliſh writer, was the ſon of Mr. Thomas Colman, Britiſh reſident at the court of the duke of Tuſcany. He was born at Florence about the year 1733. He received his ſchool education at Weſtminſter; and was entered as ſtudent at Chriſt-church, Oxford, where he engaged with Bonnel Thornton, in writing "the Connoiſſeur," a periodical paper of conſiderable merit, which was afterwards publiſhed in four volumes, 12mo. This work is remarkable for the humorous delineations of the manners of the age, and diſplays claſſical reading and taſte. On leaving the univerſity he entered at Lincoln's Inn, and was in due courſe called to the bar, but never followed his profeſſion. In 1760, he produced two dramatic pieces which were received with great ſucceſs, the firſt was entitled, "Polly Honeycombe," and the other "the Jealous Wife;" this laſt ſtill keeps its place on the ſtage. In 1764, lord Bath died and left Mr. Colman a handſome annuity, which was increaſed on the death of general Pulteney, in the year 1767. In conjunction with Garrick, he brought out the "Clandeſtine Marriage," a comedy of great merit, and which maintains an undiminiſhed reputation. In 1768, he purchaſed a ſhare of the Covent Garden theatre; this, however, he ſoon diſpoſed of, and purchaſed Mr. Foote's theatre in the Haymarket, which he held till his death in 1794, though he had for the five preceding years been incapable of any buſineſs, owing to a paralytic ſtroke with which he was ſeized in 1789, and which affected his underſtanding in ſuch a manner as to bring on derangement and idiocy. Mr. Colman tranſlated Terence's plays into a ſort of blank verſe: alſo "Horace's Art of Poetry," which added to his reputation as a claſſical ſcholar. In 1787, he collected, in three ſmall volumes, a variety of pieces which he had publiſhed at different times, under the title of "Proſe on ſeveral occaſions, accompanied with ſome pieces of verſe." Gen. Biog.

COLMAR, in *Geography*, a town of Germany, in the duchy of Holſtein, five miles S.E. of Gluckſtadt.

Colmar, a large and well built town of France, and capital of the department of the Upper Rhine, ſeated on the river Fecht, and ſurrounded by a wall, flanked with towers. It has a prefect and four courts of juſtice. The town contains 13,396, and the canton 14,429 inhabitants; the territory includes 55 kiliometres, and two communes; $10\frac{1}{2}$ leagues N. of Bâle. The principal trade of the inhabitants of Colmar, who are ſaid to be very induſtrious, is in corn, and wine; and their chief manufactures are thoſe of woollen cloth. callico prints, ſtockings, hardware, and gun-powder. The diſtrict conſiſts of 142 communes or townſhips, diſtributed into 13 cantons, and comprehending a population of 144,821 inhabitants. Its whole territory includes 1680 kiliometres. It has ſilver, copper, lead, antimony, arſenic, and beautiful cryſtal mines; and alſo a manufacture of gold and lace. N. lat. 48° 4′ 44″. E. long. 7° 22′ 11″.

COLMARS, a town of France, in the department of the Lower Alps, and chief place of a canton, in the diſtrict of Caſtillane; 22 miles N. of it. The place contains 898, and the canton 3585 inhabitants; the territory includes 285 kiliometres and five communes.

COLMBERG, or Kolbenberg, a town of Germany, in the circle of Franconia, and principality of Anſpach; 9 miles N.W. of it.

COLME, La, a river of France, branching from the river, Aa, at Watte, in the department of the ſtraits of Calais.

COLMENAR, a town of Spain, in Old Caſtile, on the confines of New Caſtile; 7 leagues N.W. of Talavera de la Reina.—Alſo, a town of Spain in New Caſtile, five leagues N.E. of Eſcurial.

COLMITZ, a town of Germany, in the archduchy of Auſtria, four miles S.S.W. of Droſſendorf.

COLMWORTH, a rectory in the county of Bedford, and hundred of Barford: the lofty ſpire of its ſteeple forms a very conſpicuous object to the ſurrounding country. In the Government Trigonometrical Survey in 1799, its ſituation was determined by obſervations from Lilley-Hoe ſtation, diſtant 97,617 feet, and bearing 0° 12′ 52″ S.E. from the parallel to the meridian of Greenwich; and from Lidlington ſtation 75,944 feet; whence is deduced its latitude 52° 12′ 49″.3 N. and its longitude 22′ 27″, or 1^m $29^s.8$ W. of Greenwich.

COLN, a river of England, which paſſes by Uxbridge and Colnbrook, and runs into the Thames, near Staines, ſeparating the county of Middleſex from Buckinghamſhire. The clearneſs and purity of the water of this river, iſſuing almoſt entirely in ſprings out of the chalk hills of Hertfordſhire, have always been proverbial. This circumſtance probably occaſioned the cutting, at ſome diſtant periods, of two channels many miles in length, for diverting part of its waters acroſs Hownſlow-heath to Twickenham, and into Buſhey-park; and a very principal part of the deſign of the Paddington branch of the Grand Junction Canal, in latter times, was for diverting part of its limpid ſtreams, in order to ſupply the metropolis with water, to which purpoſe it is admirably adapted.

Coln, a river of Eſſex, which is navigable from the mouth of the Thames at Merſey iſland up to the town of Colcheſter. See Canal.

Coln, a river which runs into the Thames at Cricklade.

COLNBROOK, a town of England, in the county of Bucks, on the river Coln, with a weekly market on Wedneſday, three miles E. of Windſor, and 17 W. from London.

COLNE, a conſiderable market-town of Lancaſhire, England, is advantageouſly ſituated on a dry and elevated ridge. This place, ſays Dr. Whitaker, "is unqueſtionably the *colunio* of the anonymous Ravennes, and was probably never abandoned entirely, in the long and obſcure period of Saxon hiſtory." At this place, there have been ſeveral Roman coins, and other antiquities found. The church is a ſpacious ſtructure, and appears to have been "reſtored about the time of Henry VII or VIII." Here are a market on Wedneſday, and two annual fairs. Colne is 218 miles N. of London, and contains 782 houſes, with 3626 inhabitants. This town is ſituated in the hundred of Blackburn, near to the grand ridge on its weſtern ſide, and alſo to the Leeds and Liverpool canal, and to the famous Foulridge tunnel upon it. It was once an object of contemplation to conduct a branch of the Rochdale canal to this town; but it was never accompliſhed. Whitaker's Hiſtory of Whalley, 4to. See Canal.

COLNUD, *de Cayenne*, of Buffon, in *Ornithology*, the bare-necked crow, *corvus nudus*.

COLOMBAUDE, the name given by Buffon to *motacilla atricapilla*, or black cap.

COLO, in *Geography*, a town of Poland, in the palatinate of Kaliſch, 20 miles N. of Kaliſch.

Colo, in *Ancient Geography*, a Roman colony, near the city of Conſtantina, in the kingdom of Algiers, in Africa; the ruins of it now remain, having a caſtle on a very high rock towards the ſea-coaſt, with a garriſon, under the command of an aga; under the protection of which is a ſmall French factory, that deals with the Moors for hides, wax, and wool. The mountains of Colo abound with a large and fierce kind of monkeys, which the Moors have the art of catching with great facility.

COLOBI, a people of Africa, placed by Ptolemy in the Troglodytic territory.

COLOBIUM, [illegible]ον, from κολοω, *I mutilate*, among the *Ancients*, an upper garment, without ſleeves, longer than the tun[illegible]

COLOBOMA, in *Medical Writers*, is uſed for the preternatural growing together of the lips, or eyelids, or for the adheſion of the ears to the head.

COLOBON Promontorium, in *Ancient Geography*, a promontory of Ethiopia, near Egypt, placed by Strabo and Ptolemy in the Arabic gulf.

COLOBONA, a town of Spain, in Bætica, placed by Pliny in the diſtrict of Hiſpalis: now Trebuxena.

COLOBRASUS, a town of Aſia, ſituate in the interior part of Cilicia Montana, which, according to Ptolemy, was a country of Pamphylia.

COLOCASIA, in *Botany*, Cluſ. See Arum *Colocaſia*.

COLOCASITES, in *Ancient Geography*, an iſland of the Red ſea, on the coaſt of Azania, a country of Ethiopia, according to Pliny.

COLOCOLO, in *Ornithology*, a name given by the people of the Philippine iſlands, to a bird called alſo there *caſſili*, and by ſome authors the *water raven*, corvus fluviatilis. This bird, as it is deſcribed in the Philoſophical Tranſactions (n. 285.) "is of the ſhape of a common raven, but is truly an amphibious bird, living more of its time under water than in the air; it is black in colour; its neck is remarkably long, and it feeds on fiſh, which it hunts under water, as they do one another; it feeds likewiſe on frogs, ſerpents, and ſhell-fiſh. It is common to ſee it under water in clear rivers, where it ſeems perfectly at eaſe, and runs about with great ſwiftneſs; at times it comes up to the ſurface, and dries its wings in the air and ſunſhine." It is underſtood by naturaliſts pretty generally, that the colocolo of the Philippines is no other than the common corvorant, *pelecanus carbo*, a bird known to inhabit moſt parts of the world, and to delight eſpecially in maritime ſituations, or in marſhes, and other watery places. near the ſea-coaſt.

COLOCYNTHIS, Coloquintida, *Bitter Apple*, in the *Materia Medica*. The colocynth is a ſpecies of gourd (*cucumis colocynthis*, Linn.) brought from Aleppo and Cyprus, of a globular ſhape, about the ſize of the fiſt, white, ſmooth, of a fungous texture, divided internally into large cells, which contain a number of oblong ſeeds.

The pulp, which is the part uſed medicinally, is intenſely bitter, nauſeous, and acrid. It contains a remarkably large portion of mucilage, ſo as to render ſlimy a conſiderable quantity of water when boiled with it; and, on this account too, the ſpirituous tincture is too thick to paſs through a paper filter.

The colocynth, taken in ſubſtance, without any mixture or preparation, is one of the moſt violent purgatives that we are acquainted with, producing, when in a large doſe (that is, when more than eight or ten grains), very ſevere griping pains, and often a diſcharge of blood, and leaving for ſome days ſymptoms reſembling thoſe of dyſentery. It is ſaid, too, to act upon the bowels when applied externally to the abdomen.

The activity of the colocynth renders it a valuable medicine, when uſed with caution. It is ſeldom or never employed by itſelf, but is mixed with aloes, and other purgatives, and much adds to their efficacy.

The only preparation of it retained in the London Pharmacopœia, is the extract (*extractum colocynthidis compoſitum olim ext. catharticum*), which is prepared by digeſting in proof ſpirit, colocynth, aloes, ſcammony, and cardamom ſeeds, and afterwards evaporating the tincture to the proper conſiſtence. This is one of the moſt certain and powerful purgatives we are acquainted with, and generally operates without much griping or inconvenience. It may be properly combined with calomel, if neceſſary, or, in caſes of ſpaſmodic pain of the bowels, with opium.

Colocynthis, in *Botany*. Tourn. Bauh. Pin. Ray. Moris. See Cucumis *colocynthis*.—Plum. See Trichosanthes *amara*.

COLOCZA, in *Geography*, a town of Hungary, on the Danube, the ſee of an archbiſhop. This was formerly an important place, but it is now ſunk into decay, in conſequence of repeated wars; 136 miles S.E. of Vienna. N. lat. 46° 33′. E. long. 18° 36′.

COLODI, a town of Italy, in the republic of Lucca; 7 miles from Lucca.

COLOE, in *Ancient Geography*, a marſh of Ethiopia, according to Ptolemy, which, he ſays, was the ſource of the river Aſtapus.—Alſo, a town, ſituated, according to Ptolemy, in the interior of Ethiopia; but, according to Arrian, it was a maritime town, and carried on a conſiderable commerce in ivory.

COLOEPHRYGES, a people of Greece, in Bæotia, called alſo *Anticondyles*, according to Steph-Byz.

COLOEPHRYX Mons, a mountain of Bæotia. Heſychius.

COLOES, *Enli-Gheul*, a lake of Aſia Minor, in Lydia, according to Strabo; called *Gigæa* by Homer. It was two leagues, or 40 ſtadia, to the N.E. of Sardes. Diana, ſurnamed *Coloëne*, had a temple on the bank of this lake, ſurrounded by the tombs of the kings of Lydia, and, among others, that of Aliattes, deſcribed by Herodotus, and compared by him with the grandeſt works of the Babylonians and Egyptians.

COLOGENBAR, a town of Aſia, ſituate near the Euphrates, and the town of Edeſſa.

COLOGNA, in *Geography*, a town of Italy, in the Paduan; 15 miles from Vicenza.

COLOGNE, Peter De, in *Biography*, a proteſtant miniſter at Metz, in the 16th century. He was born at Ghent, and educated at Paris, from whence, at the advice of Robert Stevens, he retired to Geneva, to avail himſelf of the inſtructions of John Calvin, who perſuaded him to devote his life to the work of the miniſtry. He embarked in the proteſtant cauſe with great zeal and ardour, and the ſuperiority of his talents above thoſe of his contemporaries, recommended him to the peculiar friendſhip of Calvin and Beza. He commenced his miniſterial functions at Metz, in the year 1558, where he continued in the exerciſe of them either openly, or from houſe to houſe, in a private way, during the reigns of Francis II. and Charles IX. In the performance of his duty, he was occaſionally ſubjected to the miſeries of impriſonment and exile, until the diſperſion of the proteſtant church at Metz, in 1659. From this town he went to Heidelberg, where he undertook the charge of a congregation, and where he died while he was a young man. He was the author of ſome original works, and tranſlated others from the German into the French language, but, as they were moſtly on temporary ſubjects, it is not neceſſary to enumerate them. Nouv. Dict. Hiſt.

Cologne, in *Geography*, an archi-epiſcopal electorate of Germany, in the circle of the Lower Rhine, divided into ſeveral diſtricts by other eſtates, and deriving its name from the city of Cologne. It was a biſhopric in the year 314, and, in 799, was erected into an archbiſhopric by Charlemagne. In the ancient conſtitution of Germany, the archbiſhop aſſumed the title of born legate of the holy ſee, and arch-chancellor of the ſacred empire for Italy. He gave his vote after the elector of Treves, and ſat at the right hand of the emperor, at aſſemblies held in his own dioceſe, in Gaul, or in Italy. The metropolitan church, and chapter, which is compoſed of 25 canons, and 36 dignitaries, are at Cologne. Since the French revolution, and the ſubſequent arrangement of its territories, Cologne is a diſtrict of Roer, or Roor, comprehending 10 cantons, *viz.* Cologne, Bergheim, Bruhl, Dormagen, Elſen, Juliers, Kerpen, Lechnich, Wayden, Zulpich, which include 294 communes, 1375 kilometres, and 137,215 inhabitants. Although this electorate is reckoned one of the moſt fertile countries of Europe, the bigotry, ignorance, and idleneſs of its inhabitants, who are moſtly Roman Catholics, prevent its deriving thoſe advantages from its productions, and particularly its commerce, which might reaſonably be expected.

Cologne, the capital of the archbiſhopric above mentioned, and formerly one of the free and imperial cities of Germany, in the circle of Weſtphalia. It was taken poſſeſſion of by the French in 1794, and is now the capital of the diſtrict that bears its name in the French department of Roer, and is ſaid to contain 38,844 inhabitants. Cologne is ſituated, in the form of a creſcent, on the banks of the Rhine, and fortified in the ancient manner; but its walls are in ſo decayed and tottering a ſtate, that they are incapable of affording it any defence. The whole of its length, along the river, is about 3½ miles, two-thirds of which ſpace is uninhabited; ſeveral of the ſquares and ſtreets more reſembling a field, or an uncultivated garden, than parts of an inhabited city. In traverſing its environs one may obſerve more than 150 miſerable farm-houſes, with gardens, which furniſh the city with all ſorts of greens, butter, cheeſe, milk, &c. The ſtreets are narrow, winding, and gloomy, and moſt of the houſes are very high, old, and ruinous; and yet this city is ſaid to contain, within its compaſs, more churches, chapels, and monaſteries, than there are days in the year. The Roman Catholic univerſity ſcarcely merits the appellation. The number of beggars that diſgrace its police is very great, and it is ſaid, that the propenſity to idleneſs, gluttony, and begging, which prevails through the city and adjacent country, is ſanctioned and encouraged by the example of the different orders of monks; whoſe chief object is to keep the people, who, with the exception of a few Proteſtant families, are Roman Catholics, in a ſtate of ignorance and ſuperſtition. Two thirds of the inhabitants are either profeſſed beggars, or eccleſiaſtics. The other third conſiſts of a few patricians, merchants, and mechanics, on the produce of whoſe exertions and induſtry the reſt live.

Cologne, upon the whole, is at leaſt two centuries behind the other parts of Germany, with regard to improvement in the arts and ſciences. Although no city in Germany is more favourably ſituated for commerce, the natural bigotry and idleneſs of the inhabitants lead them to forego the benefits which their ſituation affords them; and their trade has dwindled away to the manufacture of a few ribbands, ſtockings, lace, and tobacco. The veſſels that may be always ſeen in the port of Cologne are very numerous; the quay, more than 1½ mile long, is continually crowded with ſhips; but the goods on board are almoſt wholly the property of foreign merchants. About a fortnight before the fair at Frankfort begins, there is a great concourſe of theſe merchants at Cologne, who repair daily from thence to Frankfort, by means of two commodious veſſels containing from 150 to 200 paſſengers, which perform this voyage every other day during the fair. The Jews were expelled from Cologne in the year 1485, and from that remote period not one of them has ever obtained leave to ſettle there, or dared even to enter the city without permiſſion of the magiſtrate. Under the old police, if a Jew came into the city, he was accompanied by a guard during his ſtay, and obliged to pay a ducat for every hour of his continuance there. In the year 1618, the Proteſtants were alſo expelled, but ſome years after they obtained permiſſion to return. The magiſtrates indeed gave them leave to erect a place of worſhip, which was deſtroyed by the infatuated mob as ſoon as it was finiſhed. Since that event they have erected for themſelves ſeveral handſome churches at Mulheim, three miles from Cologne, on the right bank of the Rhine. The trifling commerce of Cologne has been confined to a few Proteſtant families ever ſince the period of their return, who, it is obſerved, are the only opulent inhabitants of the place. The wealth of the churches at Cologne, at leaſt before it was taken poſſeſſion of by its new occupiers, was immenſe, particularly that of the cathedral. Theſe churches are repoſitories of various relics that are held in high eſtimation by the ſuperſtitious catholics. The theatre is a roomy building, but not elegant. The town-houſe is an irregular ſtone edifice, aukward and in a ruinous ſtate. The arſenal occaſions part of a very narrow ſtreet; its contents are chiefly ancient arms, not proper for modern uſe; and the building itſelf is in a ſtate of decay. The dealers of Nuremberg and Augſburg bring their toys in large quantities to Cologne for exportation to Holland, England, and America. The Spaniards and Portugueſe carry on a very profitable trade with them in both the Indies. The inhabitants of Cologne derive a very conſiderable advantage from the importation of coals out of the adjacent countries of Berg, the electorate of Treves, the principalities of Saarbruck, and duchy of Deuxponts, which come by the Saar down the Moſelle and the Rhine, and ſupply the want of wood-fuel, that is very ſcarce about Cologne. Some of theſe coals are round and large, and another ſort conſiſts of duſt, which is mixed with clay and water, and formed into ſmall cakes, manufactured in ſummer; and which, being gradually hardened by the heat of the ſun, are ſtored up in large magazines erected for that purpoſe. Theſe coal-cakes are ſold at 12 ſtivers (about 1 *s.* Engliſh money) per hundred; and it is ſaid, that 100 of them will go as far as three buſhels. Near this city ſome pſeudo-volcanic remains have been traced, which are thought to be ſuch as are mentioned by Tacitus at the cloſe of the 13th book of his Annals, the effects of ſubterranean fire which ravaged the country of the Juhones. N. lat. 50° 55′ 21″. E. long. 6° 55′.

Cologne, a town of France, in the department of Gers, and chief place of a canton, in the diſtrict of Lombès; ſix leagues E. of Auch. The place contains 769, and the canton 6096 inhabitants; the territory comprehends 117½ kilometres, and 17 communes.

Cologne *Earth*, a ſubſtance uſed in painting, as a water colour, much approaching to amber in its ſtructure, and of a deep brown. It has generally been eſteemed a genuine earth, but has been diſcovered to contain a great deal of vegetable matter, and, indeed, it is a very ſingular ſubſtance.

It never conſtitutes an entire ſtratum in the earth, but is lodged among other ſtrata in large flat detached maſſes. It is moderately dry, while in the earth, and of a ſoft crumbly texture. When dried, it is of a deep, duſky brown, of a very cloſe, compact, and fine texture, and very remarkably light; it is of a ſmooth, even ſurface, dry, but not harſh to the touch, crumbles eaſily to pieces between the fingers, and ſlightly ſtains the hands; it adheres firmly to the tongue, but not at all reſembling the aſtringency of the boles, or any thing elſe of the mineral kingdom, but plainly reſembling the taſte of oak bark. It makes no efferveſcence with acids; if thrown into water, it ſwims on the ſurface, till thoroughly wetted; and if brought into contact with burning coals, it takes fire and burns of itſelf, till reduced to yellowiſh aſhes.

It is eaſy to diſcern from this account, that, though this is generally eſteemed an earth, and known to the world by no other name, it is no pure native foſſil, but contains more vegetable than mineral matter, and owes its origin to the remains of wood which has been long buried in the earth. It is dug in Germany and France; the quantities conſumed in painting, in London, are brought from Cologne, where it is found very plentifully; but our own kingdom is not without it, it being found near Birmingham, and on Mendip hills in Somerſetſhire; but what has been yet found there is not ſo pure or fine, as that imported from Cologne. Hill's Hiſt. of Foſſils. p. 64. and Da Coſta's Hiſt. of Foſſils, p. 121.

COLOGNOLI, in *Geography*, a town of Italy, in the duchy of Tuſcany; 6 miles E. of Leghorn.

COLOKITIA, or KOLOKITIA, a town of European Turkey, on the ſouthern coaſt of the Morea, in a gulf to which it gives name; 25 miles S.E. of Miſitra. N. lat. 36° 47′. E. long. 22° 34′.

COLOMAY, a town of Poland, in the palatinate of Red Ruſſia; 5 miles N.E. of Halecz.

COLOMBA, in the *Materia Medica*. See COLUMBO.

COLOMBEL, NICOLAS, in *Biography*, a French painter who was born in 1646, at Sotteville near Rouen, and became the ſcholar of Le Sueur, under whom he ſtudied ſeveral years; he then went to Italy, where he aſſiduouſly copied the works of Raffaelle and Nicolo Pouſſin; but though he enjoyed every advantage of education, and laboured to form his ſtyle upon the model of thoſe great maſters, the poverty of his genius ever appeared; and his pictures, though correctly drawn and carefully finiſhed, generally wanted that elevation of thought and ſtriking expreſſion, which can alone give value to hiſtoric painting. However, in 1682, he ſent four pictures which he had painted at Rome to Paris, and thereby gained ſufficient reputation to cauſe his being choſen a member of the Academy upon his return to Paris in 1694. One of his moſt eſteemed pictures is an "Orpheus playing on his Lyre," in the apartment of the menagerie in the royal palace. He died in the year 1717. D'Argenville.

COLOMBES, in *Geography*, a town of France, in the department of Paris, and chief place of a canton, in the diſtrict of St. Denys; 1½ league N.W. of Paris.

COLOMBEY, a town of France, in the department of the Meurthe, and chief place of a canton, in the diſtrict of Toul; 15 miles S.W. of Nancy. The place contains 858 and the canton 12,887 inhabitants; the territory includes 315 kiliometres and 32 communes.

COLOMBIEN, DE, in *Biography*. See VALENTINE.

COLOMBIER, in *Geography*, a town of France, in the department of the Upper Saone, and chief place of a canton, in the diſtrict of Veſoul; four miles N. E. of Veſoul.

COLOMBIER, a town of Swiſſerland, in the principality of Neuchatel; two miles S.W. of Neuchatel.

COLOMBIERE, CLAUDE DE LA, in *Biography*, a celebrated French jeſuit, was born near Lyons, in which city he proſecuted his ſtudies, devoting moſt of his time to rhetoric and theology. Of the former branch of ſcience he became a profeſſor, and in the latter he was diſtinguiſhed as a popular and impreſſive preacher. In this character he was noticed at the court of the duke of York, afterwards James II. of England, being made chaplain and confeſſor to the ducheſs, until he was baniſhed under ſuſpicion of being engaged in a conſpiracy. He returned to his native country in the year 1682,, where he died at the age of 41. Colombiere publiſhed ſix volumes of ſermons, which are elegant, pious, and ſimple; they have been often reprinted. He publiſhed alſo a "Collection of Orations" in Latin, delivered by the author as profeſſor of rhetoric; a volume of "Moral Reflections;" two volumes of "Spiritual Letters;" and "A Syſtem and Office for the Solemnity of the Worſhip of the Heart of Jeſus," which the jeſuits employed a conſiderable time in every Catholic country, as a powerful inſtrument in favour of the papal cauſe. Patru, a well known writer, deſcribes Colombiere as one who thoroughly underſtood the niceſt refinements of the French language. Nouv. Dict. Hiſt.

COLOMBINI, COSIMO, an engraver of Florence, who engraved a great part of the portraits of painters inſerted in the magnificent work of the "Muſeum Florentinum." He flouriſhed about 1754. Strutt. Heinecken.

COLOMBONI, DON ANGIOL MARIA, a very celebrated painter of miniature and natural hiſtory, was born at Gubbio in the year 1608, and at a very early period of life became a monk of the order of Mount Oliveto. He made conſiderable progreſs in literature, and in the mathematics, and publiſhed at Bologna, in the year 1669, a book on ſundialling, entitled "Pratica Gnomonica, ovvero Tavole, colle quali ciaſcuno agevolmente puo far da ſe gli Orologi da Sole." But he was not leſs admired for his miniatures, and for his excellent drawings of herbs, flowers, and birds, which he drew with ſuch taſte and correctneſs, and finiſhed with ſuch extraordinary delicacy and ſoftneſs, that he was ſtyled the Giovanni da Udine of his time, and the great Guercino uſed to call him the Raffaelle of his profeſſion. He left two volumes of theſe drawings of birds, in which not only the beautiful colours and the delicacy of the plumage were admirably repreſented, but, what was more extraordinary, each appeared exactly in the attitude moſt uſual to it or moſt characteriſtic. He ſpent great part of his life in Bologna, highly eſteemed, and died in the place of his nativity in the year 1672. Baldinucci.

COLOMBRARO, in *Geography*, a town of Naples, in the province of Baſilicata; 4½ miles S.S.W. of Turſi.

COLOMIES, PAUL, in *Biography*, was born at Rochelle; he embraced the Proteſtant religion, and followed his friend Iſaac Voſſius into England, where he attached himſelf to the cauſe of epiſcopacy, and even attacked the party among whom he had been educated, in a work entitled "Theologorum Preſbyterianorum Icon," which raiſed him many enemies. He was, however, rewarded by being made librarian at Lambeth, and reader at the epiſcopal French church in London. Here he died in January 1692, leaving the reputation of great ſkill in bibliography. He was author of "Gallia Orientalis," in 4to. which was an account of Frenchmen eminent for oriental learning; of a ſimilar work reſpecting Italy and Spain, with many others of conſiderable note at the time in which he flouriſhed. Bayle.

COLOMNA, FABIUS. See COLUMNA.

COLON, in *Anatomy*, from κοιλος, *hollow*; is a name applied to the greater part of the large inteſtine. See INTESTINE.

COLON, in *Grammar*, a point, or character, formed thus (:) ſerving to mark a pauſe, and to divide the members of a period. See POINTING. See alſo PERIOD, COMMA, and SEMICOLON.

Grammarians generally aſſign the uſe of a colon to be to mark the middle of a period; or to conclude a ſenſe leſs perfect than the dot, or period: but a ſenſe leſs perfect than the period, is an expreſſion extremely vague and indeterminate.

Others ſay, a colon is to be uſed when the ſenſe is perfect, but the ſentence not concluded: but neither is this ſufficiently clear and expreſs. Add to this, that in practice, our beſt writers confound the colon with the ſemicolon.

F. Buffier attempts to fix the uſe of the colon; but he does not much diſtinguiſh it from the ſemicolon: he preſcribes the uſe of either, indifferently, and calls them by a common name, *intermediate pointings;* as being mediums between the comma, and full point, or period. Their uſe, according to this author, is to diſtinguiſh the ſupernumerary members of a period. By ſupernumerary members are meant ſuch as the precedent ones do not raiſe any expectation of; *i. e.* ſuch parts as have indeed a dependence on what goes before, even though what goes before has a complete ſenſe, independent hereon: v. gr. "the Auguſtan age was ſo eminent for good poets, that they have ſerved as models to all others: yet did it not yield any good tragic poets;" where the ſupernumerary member, and the uſe of the colon, are obvious. The moſt obvious and ſenſible uſe of the colon, he adds, is, when the ſupernumerary member is diſtinguiſhed by ſome conjunction; as, "notwithſtanding, however, but, except that, unleſs, inaſmuch as, yet, ſince, the rather as, provided that," &c. Some, indeed, uſe the colon in the middle of long periods, without any regard to ſupernumerary members: which cuſtom was probably introduced to mark, that the breath is here to be taken almoſt as much as in a common period, in the place where the ſupernumerary period commences. But this, at beſt, is arbitrary; and the intermediate pointings may always be omitted in a period, if there be no ſupernumerary member, *i. e.* if there be no ſubſequent member, but what is expected from the precedent. As to the occaſions where the colon is to be uſed, rather than the ſemicolon, there is nothing preciſe to be ſaid of it; except that the colon ſhews the ſupernumerary member more detached, and ſets it at a greater diſtance from the reſt; and therefore marks a longer pauſe than the ſemicolon.

Accordingly, it ſeems preferable to uſe the ſemicolon before conjunctions adverſative, reſtrictive, conditional, &c. as, "nevertheleſs, but, excepting that, however, otherwiſe, provided that." Again, where the ſupernumerary phraſes not only ſuppoſe the precedent, but depend on them for their regimen, and are, as it were, new parts thereof; there the ſemicolon ſeems preferable to the colon: v. gr. "You are regardleſs of the goodneſs of God, who firſt choſe you; a God who is only jealous of your heart for your own happineſs; a God who could be equally glorious in deſtroying you by his juſtice, as in ſaving you by his mercy." Or thus: "The diſcourſe conſiſted of two parts; in the firſt was ſhewn the neceſſity of fighting; in the ſecond, the advantages that would redound from it." But this difference, it muſt be owned, has a dependence on ſomething that influences all the points, and ſways the whole doctrine of punctuation; *viz.* the length, or ſhortneſs, of the members and periods: for, when the phraſes are long, we point higher than when ſhort.

A later author, in an ingenious diſcourſe, "De Ratione Interpungendi," marks the office of the colon, and its difference from the ſemicolon, &c. more preciſely; a colon, on his principles, ſerves to diſtinguiſh thoſe conjunct members of a ſentence, which are capable of being divided into other members, whereof one at leaſt is conjunct. Thus, in the ſentence, "as we cannot diſcern the ſhadow moving along the dial-plate, ſo the advances we make in knowledge are only perceived by the diſtance gone over;" the two members being both ſimple, are only ſeparated by a comma: in this, "as we perceive the ſhadow to have moved, but did not perceive it moving; ſo our advances in underſtanding, in that they conſiſt of ſuch minute ſteps, as are only perceivable by the diſtance;" the ſentence being divided into two equal parts, and thoſe conjunct ones, ſince they include others, we ſeparate the former by a ſemicolon, and the latter by commas: but in this, "as we perceive the ſhadow to have moved along the dial, but did not perceive it moving; and it appears the graſs has grown, though nobody ever ſaw it grow: ſo the advances we make in knowledge, as they conſiſt of ſuch minute ſteps, are only perceivable by the diſtance." The advancement in knowledge is compared to the motion of a ſhadow, and the growth of graſs; which compariſon divides the ſentence into two principal parts: but ſince what is ſaid of the movement of the ſhadow, and likewiſe of the growth of graſs, contains two ſimple members, they are to be ſeparated by a ſemicolon; conſequently a higher pointing is required to ſeparate them from the other part of the ſentence, which they are oppoſed to; and this is a colon.

Biſhop Lowth obſerves, that a colon diſtinguiſhes a member of a ſentence, whether ſimple or compounded, which of itſelf would make a complete ſentence, and ſo requires a greater pauſe than a ſemicolon, yet is followed by an additional part, making a more full and perfect ſenſe. He adds, that a colon may be alſo uſed, when a ſemicolon has preceded, and a greater pauſe is ſtill neceſſary, though the ſentence be incomplete; and that it is commonly uſed, when an example, or a ſpeech, is introduced. Introd. to Eng. Gram. ed. 1772. p. 207.

COLONA, in *Botany*, Boſc. Nouv. Dict. Hiſt. Nat. Cavan. tab. 370. Claſs and order, *polyandria monogynia.*

Gen. Ch. *Cal.* five-leaved; leaves linear, coloured on the inſide, caducous. *Cor.* Petals five, with a nectareous ſcale at the baſe. *Stam.* Filaments numerous, inſerted into the top of a pentagonal column. *Piſt.* Germ placed at the top of the column, in the centre of the ſtamens, tetragonous-globular; ſtyle longer than the ſtamens; ſtigma ſimple. *Peric.* Drupe globular, with four wings, opening into four parts. *Seeds* oval, two in each diviſion of the drupe. Nearly allied to Grewia, and differing chiefly in the ſtructure of the pericarp.

Sp. C. *dentata.* A tree. *Leaves* alternate, almoſt ſeſſile, oval, toothed, very large. *Flowers* reddiſh, in axillary, ſolitary racemes, which ſometimes form a panicle. A native of the Philippine iſlands.

COLONÆ, in *Ancient Geography*, a town of Aſia Minor, in the Troade, placed by Strabo at the diſtance of 140 ſtadia from Ilium, in the territory of Lampſacus; it was a colony of Mileſians.—Alſo, a town of the ſame name, placed by Strabo near Chryſa; by d'Anville, S. of Troas.—Alſo, a town, mentioned by Anaximenes, cited by Strabo, and placed in Erythræa.—Alſo, a town of Greece, in Meſſenia, according to Ptolemy; now *Griſſo.*—Alſo, a town of Greece, in the Phocide.—Alſo, the name of a rock, on the bank of the Thracian Boſphorus, over-againſt the Cyanæan iſlands, at the entrance of the Euxine ſea.—Alſo, a town of Greece, in Theſſaly.—Alſo, a promontory near the river Lycus.

COLONEL, the officer who has the chief command of a regiment of horſe, foot, dragoons, or artillery. The lieutenant-colonel commands it in chief in the abſence of the colonel, to whom he is ſubordinate, as the other officers are in like manner to him, when he is preſent.

Colonel *of a regiment of horſe*, is the firſt officer in it, and commands it when preſent. His duty conſiſts chiefly in keeping the regiment complete; in having it compoſed of men and horſes that are fit for ſervice; in taking care to have them well exerciſed and inſtructed in the different evolutions, ſo that they may be able, on all occaſions, to form themſelves ſuitably to the ground they occupy or act on, or to the manner in which they may wiſh either to make or receive an attack. In France, Spain, and ſome other ſouthern nations of Europe, colonels of horſe have been uſually called *maîtres de camp*. But in Germany, and moſt northern nations, they are called *ritmeſters*.

Colonel *of dragoons*. His principal functions are the ſame as thoſe of a colonel of horſe. But he ought to be alſo in ſome meaſure acquainted with the duties of a colonel of infantry, as his men are liable to act either mounted or diſmounted.

Colonel *of foot, or infantry*. His functions are more extenſive and diverſified than thoſe of a colonel of horſe, as the infantry are employed for a greater variety of purpoſes, and on a greater diverſity of ſervices. Colonels of infantry ſhould be well acquainted with fortification, and with field-engineering (which, however, they ſeldom or ever are); ſince ſuch a thorough and comprehenſive knowledge of their principles, as enables an officer to apply them expeditiouſly and judiciouſly, is the beſt and ſafeſt guide to the proper formation and arrangement of troops in various ſituations, and to the advantageous occupation of ground and poſitions. A colonel of infantry ſhould be particularly careful to maintain union and harmony among his officers, and contentment among his men; to acquire the eſteem and confidence of both, and to make himſelf be reſpected by them; to which nothing contributes more than a ſteady, uniform, and impartial enforcement of ſubordination and diſcipline. He ſhould likewiſe be peculiarly attentive to the health and comfort of his men.

Colonel *of Artillery*; the commander of a battalion of artillery. His duties, when properly underſtood and attended to, are various and laborious, both in war and peace, and require, in order to be well performed, not only abilities, but alſo application, knowledge, and experience. He ought to be an able mathematician and mechanic, and ſhould be acquainted with all the duties of an engineer, that are connected with the uſe and application of artillery in different ſituations, and to different purpoſes; the conſtruction of batteries, platforms, field-works, the occupying of poſitions with artillery, to the beſt advantage, both as to direct and flanking fires, &c. Whatever ſituation he may be placed in, or on whatever ſervice he is going, he ſhould underſtand thoroughly what nature and ſpecies of ordnance is beſt adapted to it. He ſhould be acquainted with all the beſt and moſt uſeful experiments, that have been made with artillery in the different nations of Europe; he ſhould know the greateſt diſtance at which walls can be battered in breech effectually; the different charges of powder, beſt adapted for different ſervices, and different diſtances. And he ſhould not only be well acquainted with the wide differences between the ranges of cannon-ſhot and ſhells in the air, and thoſe which the parabolic theory gives for them *in vacuo*, but alſo be able to approximate, nearly to the truth, the diſtances to which projectiles will go in the air, thrown with given charges of powder, and given degrees of elevation. In ſhort, he ought to know a variety of things, which few officers of artillery actually do know.

Colonel *of Engineers*. See the article Engineer.

Colonel, *Lieutenant*, is, as has been already obſerved the ſecond officer belonging to a regiment, and commands it in the abſence of the colonel.

Colonel *General of the French Infantry*, or Colonel *General d'Infanterie Françoiſe*: an appointment of great truſt and authority, which took its birth, or originated, under Francis I. in 1544. It became an immediate gift of the crown, under Henry III. in 1584. It was at laſt ſuppreſſed, becauſe it gave too many prerogatives, and too much power to the perſon who was inveſted with it. Under Louis XV. however, it was re-eſtabliſhed in 1711, in favour of Louis, the firſt duke of Chartres. This officer had originally the right of nomination to every commiſſion and place of truſt in the infantry. He could order courts martial, and enforce the ſentences awarded by them, without any ſuſpenſion of his power in that reſpect. by an appeal to a ſuperior tribunal; and he had a company in every regiment of infantry, which was called the colonel general's company.

Colonel *Général d'Infanterie de Suiſſes et Griſons*. This appointment was not held of the crown; but it was almoſt always given to a prince. It took its riſe in right of office under Charles IX. in favour of the ſon of the conſtable of Montmorency, killed at the battle of St. Denis. All the Swiſs and Griſon troops were ſubordinate to the colonel general, the company *des cent Suiſſe de la garde* excepted. He appointed colonels and captains. The ſovereigns at laſt aſſumed, or reſumed, this right of nomination. But he ſtill retained the right of naming and preſenting to the king the officers of the nation, to be included in the promotion of general officers, and enjoyed ſeveral other prerogatives.

Colonel *Général de la Cavalerie légére et étrangére*. This charge, or employment, was created in right of office under Charles IX. It was, however, known before his time, in 1449, under the title of "capitaine general de la cavalerie Albanoiſe." Under Louis XIII. there were two ſuch colonels general, one of the French cavalry, and the other of the German cavalry. Though theſe general officers enjoyed great honours and prerogatives, the generals of the Roman cavalry, under the emperors, were perſons of ſtill greater importance. For they had the ſame authority over the troops and militia, that the kings and dictators had. The emperors treated them in their regulations and conſtitutions, as ſeignors of the higheſt rank, eminence, magnificence, and celebrity. They enjoyed an authority almoſt abſolute, over all military people.

Colonel *General des Dragons*, colonel general of dragoons. This appointment was created in 1688, by Louis XIV. It was, like the preceding ones, favoured with an attribution of great honours and particular prerogatives.

Colonel *de Troupes Légères*, colonel of light troops. This officer ought to be well inſtructed, both by ſtudy and experience, in the art of petty warfare, and the management of detachments. For, as he is almoſt always reſponſible for the corps confided to his charge, and forced to take advanced poſitions in an enemy's country, he is of conſequence the more expoſed to be ſurpriſed, taken, or at leaſt beaten.

COLONELLE, Compagnie, the firſt company in a French regiment.

COLONI, Adam, called the Old, in *Biography*, a painter who was born at Rotterdam, in 1634, but afterwards reſided and died in London, in 1685. The ſubjects of his pictures were generally wakes, country fairs, rural ſubjects, and cattle; beſides which, he made ſeveral copies from the pictures of the Baſſans, with ſucceſs. He had a ſon called Adrian Coloni the young, who received inſtructions from his brother-in-law, Van Dieſt, in addition to the leſſons beſtowed on him by his father. He frequently painted the figures in the landſcapes of Van Dieſt, as well as in thoſe of other maſters; and ſometimes imitated the touch of Salvator Roſa. At other times he produced pictures of hiſtory, but more generally thoſe of cattle, converſations, or landſcapes. Adrian died in the year 1701, aged 33. Pilkington.

Coloni, *Cape*, in *Geography*, lies on the W. coaſt of Aſiatic Turkey, N. of the gulf of Smyrna. N. lat. 39°. E. long. 26° 36′.

COLONIA, in *Ancient Geography*, an epiſcopal town of Aſia, under the metropolis of Sebaſte; ſituate in the firſt Armenia, and called alſo *Taxara*.—Alſo, an epiſcopal town of Aſia, in Cappadocia.—Alſo, a town of Italy, in Etruria.—Alſo, a town of the Iſle of Albion, in the route from Londinium to Lugwallium ad Vallum, between Cæſaromagus and Villa Fauſtini, according to the Itinerary of Antonine. Although our antiquarians are divided about the ſituation of Colonia, it ſeems, upon the whole, to be moſt probable that it was at Colcheſter, on the river Colne, from whence it derived its name.—Alſo, a town of the Damnii, according to Ptolemy, which ſome, as Camden and Baxter ſuppoſe, to have been Coldingham in the Mers, but which was more probably ſituated at or near Lanark, in Clydeſdale. See Coldingham.

Colonia, in *Geography*, a town of Iſtria; five miles S.S.E. of Rovigno.

Colonia *Agrippina Ubiorum*, in *Ancient Geography*, a town ſeated on the banks of the Rhine; now Cologne. It was built by the Ubii, when they left Germany to eſtabliſh themſelves in Gaul. Agrippina, the mother of Nero, fixed a colony of veterans in this place, and gave it her name in honour of the place of her birth.

Colonia *Equeſtris*, a town of Gallia Belgica, aſſigned by Pliny to the Helvetians; but by Ptolemy to the Sequani. The Itinerary of Antonine marks it under the name of "Equeſtris," between Bautas and Lacu Lauſanio. It was alſo called "Noiodunus," or "Nividunum;" but when it became a colony, the Romans called it "Colonia Equeſtris." It is now *Nion*.

Colonia *Flavia*, the town called Cæsarea of *Paleſtine*.

Colonia *Julia*, a town and Roman colony of Germany; now *Bonn*.

Colonia *Julia Celſa*, a town of Spain, which was a Roman colony; now a village called *Xelſa*.

Colonia *Julia Hiſpella*, a town and Roman colony of Italy, in Umbria; now *Spello*.

Colonia *Marcia*, a town of Spain, which had the title of Roman colony; now *Marchana*.

Colonia *Senenſis*, a town of Italy, in Etruria, which was a Roman colony; now *Sienne*.

Colonia *Septimanorum Juniorum*, a town of Gaul, with the title of colony; now *Beziers*.

Colonia *Trajana*, now *Koln*, or *Keln*, was ſituated at a ſmall diſtance from the Rhine, and about a mile from Cleves.

Colonia *Ulpia*, is now *Cleves*, which ſee.

COLONIDES, called *Colone*, by Ptolemy, a town of Meſſenia, ſeated on an eminence on the coaſt which bore northwards to the weſt of the gulf of Meſſenia. Its inhabitants are ſaid to have been conducted under the direction of an oracle, by a perſon named Colonus, from Attica to this country. In proceſs of time they aſſumed the manners and language of the Dorians. The mountain Temathea, called by Pauſanias Temathia, commenced towards Colonis, and extended itſelf towards the north-weſt, as far as mount Egaleus.

COLONIS, an iſland of Greece in the Argolic gulf, according to Pliny.

COLONNA, Giov. Paolo, Maeſtro di Capella di San Petronio di Bologna, in *Biography*, was the ſon of Antonio Colonna, alias del Corno, a celebrated organ builder of Breſcia. He compoſed but few operas; indeed, we know of but one, Amilcar in Cipro, for the theatre of Bologna, 1692; but he publiſhed about the latter end of the laſt century many excellent works for the church, of which P. Martin has given a liſt, to the amount of twelve, in the ſecond volume of his Hiſtory of Muſic.

It was the opinion of the late Dr. Boyce, that Colonna was Handel's model for choruſes accompanied with many inſtrumental parts, different from the vocal. But it muſt, however, be owned, that Handel has greatly ſurpaſſed his model in energy, fire, and vigour of genius. The pſalms of Colonna in eight real vocal parts, publiſhed at Bologna in 1694, have been very juſtly admired for their maſterly compoſition. Paolucci has inſerted the hymn, "Pange lingua," ſet in plain counterpoint of four parts by him, in a manner ſufficiently ſimple and ſyllabic for the moſt zealous reformers of church muſic. His "Sacre lamentationi della ſettimana ſanta, a voce ſola," publiſhed 1689, contain many pleaſing and elegant fragments of pathetic recitative, which we ſhould have admired much more if we had not previouſly been acquainted with the works of Cariſſimi, who had anticipated not only all the thoughts of Colonna in this ſpecies of muſic, but almoſt all thoſe of every compoſer of the preſent century. The airs of theſe lamentationi are too ſhort to make much impreſſion on the hearer.

Colonna had a controverſy with Corelli in 1685, concerning the conſecution of fifths in the firſt movements of the third ſonata of his Opera 2da. Every lover of muſic will be ſorry that the charge againſt Corelli ſhould be well-founded; but it muſt be owned that the baſe is indefenſible in the paſſage which has been condemned by Colonna, and was not likely to have paſſed uncenſured, even in an age much more licentious than that of Corelli.

Antimo Liberati, with whom Colonna was in correſpondence at the time of this controverſy, ſeems to defend Corelli's violation of the known rule againſt the conſecution of fifths, in a letter written 1685, "Sopra un ſeguito di quinte," in which he reaſons thus: "If a quaver reſt, or even a ſemiquaver, were not ſufficient to ſatiſfy the rule againſt fifths and eighths, a compoſer writing in many parts would have very narrow limits for the expanſion of his genius and fancy, or for varying the harmony." But with due reſpect for the authority of Antimo Liberati, and with peace to the aſhes of the gentle Corelli, the paſſage is unwarrantable, and ſeems the more inexcuſable, as ſeveral better baſes were eaſy to find, without altering his deſign, or deſtroying the effect of his trebles. It appears that the excellent theoriſt Berardi had a reverence for the profeſſional erudition of Colonna, by his dedicating to him the ſeventh chapter of his "Miſcellenea Muſicale."

Colonna, Michale Angelo. See Angelo.

Colonna, Marc-Antonio, bore arms from an early age in the ſervice of the Spaniards, and roſe to great military reputation. He was appointed by pope Pius V. general of his galleys, and ſerved in the famous battle of Lepanto, gained againſt the Turks in 1571. On his return, the pope honoured him with a triumphal entry after the manner of the ancient Roman conquerors. He poſſeſſed ſeveral high civil poſts, as conſtable of Naples, and viceroy of Sicily, and died in Spain in 1584. Moreri.

Colonna, Ascanio, was ſon of Marc Antonio, and educated under his father's roof by the celebrated Muretus.

He accompanied his father into Spain, and ſtudied at the univerſities of Alcala and Salamanca. Philip II. gave him an abbacy, and he was made cardinal by Sextus V. At the death of the king his patron, he delivered a funeral oration, which he printed. He was himſelf a promoter of literature, and collected a magnificent library. Owing to his great ſkill in canonical law, and the ſupport which he gave to the claims of the Catholic king, he was made viceroy of Catalonia. He afterwards wrote a canonical defence of the pope's conduct in his diſpute with the republic of Venice. This and ſome other letters and harangues he publiſhed, and died at Rome in 1608. Moreri.

Colonna, Fabius. See Columna.

Colonna, Francisco, was born about the middle of the fifteenth century, probably at Venice, and entered young into the order of Dominicans. The work by which he is chiefly known is "Hypnerotomachia di Poliphilo," which ſignifies *the combat of Love in a dream*, and *the Lover of Polia*. It conſiſts of fable, hiſtory, allegory, architecture, mathematics, &c. and is written in a language compounded of words taken from ſix or ſeven different languages. It was printed by Aldus in 1499, and a French tranſlation was publiſhed in 1546, and has been ſeveral times re-printed. The original and tranſlation have been in great requeſt among collectors of books, as well on account of their ſcarcity, as for the ſake of the beauty of the numerous wooden cuts with which the work is decorated. Colonna died at an advanced age, at Venice, in the year 1527.

Colonna, Prospero, a diſtinguiſhed military commander, was younger ſon of Anthony prince of Salerno, and born about the year 1452. He engaged in the ſervice of Ferdinand king of Naples, and after his death, in that of Charles VIII. king of France. When that prince undertook the conqueſt of Naples, Colonna, with his couſin Fabritio, rendered him ſome ſignal ſervices, but upon a change of politics, they returned to their former allegiance. Proſpero aſſiſted in the recovery of the kingdom of Naples; he was at the battles of Barletta and Garigliano, at which the French were worſted; and he ſignalized his valour and conduct at a variety of ſieges and other military actions. In the year 1515, while attempting to defend the paſſage of the Alps againſt the French, he was made priſoner, and carried to France, but being liberated, he reſumed his profeſſion in order to revenge the diſgrace that attached to him while a captive. He died in 1523, aged ſeventy-one, leaving behind him a very high character as a general; he was rather prudent and cautious than formed for remarkable enterpriſes. Though ſlow and inactive, he was, by conſtant vigilance, generally ſecured from ſurpriſe. He was the friend and patron of learned men. Moreri. Robertſon's Hiſt. ch. v. vol. ii.

Colonna, Pompeo, was brought up by his uncle Proſpero, and deſtined by him for literary purſuits. The young man inclined to the profeſſion of arms, and diſtinguiſhed himſelf as a military man till he was compelled to aſſume the eccleſiaſtical character. He was made biſhop of Rietti, and obtained many lucrative benefices. He was, however, little attentive to the duties of his ſacred office, and ſo regardleſs of the decorum that ought to be attached to it, that he accepted a challenge, and tore his caſſock to pieces that he might not be prevented from fighting. On a falſe report of the death of pope Julius II. in 1512, Pompeo joined in raiſing the cry of liberty, and took poſſeſſion of the capitol. For this he was deprived of his benefices, but by the intereſt of his uncle, matters were again accommodated, and in 1517, he was elevated to the rank of cardinal. Still, however, inclined to turbulent meaſures, his conduct gave his enemies the opportunity of charging him with the intention of putting the pope to death, in order that he might ſucceed to that high dignity; he was accordingly deprived of his offices, in which he was reinſtated on account of ſome important ſervices which he rendered to the reigning pontiff. He was afterwards viceroy of Naples, where he died in 1532. He was eſteemed a patron of literature, and wrote a poem "De laudibus mulierum," chiefly in praiſe of Vittoria Colonna. Moreri. Robertſon's Hiſt. ch. v. vol. ii.

Colonna, Vittoria, a learned lady and poeteſs, was born at Marino in 1490. At the age of ſeventeen, ſhe married Ferdinand Francis D'Avalos, marquis Peſcara, who, by her influence, was diſſuaded from accepting the kingdom of Naples, which was offered him after the victory of Pavia, in order to detach him from the ſervice of the emperor Charles V. After his death, which happened in 1525, ſhe lived in retirement, devoting herſelf to poetry; ſhe kept up, with much credit to herſelf, a friendly and learned correſpondence with ſome of the moſt celebrated literary characters of the age. In 1541, ſhe retired to the monaſtery at Orvieto, and from thence ſhe went to St. Catharine in Viterbo, but in 1547, ſhe returned to Rome, where ſhe died. Her poems have paſſed through many editions, and have been printed with the commentaries of learned men. Moreri.

Colonna, in *Geography*, a town of European Turkey in Dalmatia; 24 miles N. of Spalatro.—Alſo, a town of Italy, in the Campagna di Roma; 12 miles from Rome.—Alſo, a cape of Naples, on the E. coaſt of Calabria Ultra. N. lat. 39° 6'. E. long. 17° 26.'

COLONNADE, the name given to any range of inſulated columns. See Portico.

COLONNE, in *Geography*, a town of France, in the department of the Jura, and chief place of a canton in the diſtrict of Poligny; 2 leagues W.N.W. of Poligny.

COLONNI, a cape on the coaſt of the Morea, in the Mediterranean. N. lat. 37° 32'. E. long. 24° 11'.

COLONOSSIS, in *Ancient Geography*, a place of Aſia, in Lycaonia.

COLONSAY, in *Geography*, one of the iſlands of Scotland, called the Hebrides. It belongs to Argyllſhire, and as it is ſeparated from Oranſay, merely by a narrow channel, which is dry at low water, Colonſay and Oranſay may be conſidered but one iſland. Although the eminences of the former cannot correctly be termed mountains, they are high, rugged, and covered with heath. The arable land, which conſiſts of about 3000 acres, produces early and tolerable crops, as the ſoil is light and mixed with ſand along the ſhores; part of this land has lately been converted into paſture, and numbers of black cattle are fed on the two iſles. A monaſtery of Ciſtertian monks formerly flouriſhed in Colonſay, and the remains of the walls of the abbey gave place ſome years paſt to a farm houſe; a priory attached, ſtood in Oranſay, where the ruins ſtill remain, and are conſidered ſuperior to any other religious building in the Hebrides, with the ſingle exception of Icolmkill; there are beſides fragments of ſeveral chapels in Colonſay. The inhabitants make large quantities of kelp from the ſea-weed found on the coaſt; and the banks which ſurround the iſlands produce plenty of fine coral. The population is eſtimated at about 720, and the duke of Argyll is the principal proprietor.

Colonsay, *Little*, an iſland, and one of the Hebrides, ſituated between Gometra and Staffa. There are ſeveral ſpecimens of baſaltic pillars in the Leſſer Colonſay, but it has no other inhabitants than one family who attend a few ſheep.

COLONUM, a place of Greece, in Attica. Here was
a foreſt

a foreſt conſecrated to the Eumenides. Sophocles, according to Suidas, was born in this place.

COLONUS, an huſbandman, or villager, who was bound to pay yearly a certain tribute, or at certain times of the year, to plow ſome part of the lord's land; and from hence comes the word *clown*, who is called by the Dutch *boor*.

COLONY, Colonia, is properly a number of perſons of all ſexes and conditions, tranſported into a remote province, with a view of remaining there, and for the purpoſe of cultivating and inhabiting it; but among commercial nations, the term is uſed in a larger but leſs proper ſenſe, and applied to the temporary reſidence of merchants and agents in another country. The word colony originally ſignified no more than a *farm*, i. e. the habitation of a peaſant, *colonus*, with the quantity of land ſufficient for the ſupport of his family; "quantum colonus unus arare poterat." It is derived from the Latin word *colo*, I till or cultivate; hence *colonus*, a huſbandman, and *colonia*, a body of farmers, ſent to cultivate the ground in a diſtant country, and, by metonymy, the place itſelf. From the Latin the word has paſſed, with ſcarcely any alteration, into the modern languages of the weſt of Europe.

We may diſtinguiſh, generally, four kinds of colonies; *viz.* 1. Thoſe that ſerve to eaſe or diſcharge the inhabitants of a country, where the people are become too numerous, ſo that they cannot any longer conveniently ſubſiſt together. 2. Thoſe eſtabliſhed by victorious princes and people, in the middle of vanquiſhed nations, to keep them in awe and obedience. 3. Thoſe that are formed by emigrants, driven from their native country by oppreſſion and perſecution to ſeek a foreign ſettlement, and to ſubſiſt firſt by agriculture, and afterwards by commerce. 4. Thoſe that may be called "colonies of commerce;" becauſe trade is the ſole occaſion and object of them.

To the *firſt* claſs we may refer the colonization which took place in the earlier ages of the world, and which ſerved to diſſeminate the human race, firſt through the various regions of the eaſt, and afterwards through other more remote parts of the globe. At this early period colonization was of courſe more frequent than it is at preſent. The increaſe of a tribe beyond the limits of a comfortable ſubſiſtence upon the lands which were occupied, would be a ſufficient motive for inducing the younger members of the ſociety to remove from the proſpect or actual preſſure of want, to ſome unoccupied territory. Some authors, however, are of opinion that ſoon after the deluge, when the deſcendants of Noah became numerous, a diviſion of the ancient continent and its adjacent iſlands was made, probably by lot, among the heads of the ſeveral families. This opinion ſeems to be in ſome meaſure ſupported by the authority of Moſes, who ſays, (Gen. x.) on mentioning the children of Eber, that the name of one of them was "Peleg" (diviſion), for in his days was the earth divided." (See Dispersion.) However this be, the gradual extenſion of the habitations of mankind muſt have correſponded with their increaſe; and it ſeems to have been unreſtrained by claims made upon the uncultivated ſpots. But this unlimited right of diſperſion has long ſince ceaſed in moſt parts of the world; and hence it has become neceſſary for coloniſts, who ſeek new ſcenes for their labours, either to unite with the natives as friends, or to ſubdue them by conqueſt, if the colony is founded upon hoſtile principles. At a ſubſequent period, the different ſtates of ancient Greece, ſuch were Athens, Sparta, Corinth, and Argos, poſſeſſed territories of very limited extent; and the increaſe of population gave riſe to various emigrations from all thoſe ſtates. The colonies of the Dorians reſorted chiefly to Italy and Sicily, which, in the times preceding the foundation of Rome, were inhabited by barbarous and uncivilized nations; thoſe of the Ionians and Eolians, the two other great tribes of the Greeks, to Aſia Minor and the iſlands of the Ægean ſea, the inhabitants of which ſeem at that time to have been pretty much in the ſame ſtate as thoſe of Sicily and Italy. The emigrations now mentioned, and ſome others of a ſimilar nature, were undertaken by private individuals, with no authority from the government; and as they were generally directed towards diſtant and tranſmarine ſettlements, they retained but a ſlight connection with their original countries. The parent ſtate, indeed, conſidered the colony as a child, at all times entitled to great favour and aſſiſtance, and owing in return much gratitude and reſpect; but, moreover, conſidered it as an emancipated child over whom no direct authority or juriſdiction was claimed. The colony ſettled its own form of government, enacted its own laws, elected its own magiſtrates, and made peace or war with its neighbours as an independent ſtate, which had no occaſion to wait for the approbation or conſent of the parent city. The coloniſts, indeed, remembered the land of their fathers with filial affection and reſpect; they honoured its gods, by offerings of firſt-fruits to their temples; they retained a predilection for its cuſtoms and laws, as well as its religion and language; they yielded to its citizens the place of diſtinction at public games, and to its prieſts the holy honour of firſt inſpecting the entrails of ſacrifices. In war they generally followed the fortunes of the metropolis, as allies upon equal terms; but as they were perfectly independent, received no protection from her, and often equalled her in reſources, they always refuſed to come forward as auxiliaries, when unfair terms were propoſed. Thus, the Sicilian colonies refuſed to admit an Athenian army into their territories, for the purpoſe of reſting, on an expedition; and, in the Perſian war, the republic of Syracuſe, when intreated by the Lacedæmonians to aid the common cauſe, refuſed to ſend any aſſiſtance, unleſs their chief magiſtrate, Gelon, were allowed to command the united forces. Sometimes the parent country, conſcious of her ſuperiority and ſtrength, attempted to exact from the colonies, as matter of right, the uſual marks of filial attachment. Thus, Corinth was deſpiſed by her colony at Corcyra, for her inferiority of wealth and trade; and ſhe endeavoured to obtain by force, the uſual tokens of remembrance. The coloniſts appealed to Athens, who took their part, and retained them as uſeful allies, eſpecially during the Peloponneſian war. Potidæa, another Corinthian ſettlement, took the part of Athens, until her impolitic tyranny urged it to throw off the yoke, and appeal to Sparta and Corinth. After a long and ſevere ſtruggle, the Athenians were ſucceſsful; ſent new colonies to occupy the confiſcated and vacant lands; continued their oppreſſive government; and retained their dominion over Potidæa, until the invaſion of Philip. When the progreſs of Cyrus expoſed the Aſiatic colonies of Greece to extreme danger, they in vain applied to Sparta for aſſiſtance; and, being ſoon conquered by the Perſian monarch, they remained in ſubjection, until the victories of Plateæ and Mycale reſtored them to freedom; but deſpairing of long maintaining their independence, they formed a ſtrict alliance with Athens, who availed herſelf of the opportunity of a general alarm, to propoſe an univerſal contribution from all her colonies and allies, for the great purpoſe of reſiſting the Perſian power. We might cite many other inſtances to exemplify the independence of the Grecian colonies on the ſtates from which they originated. Nevertheleſs, the benefits in point of civilization reſulting to barbarous countries from colonies of private adventurers, migrating from countries more advanced in the knowledge of thoſe arts which meliorate the condition of human life, have entailed honour on thoſe who imparted them, and claimed returns of reſpect and gratitude from thoſe on whom they were beſtowed. From this mode of colonization, reciprocal advantages have been derived. The natives already in poſſeſſion of the country, to which colonies have migrated, are benefited by the introduction of new arts; while, at the ſame time, the adventurers receive the reward of their knowledge, valour, and conduct, by the ſuperior degree of influence which they acquire beyond what they would have poſſeſſed if they had remained in their own country. Thus individual adventurers, who have fitted out expeditions at their own charge, and conducted colonies to a permanent ſettlement by their own ſkill and valour, have, in ſome memorable inſtances, attained even to ſupreme authority. This ſeems to have been the caſe with regard to the colonies anciently eſtabliſhed by Ægialeus in Sicyon, by Inachus in Argos, by Cecrops in Attica, by Janus in Italy, and by Cadmus at Thebes in Greece. From the veneration in which the memory of theſe adventurers, who were moſtly of Egyptian origin, were held, it is evident that they had imported into the countries where they ſettled great and important improvements. The great literary renown which Athens acquired in progreſs of time has rendered us better acquainted with its early hiſtory; ſo that we can form ſome idea of its primitive laws. The regulation of the connexion between the ſexes is recorded as being due to Cecrops; from whence ſome etymologiſts, as Euſtathius, deduce the origin of the appellation διφυὴς, by which he was diſtinguiſhed. The collection of the inhabitants into towns and villages, is ſaid to have been an improvement of his immediate ſucceſſors, who, it is probable, alſo introduced the regulation of local juriſdictions, and the diviſion of the land in property among the then exiſting heads of families, to be inherited by their deſcendants. This ſeems to be, in fact, the main foundation of perfect civilization, by introducing this inequality of condition, as ſome of the families increaſed or proſpered more than others, which, notwithſtanding the reveries of ſome ſpeculative politicians, is abſolutely neceſſary to civilized life. This mode of colonization is ſeldom attempted in more modern times, becauſe the maritime nations of Europe have laid claim to all heathen lands which their ſubjects diſcovered, and have prevented even their own ſubjects from endeavouring to ameliorate the condition of theſe countries, by attempting the formation of independent Chriſtian ſtates. The Jeſuits had, indeed, formed a conſiderable eſtabliſhment for the improvement of the natives in South America; but it gave umbrage to the Portugueſe government, and the neglect of military affairs rendered the overthrow an eaſy undertaking. The Moravian brethren have ſimilar ſettlements in the moſt northern parts of America and Europe, where the inhoſpitality of the climate is ſuch, that the country is not worth contending for. The eſtabliſhment of the Macedonian dynaſties in Aſia and Egypt; and, in later times, that of the northern tribes in the ſouthern parts of Europe and of Aſia, are ſignal examples of this mode of colonization. It is notorious, that it was for the eſtabliſhment of colonies, referred to the firſt claſs abovementioned, that, during the declenſion of the Roman republic, thoſe torrents of barbarous nations, iſſuing, for the generality, out of the north, over-ran the Gauls, Italy, and the other ſouthern parts of Europe; and, after ſeveral bloody battles, divided it with the ancient inhabitants, and blended their own habits and manners with thoſe of the nations which they ſubdued, or in which they obtained either temporary or permanent ſettlements.

To the *ſecond* claſs of colonies belong thoſe of a military nature, which ſerved as guards or garriſons, for the maintenance of a conquered country. The Romans recurred to this mode of colonization more frequently than any other nation; and added, to the original motive, that of providing retreats for the aged and worn-out ſoldiers; as alſo for the ſettlement of the poorer claſſes of Roman citizens. Nor were the intereſts of the rich forgotten, in the eſtabliſhment of Roman colonies. The ſpirit of the Roman laws having reſtrained the mercantile claſſes to their proper rank in ſociety, the capital accumulated by their commanders, during the long continued and widely extended ſucceſſes of the Roman republic, was of courſe inveſted in land. The extent of Italy was too ſmall for the capital, thrown, by this means, into agriculture; and the capitaliſts were therefore obliged to ſeek new lands, on which it might be employed. It appears that the eaſtern ſhores of the Mediterranean ſea were, at the time of their falling under the Roman dominion, in the higheſt poſſible ſtate of cultivation. The provinces ſeated on theſe ſhores, were, therefore, the ſcenes of oppreſſion rather than of improvement, and the plunder, accumulated there, was transferred to Gaul, and other weſtern provinces, to be employed in the purchaſe and improvement of land, or in loans to thoſe who reſided there. The high rate of intereſt allowed by the Roman laws, made it alſo far better to employ money in loans than in commercial ſpeculations, which cannot be ſuppoſed, in the reſtricted and degraded ſtate of Roman commerce, to have yielded the ſame profit as the former. Seneca, the philoſopher, is ſaid to have had, at the time of his death, no leſs than 600,000 *l.* ſterling due to him from the coloniſts in Britain; the ſudden calling in of which produced a rebellion. Beſides, Rome, like moſt of the other ancient republics, was originally founded upon an Agrarian law, which divided the public territory in a certain proportion, among the different citizens who compoſed the ſtate. The courſe of human affairs, by marriage, by ſucceſſion, and by alienation, neceſſarily deranged this original diviſion, and frequently threw the lands, which had been allotted for the maintenance of many different families, into the poſſeſſion of a ſingle perſon. To remedy this diſorder, a law was made reſtricting the quantity of land which any citizen could poſſeſs to 500 jugera, or about 350 Engliſh acres. This law, however, was neglected or evaded, and the inequality of fortunes went on continually increaſing. The greater part of the citizens had no land, and without it the manners and cuſtoms of thoſe times rendered it difficult for a freeman to maintain his independency. The people, therefore, became clamorous to get land, and the rich and great, we may readily imagine, were determined not to give them any part of theirs. To ſatisfy the unquiet and clamorous people, it was frequently propoſed to ſend out a new colony. Accordingly, Rome aſſigned them lands, generally in the conquered provinces of Italy, where, being within the dominions of the republic, they could never form any independent ſtate; but were, at beſt, merely a ſort of corporation, which, though it had the power of enacting by-laws for its own government, was at all times ſubject to the correction, juriſdiction, and legiſlative authority of the mother city. The ſending out of a colony of this kind, not only gave ſome ſatisfaction to the people, but often eſtabliſhed a ſort of garriſon, too, in a newly conquered province, of which the obedience might otherwiſe have been doubtful and precarious. Some of theſe colonies were of a civil, and others of a military nature. In their manners and internal policy, the colonies formed a perfect repreſentation of their great parent; and they were ſoon endeared to the natives by the ties of friendſhip and alliance; they effectually diffuſed a reverence for the Roman name, and a deſire, which was ſeldom diſappointed, of ſharing, in due time, its honours and advantages. A Roman colony, whether we conſider the nature of the eſtabliſhment itſelf, or the motives for making it, was altogether different from a Greek one. The words, accordingly, which, in the original languages, denote thoſe different eſtabliſhments, have very different meanings. The Latin word, *colonia*, ſignifies ſimply a plantation. The Greek word *αποικια*, on the contrary, ſignifies a ſeparation of dwelling, a departure from home, or a going out of the houſe. In conformity to this diſtinction of names, we may obſerve, that the colonial ſettlements of the Greeks were planted in diſtant countries, and amongſt barbarous tribes. They were eſtabliſhed, not in Greece, or in the ſtates immediately in the neighbourhood, which had already been well peopled, but in Gaul, Sicily, and the ſouth of Italy; in Cyrene and Egypt; in Illyria and Aſia Minor. The Roman colonies, on the other hand, were at firſt planted in the immediate vicinity of Rome. During the ſecond Punic war, the city was ſurrounded by no fewer than 30 eſtabliſhments of this kind; which ſerved as ſo many garriſons or advanced poſts for her defence. Ancient authors mention no leſs than 164 colonies ſettled in Italy, from the foundation of Rome to the death of Auguſtus; whereas thoſe planted in all the provinces were only 199. From this conſideration it appears, that the Italian colonies were materially different in their conſtitution and uſes from the colonies of the provinces. The emigrations from Rome to the conquered towns and lands of Italy, and afterwards of the foreign provinces, were the operations of war and plunder. Whenever an Agrarian diviſion of conquered territory was proclaimed, the diſcontented citizens preſented themſelves in a body; and if a ſufficient number did not offer to form a legion for retaining the conqueſt, which they called a colony, the deficiency was ſupplied from all the tribes by lot. As this ſyſtem of conquering policy was effected ſlowly, until the whole of Italy had been ſubdued no emigration ever took place to any tranſmarine, or tranſalpine countries. Among the Romans there were two kinds of colonies; thoſe ſent by the ſenate, and thoſe that were military, conſiſting of old ſoldiers, broken and diſabled by the fatigues of war, who were thus provided with lands, as the reward of their ſervices. The colonies ſent by the ſenate were either Roman or Latin, *i. e.* they were compoſed of Roman or Latin citizens. The colonies of Roman citizens had the right of ſuffrages, and could reclaim the rights of citizens whenever they choſe to remove to the capital. The Latin coloniſts loſt their rights for ever, nor had they any right of ſuffrages without an expreſs permiſſion. According to Ulpian (lib. i. D. de Cens.), there were other colonies, which had little more than the name; only enjoying what they called *jus Italicum*, *i. e.* they were free from the tribute and taxes paid by the provinces; ſuch were the colonies of Tyre, Berytus, Heliopolis, Palmyra, &c. Between all the Roman colonies and the metropolis, there ſubſiſted the cloſeſt connexion. The form of colonial government was modelled upon that of Rome. The laws, if not changed at once, were gradually moulded by the ſpirit of the Roman juriſprudence; the officers were almoſt all ſent from the capital; the mandates of the republic were more promptly obeyed in the provinces than in the city itſelf;—in a word, the eſtabliſhments which have been called colonies, and, compared to thoſe of modern times, or of the Greeks, were military ſtations; garriſons, placed in conquered countries; advanced poſts of a great army, of which the commander in chief held his head quarters in Rome, and occaſionally made a progreſs through the different cantonments. From theſe ſettlements taxes were levied, according to a cenſus; and, after paying the expences of their own government, they tranſmitted a revenue to the Roman treaſury. Men were raiſed for the Roman army according to a muſter-roll. When the grandeur of the Roman name extended acroſs the ocean and the Alps, the rights of citizenſhip became valuable, as the title to power, honours, and plunder. The allies, or colonial and provincial ſettlements of Italy, then demanded the communication of this privilege; and the refuſal produced that "Social war," which may be juſtly deemed the end of the regular republican conſtitution. In conſequence of the Julian law, which terminated this war, and of other laws afterwards paſſed, all the ſtates of Italy, whether allies, colonies, or prefectures, obtained the full rights of Roman citizens. Until the year U.C. 640, no colony but one, which never flouriſhed, had been planted beyond the confines of Italy. The military colonies, introduced by Sylla, and much favoured by Auguſtus, were remarkable only for a form of government more entirely military than that of the other ſettlements. All were equally ſubordinate to the central government, and equally obedient to its decrees.

The firſt foreign colony which the Romans planted was in Carthage, A.U.C. 710, when Julius Cæſar formed the plan of reſtoring that deſerted city by means of a colonial eſtabliſhment. The firſt colony planted in Italy was that of Cænnia, A.U.C. 4. The practice of ſending Roman colonies to the provinces, where they did not enjoy all the privileges of the Italian coloniſts, was very common after the experiment of Julius Cæſar. He himſelf tranſplanted 80,000 citizens in this manner. (Sueton. in Jul. Cæſ. c. 42.) After the time of Auguſtus, who planted 28 colonies in Italy (Suet. in Octav. c. 46.), the cuſtom of planting Italian colonies ſeems to have been abandoned. His ſucceſſors did not plant ſo many as 20; and preferred forming thoſe ſettlements beyond ſeas. Livy does not even mention a tranſmarine or tranſalpine colony; although he conſtantly relates the foundation of thoſe in Italy. Dacia and Britain, the moſt difficult and inſecure of the Roman conqueſts, had only, the former four, and the latter five, Roman colonies. Twenty-five colonies were ſettled in Spain; and Africa, the moſt peaceable of all the Roman poſſeſſions long before the downfal of the commonwealth, received, after the uſurpation of Julius Cæſar, no leſs than 57 colonies, excluſive of Egypt. From theſe circumſtances we may be led to conclude, that the Italian eſtabliſhments were founded with different views, and in a different age of the Roman hiſtory, from the ſettlements in the provinces.

M. Vaillant has filled a volume in folio with medals ſtruck by the ſeveral colonies, in honour of the emperors who founded them. The ordinary ſymbol they engraved on their medals was either an eagle, as when the veteran legions were diſtributed in the colonies; or a labourer holding a plough drawn by a pair of oxen, as when the colony conſiſted of ordinary inhabitants. On all the medals are ſeen the names of the Decemviri, who held the ſame rank, and had the ſame authority there as the conſuls had at Rome.

In the political relations of the Roman ſettlements with their parent city, there is ſome reſemblance to the political relations of modern colonies with their mother countries. But in the policy of a ſtate ſo neglectful of every thing, except war, we cannot expect to find any parallel to thoſe commercial views, by which the plantation of modern colonies has been undertaken, and their connexion with the European governments maintained. The objects of the Romans, in planting their colonies, were conqueſt and plunder; ſo that detachments of emigrants incorporated with, and governed, the old poſſeſſors of the ſoil. In modern times the chief objects have been trade and agriculture; the moſt important ſettlements have been made in deſert countries, or diſtricts, whoſe ancient inhabitants were extirpated by the firſt ſettlers. In this reſpect then, the Roman colonies rather bear a reſemblance to the Aſiatic eſtabliſhments of modern Europe; but they differ from theſe too, in the ſtructure of their government. The conſtitution of the Italian colonies was formed upon the Roman model, and varied with its changes. The provincial governments of Hindooſtan, and the iſlands of the Indian ocean, very little reſemble thoſe of their European maſters, and are rather allied to the ſpirit of the oriental legiſlation. The provincial governments of the Roman tranſmarine territories bore, in every reſpect, the ſame kind of relation to the metropolis, which the Eaſt Indian eſtabliſhments do to the ſtates of Europe. The inhabitants retained, in a great degree, their own laws; they were ruled and oppreſſed by a Roman magiſtrate, and an army, compoſed partly of Roman, partly of native troops; their country was the ſcene of every criminal exceſs in politics and manners, and the ſource of large ſupplies to the plunderers of the world.

The ſpecies of colonies now deſcribed is not reſtricted to the Romans, but it has been adopted by almoſt every nation, both ancient and modern, with very little variation. To it we may refer the eſtabliſhment of the Normans in England, and of the Engliſh in Ireland. In a ſtill later period, the Portugueſe and Dutch have eſtabliſhed themſelves in India; but the Engliſh Eaſt India company have, on the contrary, repreſſed, as far as poſſible, the colonization of the countries they poſſeſs there, as theſe directors obſerve that "the energy of the European character becomes obliterated in the courſe of a few generations."

The commerce of Carthage, together with her extenſive continental poſſeſſions, enabled her to provide for her increaſing population at home. The want of an outlet for inhabitants formed no part of the motives that induced the Carthaginians to ſettle foreign colonies. Their colonial eſtabliſhments, indeed, were moſt probably founded in the ſame manner with the tranſmarine and tranſalpine provinces of the Romans;—conquered countries, retained in ſubjection, from ambition and pride, by means of a Carthaginian governor, and a few followers, prompted by idleneſs, or the love of change, or the deſire of diſtinction to follow in his retinue. However, the relations of the new eſtabliſhments with the mother country were different, in ſeveral reſpects, from the relations which connected the diſtant parts of the Roman dominions with the metropolis. The Carthaginian colonies were, in reality, trading correſpondents to the mother country; and ſhould have found a place under the 4th claſs of colonies rather than here, if they had not been immediately connected with the Roman. It is probable that the Carthaginians received the ſurplus of the rude produce of Sicily, Sardinia, and Spain, which Africa did not yield, and exported thither thoſe manufactures, which would naturally be raiſed in a country fully peopled, and long habituated to traffic. From the ſuperiority of their navigation too, the ſkill of the Carthaginian merchants, their connexions long eſtabliſhed with the Levant, more particularly with the great emporiums of the Eaſt, Tyre and Smyrna, and from the greater trading capitals of thoſe rich merchants; they would moſt likely furniſh the colonies or provinces with Aſiatic commodities, of which Carthage would be the natural entrepôt for the countries to the weſt of the Mediterranean. Hiſtory has preſerved two treaties of commerce and navigation between the Carthaginians and Romans, conceived in the true ſpirit of the modern colonial policy; for which ſee Polyb. l. iii. c. 22. or Brougham's Colonial Policy, &c. vol. i. p. 21, &c.

In this connection we might mention another ſpecies of external colonies, produced by the diſpoſſeſſion of weaker ſtates by thoſe who are ſtronger, in order to extend their borders, or to poſſeſs ſome advantageous ſituations for trade, or for war. The bigotry of the Europeans, at the time of the diſcovery of the Weſt Indies, led them to look upon the natives of thoſe countries in a very unfavourable and contemptuous light, on account of their being heathens and idolaters, and made them heedleſs as to the meaſures they adopted for their own ſecurity, ſo that they could but obtain the object of their wiſhes. The great diſproportion alſo in the numbers of the invaders and of the natives, in ſome meaſure, impelled the Europeans to adopt the moſt ſevere methods, to perpetuate the terror which the natives had originally manifeſted at the effects of their fire-arms. The conſequence of thoſe ſeverities was, that the natives of moſt of the iſlands were ſoon exterminated, except in ſome very ſmall ones which the Europeans left unnoticed. On the continent, however, the natives ſtill exiſt, as they have there ſufficient ſpace to retire from the neighbourhood of their viſitors.

To the *third* claſs belong thoſe colonies that have been formed by refugees from countries, in which they were oppreſſed or perſecuted. Thus the emigrants, who fled from the religious broils in which France, the Low Countries, and Germany have been involved, found ſafety in England, and introduced many of thoſe manufactures and arts, which have contributed to the commercial ſuperiority of Great Britain. Norwich, Canterbury, and even ſome of the moſt populous diſtricts of the metropolis, have owed the induſtry and productions of their inhabitants to theſe colonies; and, in like manner, part of Pembrokeſhire, in South Wales, has been peopled by a colony from Flanders. The colonies of North America were originally planted by men who had quitted their native country, either from a love of civil and religious liberty; or from a deſire to better their fortunes, by laying out a ſmall capital in the improvement of land; or from the neceſſity of finding employment in a country where labour bore a high price. Anxious only to live in peace and freedom, with a competency for themſelves and their families; theſe men centered all their views in the ſpot to which they removed their fortunes and perſons; they gave up for ever the thoughts of returning to the countries which they left behind them; and transferred to their new homes all thoſe ties which had formerly bound them to Europe. The woods of the northern continent were cleared by men of ſmall capital content with a living profit, attached to the ſoil, which owed its cultivation to their labours, and entertaining no idea of removing from it. By degrees the influence of local attachment binds them to a ſpot, which neceſſity had made the object of their choice; and in proceſs of time the deſire of depoſiting their bones in a country which had received and cheriſhed them, ſucceeded to the obliterated partiality for the place of their birth. The firſt ſettlers of all the colonies of N. America were men of irreproachable characters, though not very enlightened in their views, or poliſhed in their manners. Many of them fled from perſecution; others on account of an honourable poverty; and all of them with their expectations limited to the proſpect of a bare ſubſiſtence in freedom and peace. The greater part of them viewed their emigration beyond the Atlantic, as a taking up of the croſs; and bounded their hopes of riches to the gifts of the ſpirit, and their ambition, to the deſire of a kingdom beyond the grave. A ſet of men more conſcientious in their doings, or ſimple in their manners, never founded any commonwealth. It is, indeed, the peculiar glory of N. America, that, with a very few exceptions, its empire was originally founded in charity and peace. In proceſs of time, however, new emigrants

grants flocked to this extenſive country, as it became more open and improved, whoſe views, principles, and character were very different from thoſe of the firſt ſettlers. Many of them were perſons in very indigent circumſtances; they were of different ſects, or of no perceptible religion at all; and of different nations, though the Engliſh greatly predominated. Some of them were convicts, who after confinement in goals were baniſhed for their crimes; many of them perſons of deſperate fortunes, to whom every place was equally uninviting; or men of notoriouſly abandoned lives, to whom any region was acceptable, that offered them a ſhelter from the vengeance of the law, or the voice of public indignation. But a change of ſcene would naturally produce ſome ſalutary effect upon characters the moſt diſſolute. This mixture of various population was ſoon blended, by the influence of thoſe ſimple manners that are formed by an agricultural life, into one nation of huſbandmen, whoſe character has communicated itſelf, in a great degree, to the moſt profligate of thoſe whom compulſion or deſpair from time to time introduced. While purity of manners was in this way preſerved, that firmneſs of principles in religion and politics was maintained, which had ſo eminently contributed to the eſtabliſhment of the colonies. Sentiments of freedom might find an aſylum in America, when, even in Swiſſerland, it ſhould no longer be lawful to think beyond the rules. Neverthele ſs, the circumſtances of the N. American colonies produced ſome other effects not quite ſo favourable, upon the taſte, and in what, in common converſation, we call the manners of the people. The ſolitary nature of agricultural labour, and the ſecluſion of the huſbandman's reſidence, ſurrounded only by his own family and ſervants, are very inimical to all ſorts of refinement, and to every ornamental accompliſhment; whilſt the ſettlers of the new colonies were occupied with the uſeful, they neglected the agreeable arts of life; and voluntarily threw themſelves back ſome centuries, in moſt branches of civilization, inſtead of proſecuting the improvements of thoſe branches, from the point to which the mother country had brought them at the æra of their emigration. In conſequence of their peculiar circumſtances and occupations, the Americans have always poſſeſſed a numerous, virtuous, and athletic peaſantry; but they have numbered few fine artiſts, or accompliſhed orators; and, indeed, an ingenious writer, to whom we are much indebted in the compilation of this article, proceeds ſo far as to obſerve, with a latitude of expreſſion ſcarcely allowable, that "the word American has never yet (ſo far as I know) been coupled with either poetry, or painting, or muſic." The hiſtory of manners in N. America, ſays this writer, is the general hiſtory of manners in every new community, of which agricultural induſtry forms the baſis. The peculiarities (perhaps accidental), which marked the ſituation and habits of the firſt ſettlers, have likewiſe produced ſome effect upon thoſe of their deſcendants, without in the leaſt modifying their character as an agricultural nation. The love of civil and religious freedom was connected with an anxious attention to all matters of controverſy, whether in politics or in faith; and as the ſettlers were equally incapable of underſtanding either, ſo they were chiefly captivated with the more abſtruſe of the two ſciences; and affected great depth in the things appertaining to grace, ſpirit, incarnation, and all the ſublime myſteries of the Chriſtian diſpenſation. Theſe fruitleſs ſpeculations were the only literary inheritance which they tranſmitted to their children. But although they had left the old world for the ſake of liberty of conſcience, they too ſoon manifeſted what they underſtood by liberty of conſcience. By that term they meant (like many other advocates of liberty) the propagation of their own peculiar tenets; and they ſhewed that they only wanted the power to propagate their creed (like their European oppreſſors) by that method of mental perſuaſion which conſiſts in burning the body. They allowed every man entire liberty of conſcience, provided that he uſed that liberty in adopting their own ſtandard of faith. Accordingly, while in Old England the ſpirit of fanaticiſm was operating the downfal of government, and mingling itſelf with every purſuit of the age, to the univerſal debaſement of manners and ſentiment; in New England, the heterodox were perſecuted by the impulſes of the inward light; or parties were formed, and armies marſhalled, and millions led by the ſubtle principles of a metaphyſical theology. But the Falklands and Sydneys had no parallels to temper the unclaſſical rage of the American bigots; and even the Cromwells and Bradſhaws found but poor repreſentatives in the ſtupid fanatics of Boſton and Salem. Long after the mother country had relinquiſhed, for ever, the acts of perſecution, they found votaries in the conſtituted authorities of the colonies; and the northern ſtates at the end of the 17th century, afforded the diſgraceful example of that ſpiritual tyranny, from which their territories had originally ſerved as an aſylum. The century, which has juſt elapſed, moderated this odious ſpirit; but to this day, the northern ſtates are chiefly diſtinguiſhed from the others, by a taint of religious bigotry;—as the character of the middle ſtates is modified by the greater mixture of different nations, which have contributed to people them;—and that of the ſouthern provinces, by the admixture of negro ſlaves. In the middle ſtates, the mercantile ſpirit has gained more ground than in any of the reſt: the diverſities of race have rendered the ſentiments of patriotiſm, and the love of liberty, leſs ardent; while the variety of religions has prevented the introduction of that fanaticiſm, of which we have traced the effects in the north. In the ſouthern ſtates the contraſt of ſervitude has mingled an ariſtocratical ſpirit with the manners of ſimple huſbandmen; and the climate, by promoting the growth of an article, belonging to the claſs of luxuries, has given riſe to a ſpecies of agriculture bordering upon the great gains and uncertain proſpects of commercial ſpeculation. In all the colonies, however, of the northern continent, a reſpectable national character may be ſaid to prevail. If their intercourſe with the mother country would have had no tendency to civilize or adorn her, it could certainly have in no degree contributed to the corruption, either of her moral or political habits; and the moſt rapid interchange of population could only have tended to embelliſh the American ſociety and to vary its accompliſhments, while it rendered a ſervice to the Britiſh manners, by the intercourſe of a more ſimple and virtuous people. Unfortunately, the very circumſtances which neceſſarily laid the foundation of thoſe habits and that national character inſulated the population of the country from that of the old world. The colonies were ſtationary for the ſame reaſon that they were reſpectable; and the circulation of its inhabitants, with all its effects upon both parts of the empire, has been maintained and accelerated in other colonies, placed in circumſtances which rendered thoſe effects unfavourable, at leaſt to the mother country. For the change that has taken place with regard to the principles and manners, the religion and liberty of the ſeveral colonies of N. America, ſince they have acquired a new government, and been formed into the *United States*; ſee this article, and alſo an account of the ſeveral ſtates themſelves under their appropriate titles.

The *fourth* claſs of colonies comprehends thoſe that are denominated *commercial*, and which have been eſtabliſhed at different periods, by the Engliſh, Dutch, French, Spaniards, Portugueſe, and other nations; and which are ſtill maintained, in a greater or leſs degree, with a view of keeping up a regular intercourſe with the natives, or of cultivating the ground, by planting ſugar-canes, rice, indigo, tobacco, cotton and other commodities. See CHARTER *Governments*.

The principal of this kind of colonies are thoſe that have been eſtabliſhed in North and South America; particularly Peru, Mexico, Canada, Virginia, New England, Carolina, Louiſiana, Hudſon's bay, the Antilles iſlands, Jamaica, Domingo, and the other iſlands of the Weſt Indies: alſo, in Africa, Madagaſcar, the cape of Good Hope, cape Verd, and its iſlands, and all the coaſts extended thence as far as to the Red ſea; and likewiſe in Aſia, the famous Batavia of the Dutch, and Ceylon; Goa, Diu, of the Portugueſe; and ſome other leſs conſiderable places of the Engliſh, French, Danes, and other nations, in the Eaſt and Weſt Indies.

The eſtabliſhment of the European colonies in America and the Weſt Indies, if we except thoſe of North America to which we have already alluded, did not originate in neceſſity; but it was the reſult of ambitious and intereſted views. The Dutch, indeed, may plead in favour of the extenſion of their own ſettlements and commerce, that the colonial ſyſtem is neceſſary to their ſubſiſtence and proſperity. Their territory is ſmall, and generally undiſtinguiſhed by its fertility; and therefore they have recurred for the neceſſaries of life to the ports of more fruitful and leſs populous countries. Habituated to induſtry, and excelling other nations in nautical ſkill, inſtead of confining themſelves to the exchange of their own manufactures for the rude produce, or the manufactures of other nations, they employed themſelves in circulating the produce and manufactures of other countries; and, more attentive to this occupation than to the arts of working up the produce which they imported or raiſed, they became a nation, not of farmers or manufacturers, but of fiſhermen, merchants, and ſailors. Conſtrained by other circumſtances belonging to their country, when compared with other nations, they were obliged, by the diſadvantages of their ſituation and the oppreſſion of their Spaniſh maſters, to put forth every poſſible effort of fortitude and perſeverance. By induſtry, frugality, and labour, theſe people not only ſoon outſtripped all their contemporaries in riches and naval ſkill, but amaſſed a much greater ſhare of wealth, and gained a more formidable influence over the deſtinies of the world, than ſo ſmall a tribe ever acquired in any age. Their ſteady attachment to the principles of freedom and toleration ſerved as a concurring mean of their advancement and proſperity. The neceſſary conſequence of extenſive opulence, acquired by a people who have not a proportionably great territory, is, that the means of advantageouſly employing their capital will become gradually more and more difficult; the profits of its employment more confined, and its accumulation more ſlow. Such a people will naturally ſeek ſome new opening for ſettlement or commerce, by acquiring territory in diſtant quarters of the globe. Should they fail in this way, the overflowing wealth of the nation muſt infallibly emigrate, as it were, into the ſervice of foreign countries, where the profits are greater than they are at home. Hence we find that the Dutch became, in a ſenſe, the brokers of Europe; and that they advanced ſums to foreign ſtates and their ſubjects, which were enormous. It is probable, ſays an ingenious and accurate writer, (Mr. Brougham), that the Dutch have frequently been creditors, at one time, to the amount of much more than 300 millions ſterling to their own government, and to foreign ſtates, of which we may reckon two-thirds in foreign loan: an immenſe ſum of ſurplus capital to have been accumulated by a nation poſſeſſed of no greater territory than the principality of Wales, without any good harbours, or any natural produce fit for exportation; a territory, 120 times leſs extenſive than the European dominions of Ruſſia, which is conſtantly running in debt with all the world! A people poſſeſſed of ſuch an overflowing capital, was, of all people, that which ſtood the moſt in need of foreign colonies; and this for two reaſons:—in order to obtain a new opening, of whatever kind, for the ſtock which could not be employed at home, or which, for want of this employment, was drawn into the ſervice of foreigners; and in order to ſecure the poſſeſſion of this opening at all times under its own command. The acquiſition of colonial poſſeſſions is the only means by which the United Provinces can poſſibly avoid the decline of its mercantile proſperity and political importance, and ſupply their natural deficiency of territory, the cauſe of their inſtability, as it was the cauſe of their riſe and progreſs. An opening for capital may then be obtained always under the command of the ſtate. The poſſeſſion of colonies muſt be as advantageous to the community of the United Provinces, as agreeable to individual capitaliſts and adventurers. It has certainly preſerved the commercial exiſtence of the republic for a long ſeries of years, and enabled this ancient ſtate to retain its place among the great powers of Europe inſtead of being ſwallowed up by its neighbours, or reduced to a few fiſhing villages. No nation of Europe depends ſo much upon colonial policy as Holland; nor is any ſo liable to be affected, in every member, by the ſlighteſt variation of colonial affairs. See *Dutch Eaſt India* COMPANY and *Dutch Weſt India* COMPANY. The whole return of the Dutch colonies, above 20 years ago, was calculated (ſays Mr. Brougham) at 24 millions of florins—exported in 150 veſſels, navigated by 1000 men, and paying, in freight, 4 millions 5 hundred thouſand florins—in commiſſion and inſurance, 2½ millions. The Dutch merchants exported to them merchandize (including negro ſlaves) to the value of 6 millions. The moſt unfortunate circumſtance in the colonial policy of the Dutch has always been their bad treatment of ſlaves. (See NEGROES and SLAVES.) The colonies of Holland have alſo ſuffered, in general, from the importation of negroes being too ſcanty to anſwer the demands of the proprietors. Upon the whole, it is obſerved by the writer ſo often cited in this article, that in no country is there ſo great a demand for new colonies as in the United Provinces. To no part of Europe are colonial poſſeſſions ſo valuable; none would be ſo irretrievably ruined by their loſs; none would be ſo much benefited by their extenſion.

The views of Spain in its colonial eſtabliſhments were directed from the beginning of their connection with America to the pecuniary advantages likely to reſult from them. In conſequence of the repreſentation of Columbus, the council of Caſtile determined to take poſſeſſion of countries of which the inhabitants were incapable of defending themſelves. The pious purpoſe of converting them to Chriſtianity ſanctified the injuſtice of the project. But the hope of finding treaſures of gold there was the ſole motive which prompted them to undertake it; and to give this motive the greater weight, it was propoſed by Columbus, that the half of all the gold and ſilver which might be found there ſhould belong to the crown. This propoſal was approved of by the council. The tax was eaſily paid whilſt the defenceleſs natives were plundered; but as they were ſtripped of all that they had, which, in St. Domingo, and the other countries diſcovered by Columbus, was completely done in ſix or eight years; and when it became neceſſary to dig for it in the mines, it was impoſſible to pay the tax. The rigorous exaction of it occaſioned firſt the total abandonment of the mines of St. Domingo, which have never been wrought ſince; and it was afterwards reduced, by ſucceſſive defalcations, to a 20th part of the produce of the gold mines. The tax upon ſilver, which was a fifth of the groſs produce, was reduced to a tenth in the courſe of the laſt century. All the other enterpriſes of the Spaniards in the New World, ſubſequent to thoſe of Columbus, ſeem to have been prompted by the ſame motive. It was the ſacred thirſt of gold that carried Oieda, Nicueſſa, and Vaſco Nugnes de Balboa, to the iſthmus of Darien, that carried Cortez to Mexico, and Almagro and Pizarro to Chili and Peru. Impelled by the proſpect of immenſe gain to eſtabliſh colonies in America, the firſt object of the Spaniſh monarchs was to ſecure the productions of theſe colonies to the parent ſtate, by an abſolute prohibition of any intercourſe with foreign nations. They took poſſeſſion of America by right of conqueſt; and, having reaſon to apprehend the loſs of their infant ſettlements, on account of their feebleneſs, their extent, and the reluctance with which the vanquiſhed nations ſubmitted to their dominion, they guarded, by every poſſible method, againſt the intruſion of ſtrangers. As their poſſeſſions were extended, the ſpirit of jealouſy and excluſion increaſed; and, in order to their greater ſecurity, a ſyſtem of colonizing was introduced, to which the hiſtory of mankind afforded no parallel. In the ancient world, as we have already ſeen, colonies were of two kinds; either migrations from a country overſtocked with inhabitants, or military detachments, ſtationed as garriſons in a conquered province. The colonies of ſome Greek republics, and the ſwarms of northern barbarians which ſettled in different parts of Europe, were of the firſt kind; and the Roman colonies were of the ſecond kind. In the former, the connection with the mother country quickly ceaſed, and they became independent ſtates; in the latter, the dependence continued, becauſe the ſeparation was not complete. The Spaniſh monarchs, in their American ſettlements, took what was peculiar to each, and ſtudied to unite them. By ſending colonies to regions ſo remote, by eſtabliſhing in each a form of interior policy and adminiſtration, under diſtinct governors, and with peculiar laws, they disjoined them from the mother country. By retaining in their own hands the rights of legiſlation, as well as that of impoſing taxes, together with the power of nominating the perſons who filled every department, civil or military, they ſecured their dependence. At firſt, as we have already obſerved, the precious metals were the only objects that attracted their attention. Afterwards they ſought for ſuch productions of the climate as, from their rarity or value, were of chief demand in the mother country; and they forbade the eſtabliſhment of ſeveral ſpecies of manufacture, that were likely to interfere with thoſe of the mother country. Their clothes, furniture, inſtruments of labour, luxuries, and even a conſiderable part of the proviſions which they conſumed, were imported from Spain. In return, the coloniſts ſupplied the produce of their mines and plantations, which was conveyed only in Spaniſh bottoms. The commercial intercourſe of one colony with another was either abſolutely prohibited, or limited by many jealous reſtrictions. All that America yields flows into the ports of Spain; all that it conſumes muſt iſſue from them. No foreigner can enter its colonies without expreſs permiſſion; no veſſel of any foreign nation is received into their harbours; and the pains of death, with confiſcation of moveables, are denounced againſt every inhabitant who preſumes to trade with them. Thus the colonies are kept in a ſtate of perpetual pupillage; and by the introduction of this commercial dependence, a refinement in policy, of which Spain ſet the firſt example to the European nations, the ſupremacy of the parent ſtate hath been maintained over remote colonies, during 2½ centuries. Several maxims were alſo adopted and enforced with regard to the reſtrictions of ſettlers, the ſtate of property, and the eccleſiaſtical policy of the colonies, which ſerved very much to diſcourage emigration from Europe, and the increaſe of population in America. If we advert to the ſtate of Spain, and compare it with that of Holland, we ſhall ſoon perceive, that the Spaniards, poſſeſſing a country fifteen times more extenſive than Holland, of incalculably greater fertility, enjoying all the benefits of the fineſt climate in the world, ſurrounded with natural barriers of defence, and bleſſed with every advantage of ſituation which can facilitate commercial intercourſe, and yet maintaining not much more than one-fourth of the Dutch population, are evidently independent of colonial poſſeſſions. All the induſtry, ſkill, and capital of the natives, may find ample employment in raiſing, manufacturing, and circulating the produce of the ſoil, or in exchanging the ſuperfluous part of that produce for the commodities which abound in other countries. But, though it would have been ſounder policy in the Spaniſh government to have promoted a ſpirit of induſtry at home, than to have eſtabliſhed diſtant colonies, yet it cannot be denied, that ſhe has received very great benefits from them, and ſuch, in their nature and value, as more than counterbalance the injury they have occaſioned. At the period of their firſt eſtabliſhment, the interior induſtry and manufactures of Spain were ſo proſperous, that, with the product of theſe, ſhe was able both to purchaſe the commodities of the New World, and to anſwer its growing demands. Under the reigns of Ferdinand and Iſabella, and Charles V., Spain was one of the moſt induſtrious countries in Europe. Her manufactures in wool, and flax, and ſilk, were ſo extenſive, as not only to furniſh what was ſufficient for her own conſumption, but to afford a ſurplus for exportation. When a market for them, formerly unknown, and to which ſhe alone had acceſs, opened in America, ſhe had recourſe to her domeſtic ſtore, and found there an abundant ſupply. By this new demand, furniſhing anſwerable employment, the ſpirit of induſtry muſt have been enlivened and encouraged; and the manufacture, population, and wealth of Spain might have gone on increaſing in the ſame proportion with the growth of her colonies. However, by the great and ſudden augmentation of power and revenue, which the poſſeſſion of America brought into Spain, ſober plans of induſtry were overturned, and opulence, rapidly acquired, produced a taſte for what is wild and extravagant, and daring in buſineſs or in action. The genius of Charles V in ſome meaſure counteracted the pernicious influence of this inundation of wealth and of the ſubſequent interruption of it; but under Philip II. its effect, both on the monarch and the people, became conſpicuous. Philip, poſſeſſing an extravagant opinion of his inexhauſtible reſources, and, at the ſame time, an ambition connected with moderate talents, thought himſelf equal to any undertaking. Accordingly he waged open war with the Dutch and Engliſh, encouraged and aided a rebellion in France, conquered Portugal, and maintained armies and garriſons in Italy, Africa, and both the Indies. Thus Spain was drained both of men and of money. Under the weak adminiſtration of his ſucceſſor, Philip III., the vigour of the nation declined, and the bigotry of the monarch expelled near a million of his moſt induſtrious ſubjects; ſo that early in the 17th century, Spain felt ſuch a diminution in the number of her people, that from inability to recruit her armies, ſhe was obliged to contract her operations. Her flouriſhing manufactures were fallen into decay. Her fleets, which had been the terror of all Europe, were ruined. Her extenſive foreign commerce was loſt. Agriculture was neglected, and one of the moſt fertile countries in Europe hardly raiſed what was ſufficient for the ſupport of its own inhabitants. In proportion as the population and manufactures of the parent ſtate declined, the demands of her colonies continued to increaſe. The rage of emigration prevailed, and the ſtrength of the colonies was augmented by exhauſting that of the mother-country. The emigrants depended upon Spain for almoſt every article of neceſſary conſumption. But Spain, thinned of people and deſtitute of induſtry, was unable to ſupply their increaſing demands. She had recourſe to her neighbours; and the manufactures of the Low Countries, of England, of France, and of Italy, which her wants called into exiſtence, or animated with vivacity, furniſhed in abundance whatever ſhe required. In a ſhort time not above one-twentieth part of the commodities exported to America was of Spaniſh growth or fabric. All the reſt was the property of foreign merchants, though entered in the name of Spaniards; ſo that the treaſure of the New World may be ſaid henceforward not to have belonged to Spain. Before it reached Europe, it was anticipated as the price of goods purchaſed from foreigners. Thus the poſſeſſions of Spain in America have not ſerved as a ſource of population and of wealth to her, in the ſame manner as thoſe of other nations. From the cloſe of the 16th century ſhe was unable to ſupply the growing wants of her colonies; and the pernicious effects of this diſproportion between their demands and her capacity of anſwering them, were farther aggravated by the mode in which ſhe endeavoured to regulate the intercourſe between the mother-country and the colonies. Such was the monopoly at which ſhe aimed, and which ſhe wiſhed to maintain, that ſhe did not veſt her trade with her colonies in an excluſive company; a plan which had been adopted by nations more commercial, and at a period when mercantile policy was an object of greater attention, and ought to have been better underſtood. The Dutch gave up the whole trade with their colonies both in the Eaſt and Weſt Indies, to excluſive companies. The Engliſh, French, and Danes, have imitated their example with reſpect to their Eaſt-Indian commerce; and the two former have laid a ſimilar reſtraint upon ſome branches of their trade with the New World. The wit of man cannot, perhaps, deviſe a method for checking the progreſs of induſtry and population in a new colony, more effectual than this. From this error in policy Spain was preſerved, probably by the high ideas which ſhe early formed concerning the riches of the New World. Gold and ſilver were commodities of too high value to veſt a monopoly of them in private hands. The crown retained this alluring branch of commerce; and in order to ſecure it, enjoined the cargo of every ſhip fitted out for America to be inſpected by officers at Seville, and then to receive a licence for the voyage; and on its return, that a report of the commodities which it brought ſhould be made to the ſame board, before it ſhould be permitted to land them. By this regulation all the trade of Spain with the New World centered in the port of Seville, and was brought into a form, in which it has been continued with little variation, almoſt to our own times. See GALEONS and FLOTA.

The trade of Spain with her colonies being thus reſtricted, was conducted on the ſame principles which directed that of an excluſive company; and the whole of it was exported by a few wealthy houſes, formerly in Seville, and ſince the year 1720 in Cadiz; theſe, by combinations eaſily formed, prevent that competition which preſerves commodities at their natural price; and, by acting in concert, to which mutual intereſt prompts them, they may raiſe or lower the value of them at pleaſure. This reſtraint of the American commerce to one port, not only affects its domeſtic ſtate, but limits its foreign operations. In theſe circumſtances, and whilſt the evils reſulting from them found no effectual remedy, Spain, with dominions more extenſive and more opulent than any European ſtate, poſſeſſed neither vigour, nor money, nor induſtry. At length the violence of a great national convulſion rouzed the ſlumbering genius of Spain. As ſoon as the Bourbons acquired poſſeſſion of the throne, it was the firſt object of Philip V. to prohibit the admiſſion of foreign veſſels into any port of Peru and Chili; and a Spaniſh ſquadron was employed to clear the South Sea of intruders, whoſe aid was no longer neceſſary. After the treaty of Utrecht, which terminated the war, new embarraſſments occurred in conſequence of the aſſiento, or contract for ſupplying the Spaniſh colonies with negroes, conveyed to Great Britain, as the price of peace; (See ASSIENTO) and the additional privilege of ſending annually to the fair of Porto-Bello, a ſhip of five hundred tons, laden with European commodities. By the operations that ſucceeded theſe grants, and by the activity of private interlopers, almoſt the whole trade of Spaniſh America was engroſſed by foreigners. Guarda coſtas, and regiſter ſhips were introduced. (See each of theſe articles). Since the reign of Philip V., ſentiments with regard to commerce, more liberal and enlarged, began to ſpread in Spain. At length Charles III. in 1764, appointed packet-boats to be diſpatched on the firſt day of each month, from Corugna to the Havannah or Porto-Rico. From thence letters are conveyed in ſmaller veſſels to Vera-Cruz and Porto-Bello, and tranſmitted by poſt through the kingdoms of Terra Fermé, Granada, Peru, and New Spain. Other packet-boats ſail regularly once in two months, to Rio de la Plata, for the accommodation of the provinces to the eaſt of the Andes. With this new arrangement for conveying ſpeedy and regular intelligence, a ſcheme of extending commerce has been more immediately connected. Each packet boat is a trading veſſel, and is uſed for facilitating the exchange of Spaniſh product, for an equal quantity of that of America. This was ſoon followed by a greater degree of enlargement. In the year 1765, Charles III. laid open the trade to the windward iſlands, Cuba, Hiſpaniola, Porto-Rico, Margarita, and Trinidad, to his ſubjects in every province of Spain. He reduced the duties on goods exported to America, to the moderate tax of ſix in the hundred, on the commodities ſent from Spain. He allowed them to return to any port at pleaſure. This ample privilege was afterwards extended to Louiſiana, and to the provinces of Yucatan and Campeachy. Such have been the benefits experienced from the relaxation of the ancient ſyſtem of commerce between the mother-country and her colonies, that Spain has been induced to permit a more liberal intercourſe of one colony with another. In 1774 Charles III. publiſhed an edict, granting to Peru, New Spain, Guatimala, and Granada, the privilege of a free trade with each other. The towns to which Spain has granted the liberty of trade with any of her colonies, are Cadiz and Seville, for the province of Andaluſia; Alicant and Carthagena, for Valencia and Murcia; Barcelona, for Catalonia and Arragon; Santander, for Caſtile; Corugna, for Galicia; and Gijon, for Aſturias. Theſe are either the ports of chief trade in their reſpective diſtricts, or thoſe moſt conveniently ſituated for the exportation of their reſpective productions. Prior to the allowance of free trade, the duties collected at the Cuſtom-houſe at the Havannah, were computed to be 104,208 peſos annually. During the five years preceding 1774, they roſe at a medium to 308,000 peſos a year. In Yucatan, the duties have riſen from 8,000 to 15,000. In Hiſpaniola, from 2,500 to 5,600. In Porto-Rico, from 1,200 to 7,000. The total value of goods imported from

Cuba into Spain, was reckoned, in 1774, to be 1,500,000 peſos. From another ſtatement, it appears, that the exports to Spaniſh America in 1778, were made in 170 ſhips; were worth about 74 millions of reals vellon, and paid above 3½ millions of duty. The imports from thence, in the ſame year, were made in 130 ſhips, valued at 74½ millions, and paid nearly 3 millions duties. In 1788, the value of the exports had riſen to above 300 millions, and that of the imports to above 804½ millions. The duties upon both exports and imports exceeded 55 millions. This rapid increaſe can be aſcribed to nothing but the effects of the free trade; and notwithſtanding all the clamours raiſed by the Cadiz merchants, we find that this city was the firſt to enjoy the advantage of the change; for the imports of Cadiz from America in 1788, were three-fourths of the whole colonial imports; and the exports of Cadiz thither were conſiderably above two-thirds of the whole colonial exports. Spain has likewiſe directed particular attention to the interior government of her colonies. For an account of the Philippine colony, ſee ACAPULCO and MANILA.

The revenues which Spain derives from America, ariſes from taxes of various kinds, which may be divided into three capital branches. The firſt contains what is paid to the king, as ſovereign of the New World; to this belongs the duty on the gold and ſilver raiſed from the mines, and the tribute exacted from the Indians; the former called "the right of ſigniory," and the latter "the duty of vaſſalage." The ſecond branch comprehends the numerous duties upon commerce, which are very minute and oppreſſive. The third includes what accrues to the king, as head of the church, and adminiſtrator of eccleſiaſtical funds in the New World. In conſequence of this he receives the firſt-fruits, annats, ſpoils, and other ſpiritual revenues, levied by the apoſtolic chamber in Europe; and is entitled likewiſe to the profit accruing from the bull of *Cruzado*, which ſee. The whole amount of the net public revenue of Spain, raiſed in America, is ſtated by Dr. Robertſon as not exceeding a million and a half ſterling. Spain and Portugal are the only European powers which derive a direct revenue from their colonies, as their quota towards defraying the general expence of government. All the advantage, that accrues to other nations from their American dominions, ariſes from the excluſive enjoyment of their trade; but, beſides this, Spain has brought her colonies to contribute towards increaſing the power of the ſtate, and, in return for protection, to bear a proportional ſhare of the common burden. The amount of the Spaniſh revenue, above ſtated, comprehends only the taxes collected there, and is far from being the whole of what accrues to the king from his dominions in the New World. The heavy duties impoſed on the commodities exported from Spain to America, as well as what is paid by thoſe which ſhe ſends home in return; the tax upon negro ſlaves, with which Africa ſupplies the New World, together with ſeveral ſmaller branches of finance, bring larger ſums into the treaſury, the preciſe extent of which Dr. Robertſon cannot pretend to aſcertain. But if the revenue which Spain draws from America be great, the expence of adminiſtration in her colonies bears proportion to it.

The total amount of the public revenue of Spain from America and the Philippines, from the moſt recent information ſtated by Dr. Robertſon, is as follows:

Alcavalas (exciſe) and aduanas (cuſtoms), &c. in peſos fuertes, - - -	2,500,000
Duties on gold and ſilver, - -	3,000,000
Bull of Cruzado, - - -	1,000,000
Tribute of the Indians, - -	2,000,000
By ſale of quickſilver, - -	300,000
Paper exported on the king's account, and ſold in the royal warehouſes, - -	300,000
Stamped paper, tobacco, and other ſmall duties,	1,000,000
Duty on coinage of, at the rate of one real de la Plata, for each mark, - -	300,000
From the trade of Acapulco, and the coaſting trade from province to province, -	500,000
Aſſiento of negroes, - - -	200,000
From the trade of *Mathé*, or herb of Paraguay, formerly monopolized by the Jeſuits, -	500,000
From other revenues formerly belonging to that order, - - - -	400,000
Total	12,000,000
Total in ſterling money	£ 2,700,000
Deduct half, as the expence of adminiſtration, and there remains net free revenue, -	£ 1,350,000

From the above detail, and upon a general view of the ſubject, it appears to be abſurd to deny, that Spain has derived very great benefits from her colonial poſſeſſions. Nevertheleſs, many very enlightened men have maintained, that the downfal of the Spaniſh power has been owing, in a great meaſure, to the extenſion of dominion which followed the diſcovery of America. To this purpoſe an appeal has been made to the authority of Dr. Smith, the well known and much approved author of the "Wealth of Nations." "That the monopoly," he obſerves, "of the trade of populous and thriving colonies is not alone ſufficient to eſtabliſh, or even to maintain, manufactures in any country, the examples of Spain and Portugal ſufficiently demonſtrate. Spain and Portugal were manufacturing countries before they had any conſiderable colonies. Since they had the richeſt and moſt fertile in the world, they have both ceaſed to be ſo." However, Mr. Brougham has remarked, that the tenor of this obſervation is confined to the ſtatement of a fact which cannot be denied, that the period of the decline which the Spaniſh and Portugueſe manufactures have experienced, coincided with the period of the Spaniſh and Portugueſe colonial greatneſs. But the whole argument proceeds upon a view of the ſubject, formerly diſcuſſed, that colonial monopolies in general have been hurtful, from their effects on the wealth of the mother-country. Mr. Brougham has accurately examined this ſubject; and in the proſecution of his inquiry, he has ſhewn, in what manner the proſperity of Spain has been influenced by the diſcovery of America; and he has inveſtigated the queſtion, whether the acquiſition of rich and extenſive colonies can be charged with having cauſed the decline of the mother-country, and whether, in ſhort, any bad conſequence whatever is imputable to this augmentation of empire.

By thoſe who have maintained, that Spain has been materially injured by her colonies, it has been alleged, that by an immoderate extenſion of territory, the Spaniards have been led to the neglect of the territory, which they formerly poſſeſſed. But although Spain, and alſo Portugal, may have ſeverely ſuffered in this reſpect, it is ſeldom, if ever, that, from the nature of colonial power, any ſuch conſequences can ariſe to the mother-country from the poſſeſſion of the moſt widely ſpread colonial dominions. In the caſe of Spain eſpecially, whatever neglect there may have been in the management both of the mother-country and the colonies, the mal-adminiſtration of both thoſe parts of the empire muſt evidently have ariſen from other cauſes beſides their being united under one crown. Farther, the vaſt outlet to population which the Spaniſh colonies afford has been thought by many to be detrimental to the mother-country. They allege that the population of Spain has been drained by the demands and temptations for men which the colonies afford. Our author ſuggeſts a variety of conſiderations that tend to invalidate this objection. The indolent and adventurous, the nobles and ſoldiers of fortune, and men of conſiderable property, were the principal emigrants at the firſt ſettlement of the Spaniſh colonies in America; as conqueſt or plunder, and mining in ſearch of the precious metals were the only modes in which wealth was then ſought. Beſides, the drain of emigration has been chiefly confined to the population of the maritime provinces of Spain; and the whole amount of the emigration, at different periods, cannot be eſtimated very high. It has been ſaid that the rage for emigration to America was ſo much abated in a ſhort time after the diſcovery, chiefly by the ruin of many who flocked thither, that in the year 1550, there were not above 15 thouſand Spaniards in all the New World. From other documents it has been inferred, that the whole amount of thoſe who have emigrated to the Spaniſh colonies, during a period of three centuries, does not exceed 500,000. The drain of the Spaniſh population muſt therefore be wholly inadequate to account for the decline of the Spaniſh reſources, and the ſlow progreſs of the Spaniſh population. It is no leſs chimerical to imagine that the capital which has been drawn to the colonial agriculture and mining, can have impoveriſhed the mother-country in any conſiderable degree, than to ſuppoſe that the colonial emigration can have drained her population: and it is, therefore, to cauſes different from the emigration of inhabitants, and of capitals, that we muſt aſcribe the depopulation, the indolence, and the poverty of Spain. In order to account for the depopulation of Spain we may recur to the ravages of the plague, which, during three years in the middle of the 14th century, carried off two-thirds of the whole population of the peninſula, and which about three centuries afterwards, deſtroyed 200,000 perſons in the ſouthern provinces;—to the deſtruction occaſioned by dearth and famine;—to the cruel and inſane policy of Ferdinand, who, as an expreſſion of gratitude to God for the ſucceſſes of his arms, expelled from his dominions the whole tribe of Iſrael;—to the ſtill more bloody and impolitic meaſures of his ſucceſſor, who, about a century afterwards, drove out all the Mooriſh race;—and to the conſtant perſecutions and rebellions of theſe two claſſes during the interval between the great and general expulſions, which produced the effect of ſuddenly eradicating from the kingdom all the induſtry and ſkill which had raiſed it to ſuch a pitch of opulence and glory. The number of the Jews, who, in the year 1492, were butchered or driven out, is reckoned by ſome authors at 800,000 perſons, by others at 800,000 families; and the number of the Moors driven away by the edict of 1609, cannot be computed at leſs than a million. The beſt informed writers ſtate the loſs to the country at theſe two periods, and intervening intervals, to have amounted to between two and three millions; conſiſting of the moſt uſeful and valuable part of the community. We might enumerate other cauſes of the decline of Spain, ariſing from reſtrictions and impoſts, and a miſerable ſyſtem of law and police, both at home and in the colonies, which operated much more fatally than the acquiſition of colonial dominions, and which, indeed, counteracted any benefit they might otherwiſe have afforded. It is ſurely a proof, ſays Mr. B., that the downfal of a country was not cauſed by its colonial poſſeſſions, but by ſome evil in the national policy common to all its branches, when we find that the æra of adverſity was common to both the contiguous and remote provinces, and that the ſame circumſtances which raiſed up the colonies, and increaſed their beneficial effects upon the wealth of the parent ſtate, have elevated the parent ſtate alſo, reſcued her from inactive obſcurity, and placed her in the career of general improvement, in which her neighbours are engaged in both quarters of the globe.

The Portugueſe, incited by a ſpirit of diſcovery, and by a view to the great profits accruing to the Venetians from their commerce, during the 14th and 15th centuries, made ſeveral attempts, in the courſe of the 15th century, to find out a way by ſea to the countries from which the Moors brought them ivory and gold duſt acroſs the deſart. In proceſs of time they diſcovered the Madeiras, the Canaries, the Azores, the Cape de Verd iſlands, the coaſt of Guinea, that of Loango, Congo, Angola, and the Cape of Good Hope. They alſo extended their views to the Eaſt Indies, and afterwards to America. During the 16th century, the empire of Portugal was more extenſive than any over which the dominion of other ſtates has ever prevailed; and the territories that compoſed it, though almoſt all held by the right of recent diſcovery and conqueſt, were not, like thoſe of Spain and Ruſſia, ſubdued and retained with eaſe; nor were they tracts of uſeleſs country, thinly peopled, poſſeſſed only of unimproved natural reſources, and inhabited by a few tribes of wandering ſavages mingled here and there with nations ſomewhat more civilized. The Portugueſe conqueſts were gained with difficulty from nations far advanced in refinement and capable of reſiſtance; the extenſion of their territory obtained from right of diſcovery, that is, ſeized from leſs civilized nations, was equal to the moſt opulent of the dominions poſſeſſed by Spain, and poſſeſſed by tribes much more warlike than the Mexicans or Peruvians; and the length of ſea-coaſt, with various convenient ports, which bounded the eaſtern dominions of Portugal during this brilliant period, was ſufficient to inſure the moſt important commercial advantages from their intercourſe with the metropolis. The whole weſtern coaſt of Africa, with the greater part of the eaſt coaſt and the Cape of Good Hope, was ſubject to the dominion of the Portugueſe, and occupied at favourable intervals by their garriſons and factories. They alſo poſſeſſed the whole ſouthern coaſt of Aſia, together with as many of the Indian iſlands as they choſe to ſettle in, from the gulf of Perſia to China and Japan, where they had a few important commercial ſtations. This unparaleled extent of naval territory gave them the undiſputed command of all thoſe ſeas, and enabled them to carry into execution the ordinary ſchemes of the mercantile ſyſtem with uncommon vigour and ſucceſs, by confining all intercourſe with Aſia and Africa to their own European territories. The power, adds the writer whom we are now citing, which they poſſeſſed over the interior of thoſe vaſt and opulent regions, ſupported their commercial eſtabliſhments, and enabled them to gratify with unexampled licence that tyrannical ſpirit which has always, though in different degrees, ſignalized the intercourſe of European ſtates with the refined and amiable inhabitants of their Oriental provinces. Such, during the whole of the 16th, and the greateſt part of the 17th century, was the magnificent outline of the Portugueſe empire in Africa and Aſia. The romantic deſcriptions of their own authors, corroborated by the teſtimony of other nations, their rivals and enemies, are ſufficient to prove that the achievements and wealth of their nation in the provinces of the Eaſtern empire were ſuperior to any which it could boaſt of elſewhere; and the remains of the Portugueſe dominions in Africa, where at this day 15 kings are tributary to the court of Liſbon, together with the glittering fragments of the Aſiatic empire, corrupted by bad policy, as well as diſmembered by foreign conqueſt, may convince us of the important relations which the provincial wealth and power of this nation muſt have formerly borne to its whole reſources. The Eaſt Indian poſſeſſions of Portugal, during the 16th century, threw into their hands the whole commerce of Aſia, which, long before the diſcovery of the paſſage by the Cape of Good Hope, had formed one of the greateſt trades carried on between any two parts of the world; had enriched and refined the whole European empire of Rome, and raiſed the inconſiderable republic of Venice to a degree of power formidable to all the great nations of the continent. The ſame commerce, divided among ſeveral ſtates, has, ſince the downfal of the Portugueſe dominions, ſenſibly enriched all thoſe nations, and continues to form a very great part of their extended trade. We may judge, in ſome degree, of the extent of the trade carried on by the Portugueſe in their Aſiatic ſettlements, ſome time after their eaſtern empire had begun to decline from the competition of the Engliſh and Dutch, by a ſingle fact. In the year 1611, the Engliſh company's ſervants, in one of their voyages to Surat, ſaw a ſingle Portugueſe merchant fleet, conſiſting of 240 ſail, bound for one place, and deſtined only for the commerce of the northern and moſt trifling ſettlements. (Anderſon's Hiſt. of Commerce, ii. 245, 263.) The African and Aſiatic provinces, however, muſt be conſidered as conquered territories, held in ſubjugation by a few troops and ſquadrons of ſhips; not as colonies peopled by emigrants from the mother country, or by a race in which thoſe emigrants and their deſcendants bore a conſiderable proportion. Of theſe vaſt dominions the Portugueſe were nominal poſſeſſors; the treaſure and blood of the metropolis were waſted in wars with the native powers, and the relations of commerce were on every occaſion poſtponed for thoſe of conqueſt and dominion. Theſe circumſtances have eventually proved fatal to the Portugueſe dominion in the Eaſt, which has at length been transferred to other powers of ſuperior policy and ſtrength.

The Portugueſe trade with India, though rigorouſly confined to the ſubjects of the mother country, was never put into the hands of an excluſive company, incorporated by charter, except for a ſhort time, about the year 1731, when the experiment was unſucceſsfully tried. The ſovereign granted, from time to time, privileges of fitting out veſſels, under limitations, to private co-partners and individuals, who thus enjoyed a monopoly of the ſupplies required both by the Aſiatic and European provinces. The monopoly had been generally veſted in the crown, until the year 1752, when it was ſaid to be aboliſhed; but ſeveral important articles ſtill continued ſubject to the royal privileges, and could only be bought in India and ſold in Europe on the king's account. From the ſplendid pre-eminence which the Portugueſe trade with India once poſſeſſed, it has ſunk to a few annual voyages, in conſequence of the reduction of the Portugueſe empire in the Eaſt, and the bad management of the trade and ſettlements that ſtill remain. With a view to its revival, new excluſive grants have been made to mercantile adventurers in Europe, and an excluſive company has been eſtabliſhed at Goa (the chief Eaſt Indian ſettlement) for the management of the whole trade with China. Theſe abſurd managements have taken place ſince the year 1752, when the evils perceived to ariſe from monopolizing policy, induced the ſovereign to abandon ſeveral of his excluſive rights, and to pretend that the Eaſt Indian commerce was thrown open. While the Portugueſe conqueſts were rapidly ſurviving each other in the Eaſt, the diſcovery of Bengal, opened a new field of exertion in the Weſt. Brazil, however, compared with Aſiatic conqueſts, was regarded with indifference, and ſlowly peopled by malefactors, and by thoſe whom the perſecuting ſpirit of the times drove, from the mother-country. Among the emigrants of this period, ſacrificed to the cruel bigotry of the inquiſition, was a great body of Jews, who carried over with them to the colony the ſkill and induſtry with which they had enriched and ſtrengthened the European dominions of Portugal. Under their cultivation the natural wealth of this fruitful territory began to appear, and by degrees to attract the attention of government. All the Portugueſe ſubjects, who choſe to ſettle in Brazil, were permitted to ſubdue large tracks of country, and to hold them as fiefs of the crown, with abſolute power over the natives whom they had conquered, and with all the prerogatives of royalty, except capital juriſdiction, coinage, and tithes, which were invariably reſerved to the ſovereign. Theſe great territorial lords thus acquired an almoſt abſolute authority, over domains often extending 40 or 50 leagues along the ſea-coaſt; and generally leaſed out parts of their poſſeſſions to ſub-vaſſals for terms of 2 or 3 lives. This arrangement immediately attracted to the colony a number of adventurers and opulent perſons from the mother country. The importance of this colony, in conſequence of the whole territory of Brazil, and the cultivation of various uſeful articles, gradually increaſed; and its traffic with the parent ſtate, would have proved a great mutual benefit; if an erroneous policy had not confined it to a few ports in each part of the empire. Annual fleets from Liſbon and Oporto alone were permitted to carry on this rich commerce, under regulations ſimilar to thoſe of the Spaniſh flotas and galleons. Four emporiums, *viz.* Olinda, St. Salvador, Paraiba, and Rio Janeiro, were appointed for the deſtination of thoſe ſquadrons, and the ſupply of the whole colony. The 18th century opened with a diſcovery of gold and diamond mines; and ſince that period many regulations have been adopted, which have proved pernicious both to the colonies and to the parent ſtate. Companies were eſtabliſhed at Peru, Fernambuco, and Maragnan, which did not long ſurvive the downfal of Pombal, the Portugueſe miniſter: theſe have ceaſed to exiſt above 20 years, after proving highly injurious to both the mother-country and the colony during an equal period of time. A new and more liberal ſyſtem has been introduced; but the royal monopolies ſtill exiſt in their full force, and obſtruct the growth, as well as the circulation, of the moſt valuable ſtaple produce which Brazil ſupplies. Since Portugal has experienced the irretrievable loſs of her rich Eaſt Indian commerce, and a diminution of the traffic formerly carried on with Africa, Brazil is of great importance to her. This colony is better governed and peopled than any of the Spaniſh dominions; its proximity to Africa and connection with the Portugueſe ſettlements there, afford great facility in the increaſe of its cultivation, by means of negroes; the poſſeſſions of Brazil gives Portugal conſiderable weight in the continental politics; and the poſſeſſion of this noble colony, beſides yielding a clear revenue to the mother-country (above one-fourth of the whole national income) is the ſource of a great proportion of her whole commerce;—the imports from them being nearly equal to the whole imports from the other countries of Europe.

The colonies of Sweden and Denmark, are too inſignificant to influence, in any conſiderable degree, the proſperity of the parent ſtates, and bear a leſs proportion to the whole imperial reſources than thoſe of any other nation. The excluſive companies, which for a long ſeries of years monopolized all the colonial trade of both theſe countries, have been peculiarly injurious. See Company, *Daniſh* and *Swediſh*.

For an account of the colonies of France and England, the limits of our article oblige us to refer to the articles FRANCE and ENGLAND, WEST INDIES, EAST INDIES, and COMPANY, and the ſeveral individual iſlands of the Weſt Indies.

There are ſome other kinds of colonies, beſides thoſe above enumerated, of which we ſhall give a brief account. Conquered ſubjects or priſoners of war have been ſometimes removed to particular and ſelect places, either for ſafe cuſtody, or for the cultivation of waſte lands. The ancients more frequently practiſed this ſpecies of colonization than the moderns, who prefer exchanging the priſoners on each ſide. The Romans, in particular, were conſtantly accuſtomed to remove the more active and daring nations to a diſtance from their native abodes, and to oblige them to reſide in ſome ſelect place which was probably leſs defenſible than their own country, and where, of courſe, they would be more under command. We are not, however, without ſome examples of this kind, even in our own times. The Maroons, or remnant of the Spaniſh ſlaves, who had been relinquiſhed by their maſters, and left on the iſland of Jamaica, when the Spaniards were expelled by the Engliſh, after having long gallantly reſiſted the forces brought againſt them, at laſt ſubmitted to one of his majeſty's officers, upon condition of not being ſent off the iſland. To this ſubmiſſion they were induced by the fear of a new ſpecies of warfare with which they were threatened, *viz.* the uſe of blood-hounds to diſcover their retreats. But the legiſlative aſſembly of the iſland not only refuſed to pay the Spaniſh police-runners their ſtipulated bounty, but alſo took advantage of ſome unavoidable delays in the performance of the treaty to annul it altogether, and to tranſport the Maroons to Nova Scotia, whence they were afterwards removed to Sierra Leone. On account of this flagrant act of injuſtice the commanding officer of his majeſty's troops indignantly refuſed a handſome ſword, which the aſſembly offered him for his ſervices in putting an end to a war which had been ſo long protracted. See MAROONS.

Another kind of colonization is the removal of convicted criminals, or of debtors, to ſome deſart ſpot, in order to work the mines, or break up the land, and thus prepare it for more reſpectable coloniſts. The Ruſſians uſe this mode of colonizing their vaſt lands in Siberia. But the moſt intereſting colony of this deſcription, particularly to Engliſhmen, is that of NEW HOLLAND, which ſee.—Alſo, BOTANY-*bay*, and *New South* WALES.

Great ſums of money have been, and ſtill are, annually expended on this colony, but it has hitherto languiſhed; partly from the diſproportionate nnmber of the ſexes, and the idle habits of the convicts, but ſtill more from ſome radical defects in its adminiſtration, many parts of which render it more like a mere job for contractors and agents, than a well regulated ſyſtem for the gradual reformation of the criminals, and for rendering them uſeful ſubjects in future. The diſſentions alſo which have taken place among the officers there, cannot but have tended to injure the colony. Theſe diſſentions ſeem to have originated in ſome meaſure from the governor being always a naval officer. The abſurdity, for ſuch we muſt eſteem it, of a naval officer commanding in chief on ſhore, merely becauſe he went to the place by ſea, is fully equalled by ſeveral others, which demonſtrate how inadequate to the undertaking were the framers of the ſyſtem by which the colony is regulated.

During the firſt ten years, *viz.* from 1787 to 1797 incluſive, the number of convicts ſent to New South Wales was 5765 men and women, and 93 children, being in all 5858 perſons. The expence of tranſporting, feeding, and governing them, during that period, amounted to 1,087,230*l.* being above 177*l.* for each, excluſive of the expences previous to their embarkation.

The number of convicts remaining was as follows:

Men convicts in the ſettlement -	2175
Women - - - - -	939
Convicts ſent out in 1796 and 1797, Not arrived - -	695
Total -	3802

So that a loſs of 2049 convicts had been ſuſtained in this ſhort period; an evident proof of the moſt glaring miſmanagement. On the firſt of September, 1796, the agricultural ſtate of the colony was as follows:

	On account of government.	In poſſeſſion of private perſons.
Acres of land in cultivation -	1700	3719
Horſes - - -	14	43
Black cattle - -	150	77
Sheep - - -	191	1340
Goats - - -	111	1316
Swine - - -	59	1810

The later accounts which have been received are equally unpromiſing. The ſpirit of diſſention has increaſed, and ſpread itſelf to every rank: ſo alſo has the depravity of the convicts, in conſequence of their not being ſeparated, and placed under the controul of ſteady perſons who have an intereſt in watching over their moral improvement. Indeed, the viciouſneſs of the convicts increaſed by fellowſhip, and even many of the free ſettlers have, from the force of evil example, acquired the ſame bad habits. The quantity of land cultivated on the public account is too great, and the numerous public works abſorb the labour of the convicts, and leave but few of them to be hired out to ſettlers. Theſe circumſtances, together with the ill ſelection of the convicts, and of the ſettlers, as to their former employments, contribute to the want of ſucceſs in the colony.

It certainly is not improper to ſend, as matter of favour, criminals to remote and deſart places to procure their own livelihood, furniſhing them at firſt with a few neceſſaries, and then leaving them to their own induſtry, or to ſupply the free ſettlers in thoſe places with convicts for ſervants, in order to free them from the heavy expence incident to their procuring ſervants from a diſtance. But the idea of tranſporting large bodies of criminals to an immenſe diſtance, and employing them, under a ſtrong guard, in public works, where few ſuch works can poſſibly be wanted, and in cultivating land in the produce of which they have no intereſt, does not ſeem to have been happily choſen, or very promiſing, even in theory; and we may add, that practice, upon a very extenſive ſcale, has completely ſhewn its futility.

The Romans, it is true, tranſplanted their priſoners of war to diſtant countries, and employed them on public works; but theſe works were carried on in well inhabited countries, and were deſigned for the facilitation of the intercourſe between the ſeveral parts of the empire, or for adorning the cities with marks of the Roman grandeur.

We believe, however, that the colony of New South Wales might be made to anſwer much better, if a few ſimple regulations were adopted, and particularly if the employment of ſo many convicts on account of government was aboliſhed, and the convicts left more to their own induſtry.

It was formerly obſerved in Virginia, that the colony languiſhed ſo long as the cultivation of the ground, &c. was carried on as a public concern, but that it immediately begun to flouriſh when the lands were divided, and every one left to ſhift for himſelf.

The want of capital and experience among the majority of the convicts, forms no objection; as, by furniſhing thoſe accuſtomed to huſbandry, gardening, or uſeful trades, with the neceſſary ſeeds and tools, and "a very ſparing allowance of proviſions, to be gradually diminiſhed," there can be no doubt but that, in a very ſhort time, they would not only be able to repay the advances made them, with intereſt, but alſo to pay a gradually increaſing rent. As to thoſe bred to no profeſſion uſeful in the colony, they might be lett out by auction, for a year at a time, until they had acquired ſufficient experience: and a fourth part of their wages might be deducted and laid by, to form a ſtock when they were capable of uſing it, another part being paid into ſome benefit ſociety.

Hitherto we have ſpoken of external colonies, or thoſe in which the coloniſts recede from their mother-country, and eſtabliſh themſelves in foreign land, without, however, ſubmitting to their form of government.

It now remains to treat of thoſe colonies in which large communities of foreigners are, for ſome particular reaſons, permitted to enter and ſettle in a country; which colonies differ from thoſe founded by private adventurers, only becauſe they do not ſo ſtrongly affect the political ſyſtem of the country.

The Ruſſian government, having immenſe tracks of waſte lands, ſome of which are advantageouſly ſituated for mines or for commerce, has, as we have already ſaid, beſtowed great attention in endeavouring to people theſe tracks, as well by foreigners as by natives. The Pruſſian government has alſo beſtowed the ſame laudable attention to the improvement of the waſte lands in its poſſeſſion; and it even went ſo far as to require from the Poles a tribute of marriageable virgins, with a ſtipulated portion for each.

To this ſpecies of colony belongs what is uſually called the Babyloniſh captivity of the Jewiſh nation, and which is erroneouſly ſuppoſed to have been a removal of the whole nation in a ſtate of ſlavery: whereas it evidently appears, from their own records, that it ſimply meant the reſidence of the Jewiſh chiefs, and of their prieſts, at the court of the king of Babylon. The number of perſons carried off by the king himſelf, was (2 Kings, xxiv.) only 10,000; a number ſurely applicable only to the higher claſſes. The offices which many of them held in the Babylonian court, and ſubſequently in the Perſian, are a proof, that although they were, for obvious political reaſons, required to reſide at court, their ſituation there was perfectly honourable. It is probable, however, that their removal might occaſion the gradual emigration of a number of other families, who followed them for the ſake of employment, and ſpread over the Babylonian dominions; as their number was found to be greatly encreaſed, when they were allowed by the Perſians to return. They then amounted (Nehemiah, vii. Ezra, iii.) to 49,697 perſons.

Many other inſtances may be found, both in ancient and modern hiſtory, of this importation of people. The conquered Greeks filled the capital of the Roman empire, and, by the verſatility of their talents, acquired the ſame influence over the maſters of the world, as the modern French (who frequently boaſt of their Greek origin) have over the faſhionable part of our own country. By means of this influence, they introduced among the Romans all the vices for which they were notorious; and to the baneful effect of their influence, we may juſtly attribute, in great meaſure, the downfal of the empire, ſince they introduced a love of diſſipation, and of ſhowy, but trifling acquiſitions, inſtead of the more ſolid attainments which were required, before they contaminated the public mind.

The importation of ſlaves into a country, may be regarded as a kind of internal colony of the moſt important, becauſe dangerous nature. When the ſlaves are numerous, they are not only retained in ſubjection with difficulty, (being in general far ſuperior in bodily ſtrength) but they are alſo of very doubtful fidelity, and ever ready to join any invader, or to flock to the ſtandard of any military adventurer. There is yet ſtill greater danger if an independent ſtate exiſts in the neighbourhood, and particularly if it ſhould conſiſt of revolted ſlaves (as has lately happened in St. Domingo), becauſe the greater energy of an independent government enables it to proſecute any ambitious deſigns of conqueſt with decided advantage over a delegated authority.

It is, therefore, highly impolitic that ſlavery ſhould be conſtantly permitted in any country; and, although, for the ſake of bringing labourers to any particular ſpot, it it may be tolerated at firſt, it is the bounden duty of every ſtate to take deciſive meaſures to convert the ſlaves, by degrees, into free ſubjects, and to put a ſtop to the importation, as ſoon as the colony has obtained a certain population, and further to take ſome ſteps in order to liberate the ſlaves already imported, or at leaſt to make their offspring free at a certain age. Thus it will be requiſite for the coloniſt to attend to the welfare of his preſent ſtock, and to introduce taſk-work, whereby he will be changed, in time, from a commercial capitaliſt, or a needy planter, into a landed gentleman. He will then be ſolicitous only for his rents, and deprecate the idea of keeping more land in hand than is neceſſary for the ſupport of his eſtabliſhment, or to ſerve as an example of perfect cultivation and grazing to his tenants, to the moſt induſtrious of whom he might furniſh capital and favourable leaſes, in order to enable them to improve his own land.

To a neglect of this ſalutary precaution, we may attribute the preſent dangerous ſtate of the Dutch and Engliſh colonies in the Weſt Indies, ſince, notwithſtanding the length of time that they have been eſtabliſhed, the ſtate of ſociety in them is as crude and ſemi-barbarous as it was at the time of their being firſt ſettled.

It was probably owing to a ſimilar neglect that the weſtern provinces of the Roman empire were ſo ſpeedily ſubdued by the northern adventurers. The Roman provincials, like the planters in the Weſt Indies, ſeem to have had little repugnance to a change of maſters; partly becauſe the reſident planters were thus relieved, at leaſt for ſome time, from the claims of their creditors; partly becauſe the agents were enabled, in many caſes, to convert the plantations to their own benefit; and, laſtly, becauſe both were equally afraid that, in caſe the war was protracted, they ſhould loſe their ſlaves. See SLAVES.

As to their intrinſic nature, colonies are either *agricultural*, which grow within themſelves the principal articles of their food and ſubſiſtence; or they are *commercial*, which depend upon other countries for the neceſſaries of life, and devote themſelves to the traffic of a few ſtaple commodities. The northern ſtates of America and the Bermuda iſlands are ſo many inſtances of agricultural colonies; while the Weſt Indian iſlands, together with Virginia and Maryland on the continent, are examples of commercial colonies.

In reſpect to the advantages or diſadvantages of external dependent colonies, no perſon has more thoroughly conſidered the ſubject than Mr. Brougham, in his elaborate treatiſe "On the Colonial Policy of the European Powers." The adoption of all the poſitions advanced by that ingenious writer, may indeed be ſomewhat hazardous; eſpecially if we conſider the great degree of doubt and uncertainty which hangs over all political ſpeculations, on account of the difficulty, and ſtill more the danger of making experiments on thoſe ſubjects; to ſay nothing of the want of means for aſcertaining whether the effects are aſcribed to the right cauſes, when (as is uſual in human affairs) ſo many cauſes concur in producing thoſe effects.

The firſt advantage ariſing from colonies dependent upon any country, is the extenſion of the home trade; for ſuch in fact the trade between the mother-country and the colony may fairly be conſidered, becauſe the whole of the profits is retained within the ſtate; whereas in foreign trades, one of the profits, either that of the buying, or of the ſelling merchant, goes to enrich a foreign ſtate. The trade of a colony alſo produces a conſiderable augmentation of the mercantile navy of the mother-country, and, at the ſame time; as the ſhips and their crews are conſtantly retained within the power of the ſtate, there is far leſs danger of the ſailors being enticed into foreign ſervice, than if part of their time was ſpent in foreign ports. The European nations have anxiouſly endeavoured to confine the trade of their colonies to the merchants of the mother-country by poſitive regulations; but Mr. Brougham thinks this ſolicitude is abſurd and even nugatory. Merchants will, in all countries, prefer dealing with their own countrymen, with whoſe language, laws, and habits of thinking they are acquainted. And this is more eſpecially the caſe in commercial colonies, as they require in general ſuch large advances of capital, that few perſons would be inclined to inveſt ſums upon private foreign ſecurity.

But the greateſt utility of colonies, is the affording an opening for the employment of the ſuperfluous population of the mother-country, which muſt otherwiſe either emigrate to the neighbouring foreign nations, or die of want at home. The inhabitants, indeed, of agricultural colonies, are in general ſtationary, and, as it were, loſt to the mother-country; but theſe colonies only attract thoſe who cannot get employment at home, or in the commercial colonies, or thoſe who are in ſuch deſperate circumſtances that they are obliged to fly from home to avoid the importunities of their creditors. Commercial colonies, on the other hand, have for the moſt part only a temporary population, as the coloniſts, after ſpending a part of their time in the colony, generally return home with their fortunes improved, and carry with them, to the mother-country, the ſame ſpirit of improvement to which they owed their ſucceſs in the colony.

Commercial colonies have a further advantage, in furniſhing employment for thoſe large capitals which would otherwiſe be employed upon the more diſtant foreign trades, or lent to foreign ſtates.

We ſhall now ſay a few words reſpecting the diſadvantages ariſing from the poſſeſſion of colonies; theſe are ſo great that the economiſts have loudly declaimed againſt the utility of forming ſuch eſtabliſhments; but they have committed a fundamental error, in conſidering colonies as foreign ſtates. They ought rather to be conſidered as mere extenſions of the parent ſtate, into regions adapted to the production of articles which cannot be raiſed at home. A circulation of inhabitants is kept up by the commercial intercourſe between the colony and the mother-country, and alſo by the weakneſs incident to parts remote from the ſeat of government. So that, as the colonies require, at all times, the foſtering care of the mother-country, they are generally filled with the troops of the parent ſtate and their followers, and the ports are conſtantly reſorted to by its ſhipping, both mercantile and warlike. It were needleſs to inſiſt upon the powerful attractions reſulting from their common origin, their identity of language, and their ſimilarity of habits in thinking; as the effect of theſe, in producing a good underſtanding among nations, muſt ſtrike the moſt inattentive obſerver.

One of the principal diſadvantages of colonies, is the wars into which they ſeem to draw the nations which poſſeſs them. But although it is certainly true that external commercial colonies do, in the preſent times, generally become the ſeat of warfare between ſuch of the belligerent powers as poſſeſs them, it cannot be allowed that they are the cauſes of the war; for as they increaſe the frontier to be defended, thoſe nations which poſſeſs them will be leſs ready to engage in hoſtilities; and it is the weakneſs of the colonies, (on account of their deficient population preventing the raiſing of regular troops in them), that is the principal cauſe of the enemy chuſing rather to invade them, than to force his entry into the parent ſtate. The want of a powerful landed intereſt, in colonies of this nature, tends alſo to attract the hoſtilities of the enemy, as the poſſeſſion of them is ſeldom diſputed with the obſtinacy which marks the reſiſtance to invaſion in old ſettled countries; the defence being limited to the ſmall number of troops which the parent ſtate can ſpare without endangering her own ſafety, and whoſe exertions are impeded by the mixture of an ill-diſciplined militia, and of volunteers, unaccuſtomed to ſervice, and deploring their fate in being forced from their own homes.

This unfitneſs of external colonies, which are always underſtocked with inhabitants, to contribute ſupplies of men for the general defence of the ſtate, is uſually conſidered as a diſadvantage; but it cannot in reality be eſteemed to be one of much conſequence. Even in the parent ſtate itſelf, it is only in thoſe manufacturing diſtricts that produce articles, the demand for which is variable, that the recruiting ſervice meets with ſucceſs; in thoſe where agriculture prevails, or in which a ſtaple commodity is manufactured, that ſervice is in general unſucceſsful. It cannot, however, be of any conſequence, in regard to the general population of the empire, whether the mother-country ſupplies ſoldiers, or whether they are raiſed in the colony, and their place ſupplied by freſh ſettlers.

It is only the total want of ſyſtem, both in the planting and ſubſequent management of the Engliſh colonies, that rendered them at firſt, and ſtill keeps ſeveral of them expenſive burthens to the mother-country; as thoſe of other countries not only pay, in general, their own expences, but alſo furniſh a ſurplus revenue for the ſervice of the empire.

It will appear, from what we have already ſaid, that a great difference of political ſtrength ſubſiſts between agricultural and commercial colonies. The former are much ſtronger internally, and capable of affording, with their own reſources, a more obſtinate defence to the attacks of the enemy. But this ſtrength renders them refractory, and difficult to be controlled; hence they require either early reſtraint, and the obſervance of a ſtrict diſcipline, or they muſt be relinquiſhed as dependencies, and incorporated into the mother-country, as has recently been found neceſſary in reſpect to Ireland. On the other hand, although the weakneſs of commercial colonies renders them much more dependent on the ſtate to which they belong, yet, from the debts with which they are in general loaded, they are ever ready to ſubmit to any invader; eſpecially if the change can be made to a ſtate, where the merchants poſſeſs larger capitals than thoſe of the ſtate to which they have already been ſubjected; as this affords them a hope, not only of being releaſed for ſome time from the claims of their ancient creditors, but alſo gives them reaſon to ſuppoſe they may be able to procure ſtill greater credit from their new maſters. Every perſon acquainted with Weſt Indian affairs muſt acknowledge the truth of this remark; and with reſpect to other parts, we have, ourſelves, twice experienced the facility and even eagerneſs with which the Cape of Good Hope was ſurrendered to us.

The want of mercantile capital which our enemies in the Weſt Indies do not as yet poſſeſs, is the principal ſecurity we have that thoſe coloniſts will rather chuſe to remain under our dominion than fall into the hands of other powers, as they would, in that caſe, be obliged to diminiſh their cultivation in conſequence of the diminution in the advances made by the merchants upon their future crop. And as to any attempts at independence, the mother-country has a conſiderable ſecurity in the precarious ſituation of the inhabitants; in conſequence of the number of their ſlaves and the diſcontent that generally prevails among them. This latter circumſtance, might, by thoſe who think the poſſeſſion of colonies, and the monopoly of their trade, are of great benefit to a nation, be thought to afford a good argument againſt the abolition of the ſlave trade, as tending indirectly to leſſen the dependency of the colonies. But we may remark, that the greater ſtrength of the colonies, ariſing from their internal improvement in conſequence of the abolition of the ſlave trade, would more than counterbalance the danger of their revolt, as they would, in conſequence of ſuch ſtrength, run leſs hazard of falling into the hands of an enemy. And the event of the American war has fully proved, that even in the caſe of the colonies revolting, when they had acquired ſufficient ſtrength, the commercial intercourſe between the two countries would continue, and probably rapidly increaſe; ſo that the government would, at the worſt, loſe only an expenſive incumbrance. It can only be by the influx of foreigners, belonging to a mercantile nation, in ſuch numbers as to acquire a preponderance in the ſtate, ſo as to alter the fundamental laws and language of the colony, that any great change in its commercial relations would be effected.

The moſt ſerious diſadvantage of colonies, is that they divert the capital of the nation from the improvement of the mother-country; although this improvement is certainly the moſt advantageous employment in which the capital of any nation can be engaged. It has indeed been aſſerted, that the labour of one man on the continent of America, produced more to the ſtate than four at home; but this muſt be regarded as the mere rant of viſionary politicians, being totally unfounded and abſurd in the higheſt degree; for the ſubjects at home being directly taxed, muſt yield far more revenue than thoſe in the colonies, who are in general only indirectly taxed to the common ſervice of the empire, by the cuſtoms levied upon the commercial intercourſe of the two countries. The ſame perſons aſſerted that each white perſon in Virginia and Maryland, took off from ten to twelve pounds a year of the growth or manufactures of the mother-country. But the cuſtom-houſe books are ſufficient evidence that this calculation was much over-rated; for the exports to thoſe colonies were never more than 300,000*l.* a year, and therefore, allowing them to contain, as was ſtated, 120,000 white perſons, the conſumption of each perſon was only 1*l.* 13*s.* 4*d.* a head. The whole of the exports to America, when at the higheſt, was only about 834,000*l.* a year; and this tends to ſhow that it is better to retain the induſtry of the inhabitants of any country within its own ſphere, and encourage the cultivation of the waſte lands, than to divert it to diſtant colonization. It may, however, be ſometimes neceſſary, as a meaſure of precaution, to ſecure the poſſeſſion of diſtant places, when it is known, or ſuſpected, that the uſual enemies of the ſtate intend to colonize them; but it is extremely improvident to foſter theſe diſtant colonies at the expence of the mother-country, as is done in reſpect to the Britiſh colonies. When an old ſettled country is improved to the higheſt, then, and then only, can it be neceſſary to provide outlets for the employment of the ſurplus capital of its ſubjects, by conquering, or purchaſing ſome poor country, with a view to its improvement.

As to internal colonies, the encouragement of foreigners, and eſpecially the importation of foreign ſlaves, muſt, in general, be regarded as errors in politics. The procuring of a ſtock of labourers in the firſt ſtage of breaking up a new and uninhabited colony, the introduction of new manufactures, or of new commercial relations, can alone juſtify ſuch meaſures. And ſurely it is far better to endeavour to attain theſe ends by other means. The removal of idle and diſorderly perſons from great cities, the ſending out intelligent travellers into other countries, the encouragement of experimental philoſophers and chemiſts, together with the apprenticing of clever youths to merchants in foreign countries, would probably be equally efficacious. See Smith's Wealth of Nations, B. iv. chap. 7. Robertſon's Hiſt. of America, vol. iii. Brougham's Inquiry into the Colonial Policy of the European Powers, 1803, vol. i. and ii. paſſim. Paley's Principles of Moral and Political Philoſophy, vol. i. p. 381. Edwards's Weſt Indies, vol. ii.

Colony *of Bees.* See Hive.

COLOONY, in *Geography*, a ſmall poſt-town of the county of Sligo, Ireland, remarkable for the check given to the progreſs of the French troops under general Humbert, in September, 1798, by the gallantry of lieutenant-colonel Vereker with about 300 men chiefly of the city of Limerick militia. Though col. Vereker was obliged to retreat in conſequence of the number of the enemy, yet he ſaved the town of Sligo, and by the delay he occaſioned, enabled marquis Cornwallis to come up with and entirely ſubdue the French force. Coloony is 98 Iriſh miles N.W. from Dublin, and five S. from Sligo.

COLOOR, or Colore, a town of Hindooſtan, in the circar of Guntoor, which poſſeſſes a diamond mine on the ſouthern bank of the Kiſtnah, and not far from Condavir.

COLOPENA Regio, in *Ancient Geography*, a country of Aſia in Cappadocia; Sebaſtopolis and Sebaſte are towns of this country.

COLOPHON, a town of Aſia Minor now *Attoleſco*, or according to others, *Belvidere*. It was one of the chief cities of the Ionian league, ſeated near the ſea, and not, as Pliny calls it, an inland city, in the ſmall river Haleſus, N.W. of Epheſus and S.S.E of Smyrna. It was founded by Mopſus, grandſon of Tireſias, and, in proceſs of time, Damaſichthon and Promether, ſons of Codrus, conducted a colony hither. It was deſtroyed by Lyſimachus, and its inhabitants were ſent to people Epheſus; but after his death it was rebuilt in a more convenient ſituation. The Colophonians were ſuch excellent horſemen, that thoſe, for whom they declared themſelves, were ſure of victory; whence the trite proverb "Τον Κολοφωνα επεθηκε, colophonem addere," *i. e.* to put the laſt hand to a work, or ſucceſsfully to terminate it. Colophon was the birth-place of Nicander, and one of the ſeven cities that claimed Homer, who lived there ſome time, as Herodotus informs us. The ancients mention a famous grove and temple of Apollo Darius in the neighbourhood of this city; whence ſome have ſaid that he derived this appellation, though others ſay that he was ſo called from a mountain bearing that name. The ſmall town of "Notium," on the ſame coaſt, often mentioned by Livy, belonged to the Colophonians, and the Romans allowed it the ſame privileges, which they granted to Colophon itſelf. Pliny informs us, that they collected in the vicinity of Colophon, a reſin of a yellowiſh red colour, which being bruiſed, emitted a ſtrong odour; and hence ſome have derived the name of *Colyphony*, now frequently called "Spaniſh wax," or "Grecian reſin," as it is brought from one or the other of thoſe countries. Its epiſcopal ſee was ſubject to the metropolis of Epheſus.

Colophon, a town of Greece in Epirus.

COLOPHONIA, in *Botany*, Commers. See Bursera *paniculata*.

COLOPS, in *Geography*, the name given by Dion to a river of Pannonia, called *Colapis*, by Strabo.

COLOQUINTIDA, in the *Materia Medica*. See Colocynthis.

COLOR, in the *Ancient Muſic*. See Colours.

Color *Indicus*. See Indicus *Color*.

Color *nero e roſſo*, Ital. black and red, in *Muſic*. We have ſeen in Bene't college, Cambridge, old muſic books of Henry VII.'s time, in which ſome of the notes were black, and ſome red.

COLORADO, in *Geography*, a river of New Mexico, in the ſouth-weſtern part, which flows into the northern part of the Vermilion ſea, or gulf of California, called by D'Anville *colorado de los maityres*. The courſe of this river, which is generally from N E. to S.W. ſometimes W. may be computed at 600 Britiſh miles. It is called Rio Colorado, or Red river, becauſe the waters acquire that colour from the red clay on which the rains fall. Its ſtream is deep and copious, and capable of conſiderable navigation. The neighbouring ſavages, who ſwim acroſs it by a peculiar artifice, are denominated *cocomaricopas*, which ſee. This river is joined from the eaſt by a large river, called Gila, which, however, is everywhere fordable. The country between theſe rivers is ſaid to be an upland deſart, without water or paſture. On the other ſide of the Colorado, the country is ſaid, on the contrary, to be very fertile, and the natives rather fond of cultivation. It is thought that conſiderable rivers alſo join the Colorado from the weſt, flowing from the ſame chain of mountains that ſupply the ſources of the Rio Bravo, in lat. 40°. Among theſe the Zaguananas is the moſt lengthened ſtream, and may therefore be regarded as the Colorado itſelf. On the weſt of the Colorado, the river of Martyrs, and that of Pyramids, have umbraceous terminations, perhaps in the ſame lakes, or, perhaps in the Colorado. In lat. 39° W. long. from Madrid, 110° 30′, there is a large lake without a name, which receives two conſiderable rivers from the eaſt, one of which is called Buenara. From lat. 40° to 43°, and under the ſame meridian, extends another lake, which, though not fully explored, ſeems to be that of Imparices, where the fathers Velez and Eſcalante terminated their diſcoveries, and the utmoſt inland knowledge of the Spaniards. If, indeed, the Spaniards have explored that part of the country, they conceal their information.

On the eaſt of the ſame chain, from which ſprings the Rio Bravo, ariſe two rivers, which probably join the Miſſvari; and it appears that the eaſtern river of Colorado has been confounded with another river of the ſame name, with the epithet of Nachitos, which probably joins the Arkanza or Akanſas. See Colorado or *Riviere Rouge*, infra.

Colorado, a river of New Mexico, which runs into the bay of St. Bernard, in the gulf of Mexico.

Colorado, *Riviere Rouge*, or *Red River*, a river of North America, in Louiſiana, which runs into the gulf of Mexico, or rather joins the Miſſiſſippi river, before it falls into this gulf, ſome miles above New Orleans.

COLORADOS, Los, a numerous cluſter of ſmall iſlands or rocks, near the N.W. coaſt of the iſland of Cuba.

COLORATURA, in the *Italian Muſic*, is uſed to denote all ſorts of variations, trillos, diminutions, &c. that can render a ſong agreeable.

COLORBASIANS. See Colarbasians.

COLOREDO, in *Geography*, a town belonging to the ſtate of Venice, in the country of Friuli; ſeven miles N.W. of Udina.

COLORETTI, Matteo, in *Biography*, was born at Reggio, in the year 1611, and is ſpoken of by Tiraboſchi and the abbé Lanzi, as a moſt excellent painter of portraits.

COLORIFIC *earths*, in *Mineralogy*, a claſs or tribe of earths, in the arrangement of Kirwan, deſcribed by him as ſtrongly ſtaining the fingers. Of theſe he enumerates four families, *viz.* red, yellow, black, and green; the *red* is the reddle, or rubrica fabrilis. Rothel. Laſni, o. 973. Of dark cochineal red colour, or intermediate between brick and blood red, having neither luſtre nor tranſparency; fracture, earthy, ſometimes conchoidal; fragments, 1; hardneſs, 4; ſp. gr. inconſiderable; adhering pretty ſtrongly to the tongue; feeling rough; aſſuming a poliſh from the nail; ſtrongly ſtaining the fingers; falling immediately into powder in water, and not becoming ductile; not efferveſcing, nor eaſily diſſolving in acids. When heated to redneſs, crackling and growing black; at 159° the ſpecimen (Leſke, o. 973) melted into a dark greeniſh yellow frothy enamel. It differs from red ochres only by containing more argill. The red colour proceeds from oxygenation, and the abſence of acid. The mere air of water is expelled by heat, the browner it grows. The *yellow*, Gellebarde, Leſke. o. 1098, is of an ochre yellow colour; as to luſtre, externally it often hath ſome gloſs, but internally none; tranſparency, o; fracture earthy, often inclining to the conchoidal; fragments, o; hardneſs, 3; ſp. gr. inconſiderable; adheres ſtrongly to the tongue; feels ſmooth, or ſomewhat greaſy; takes a high poliſh from the nail; ſtrongly ſtains the fingers; in water it immediately falls to pieces with ſome hiſſing; and afterwards to powder, without diffuſing itſelf through it; does not efferveſce with acids, nor is eaſily ſoluble in them; heated to redneſs, it crackles, hardens, and acquires a red colour, and gives a reddiſh ſtreak. At 156°, Mr. Kirwan melted the ſpecimen, Leſke, (o.1098) into a liver-brown porous porcelain maſs. This yellow earth differs from ochres only in containing a greater proportion of argill; the yellow colour proceeds from the calx of iron, highly oxygenated, and probably containing both water and acid. Thoſe earths which contain a large proportion of iron, have rather an orange colour. According to the analyſis of M. Sage of Paris, who has the merit of preſerving to his countrymen the immenſe gains acquired by the Dutch from converting this yellow earth into what is there called "Engliſh red," it contains 50 per cent argill, 40 oxyd of iron, 10 of water, acidulated by vitriolic acid. Mem. Par. 1779, 313. The 3d family, or black, black chalk. Schwartze, Kreide, Zeichen, Schiifer, Leſke, 3.972; Pierre noire of Briſſon, p. 163, is of a greyiſh black colour; luſtre, o; tranſparency, o; fracture imperfectly curved ſlaty; fragments 1, partly flat, partly long ſplintery; hardneſs, 5; ſp. gr. 2,114. by Kirwan's trial by Briſſon, 2,186 before abſorption of, 2,277 after abſorption of water; adheres ſlightly to the tongue, feels ſmooth, aſſumes a poliſh from a knife; gives a black ſtreak, and marks black; in water does not readily moulder, but if taken out cracks in a ſhort time; does not effervefce with acids, nor eaſily diſſolve in them; heated to redneſs, it crackles and becomes reddiſh grey; and contains ſomewhat vitriolic. The 4th family, green earth. Leſke, 0.1013, is of a greyiſh green colour; found generally in lumps in the cavities of other ſtones, or externally inveſting them; luſtre, 0; tranſparency, 0; fracture, earthy, ſometimes uneven, ſometimes verging to the conchoidal; fragments, 2; hardneſs, from 6 to 7; ſp. gr. 2,637; ſometimes feels ſmooth, does not aſſume a poliſh from the knife, nor adhere to the tongue, nor ſtain the fingers, nor mark while dry, and when wet but lightly, in water it often crumbles after ſtanding about half an hour; does not effervefce with acids, nor is eaſily ſoluble in them; heated to redneſs, it crackles and becomes of a dark reddiſh cream colour; at 147°, the ſpecimen (Leſke, 0. 013) melted into a black compact glaſs, reſembling that of baſalt; which ſhews it to conſiſt of ſilex, argill, iron not much oxygenated, and oxyd of nickel, from which the green colour is derived, beſides water. Kirwan's Elem. of Mineralogy, [illegible]

COLORINA, or COLARINA, in *Ancient Geography*, a town of Arabia Felix. Ptolemy.

COLORISATION, or COLORATION, in *Pharmacy*, a term applied to the ſeveral changes of colour which bodies undergo in the various operations of nature, or art; as by fermentations, lotions, coctions, oxydations, &c.

COLORITES, in *Eccleſiaſtical Hiſtory*, a congregation of Auguſtin monks, inſtituted about 1530, and ſo called from *Colorito*, a mountain near Morano, in Calabria, where a church was erected to the Virgin Mary.

COLORNO, in *Geography*, a town of Italy, in the Parmeſan; 7 miles N. of Parma.

COLOS, a town of Tranſylvania; 4 miles N. of Coloſvar.

COLOSER SALT MINE, in Hungary; the ſtratum of rock ſalt in this famous mine, is of the enormous thickneſs of 60 fathoms; the diameter of the excavation made therein by the miners, is 50 fathoms. "Born's Hungary," p. 140, 143.

COLOSVAR. See COLOSVAR.

COLOSSAL COLUMN. See COLUMN.

COLOSSE, in *Ancient Geography*, now *Chonos*, or *Konos*, a city of Phrygia Major, in that part called Pacatian, ſeated on an eminence, on the ſouth ſide of the Meander. It was built by the river Lycus, near the place where, according to Herodotus (l. vii. c. 30.) it begins to run under ground, as it does for five furlongs before it riſes again, and flows into the Meander. This city was ſituated at an equal diſtance between Laodicea and Hierapolis, and to this place Xerxes came in his expedition againſt Greece. All theſe three cities periſhed by an earthquake, ſays Euſebius, in the 10th year of Nero, or about two years after St. Paul's epiſtle was ſent to the Chriſtians at Coloſſe. The government of this city was democratic, and its firſt magiſtrate bore the title of archon and prætor. This city, having been forcibly transferred to the Perſians by the Macedonians, paſſed afterwards to the Saleucidæ. After the defeat of Antiochus III. at the battle of Magneſia, it became ſubject to Eumenes, king of Pergamus. And when Attalus, the laſt of his ſucceſſors, bequeathed his dominions to the Romans, this city, with the whole of Phrygia, formed a part of the proconſular province of Aſia, which diviſion ſubſiſted till the time of Conſtantine. After the reign of this prince, Phrygia was divided into Phrygia Pacatiana, and Salutaris, and Coloſſe was the ſixth city of the firſt diviſion. It afterwards took the name of Chonos, or Konos.

COLOSSIANS, *Epiſtle to the*, in *Biblical Hiſtory*, a canonical epiſtle, addreſſed to the Chriſtians at Coloſſe by the apoſtle Paul, and conveyed to them by Tychicus and Oneſimus, towards the cloſe of St. Paul's firſt impriſonment at Rome, which was about the year of our Lord 63, or the 9th of the emperor Nero. As Timothy joins with the apoſtle in the ſalutation at the beginning of this epiſtle, he was ſtill at Rome, and not yet ſent away to Philippi; and hence Dr. Lardner concludes, that this epiſtle was written about the ſame time with that to the Philippians, in the year 62, and ſome time before the end of it. Although it appears from this epiſtle, that a Chriſtian church was eſtabliſhed at Coloſſe; we have no account by whom, or at what time, it was founded. Some have concluded from chap. ii. 1. that St. Paul had never been there himſelf. It is not, however, improbable, though no mention occurs of this fact in the hiſtory of the Acts, that the Coloſſians might have been converted while Paul reſided at Epheſus, conſidering more eſpecially that he ſpent no leſs than three years in that city, and preached with ſo much ſucceſs, that St. Luke tells us, (Acts, xix. 20.) that "all they who dwelt in Aſia heard the word of the Lord, both Jews and Greeks." (See Acts, ch. xvi. 6. xviii. 23.) Dr. Lardner, arguing from the teſtimony of Theodoret (tom. iii. p. 342, 343.), who lived in the 5th century, alleges a variety of conſiderations, inducing him to think, that the churches of Coloſſe and Laodicea, had been planted by St. Paul, and that the Chriſtians there were his converts. Of theſe we ſhall only ſelect the three following, *viz.* that the apoſtle was twice in Phrygia, in which were Coloſſe, Laodicea, and Hierapolis (Acts, xvi. 6.); that he does in effect, or even expreſsly ſay, that he had diſpenſed the goſpel to the Coloſſians (Epiſt. ch. i. 21—25.): and that from ſeveral paſſages which occur in this epiſtle, it appears, that the apoſtle is not writing to ſtrangers, but to acquaintance, diſciples, and converts.

The Chriſtians of the church at Coloſſe ſeem, from the honourable teſtimony that is born to them in this epiſtle, to have maintained an honourable character for their party, and the zeal they diſcovered for the goſpel; nevertheleſs, we find, from the cautions addreſſed to them in the ſecond chapter, that they were in ſome danger of being drawn aſide by the ſubtleties of the Heathen philoſophers, and the inſinuations of certain Jewiſh zealots, who inſiſted upon the neceſſity of conforming to the ceremonies of the Moſaic law. Accordingly, the grand deſign of this epiſtle is to excite the Coloſſians, by the moſt perſuaſive arguments, to a temper and behaviour worthy of their ſacred character, and to ſecure them from the influence of thoſe Pagan ſophiſts, or Jewiſh bigots, who would ſeduce them from the purity of the Chriſtian faith.

COLOSSUS, a ſtatue of enormous or gigantic ſize.

The moſt eminent of this kind was the coloſſus of Rhodes, one of the wonders of the world, a brazen ſtatue of Apollo, ſo high, that ſhips paſſed with full ſails betwixt its legs. It was the workmanſhip of Chares, a diſciple of Lyſippus; who ſpent twelve years in making it: it was at length overthrown by an earthquake, B. C. 224. after having ſtood about ſixty-ſix years. Its height was a hundred and five feet: there were few people who could encompaſs its thumb, which is ſaid to have been a fathom in circumference, and its fingers were larger than moſt ſtatues. It was hollow, and in its cavities were large ſtones employed by the artificer to counterbalance its weight, and render it ſteady on its pedeſtal.

On occaſion of the damage which the city of Rhodes ſuſtained by the above-mentioned earthquake, the inhabitants ſent ambaſſadors to all the princes and ſtates of Greek origin, in order to ſolicit aſſiſtance for repairing it; and they obtained large ſums, particularly from the kings of Egypt, Macedon, Syria, Pontus, and Bithynia, which amounted to a ſum five times exceeding the damages which they had ſuffered. But inſtead of ſetting up the coloſſus again, for which purpoſe the greateſt part of it was given, they pretended that the oracle of Delphos had forbidden it, and converted the money to other uſes. Accordingly the coloſſus lay neglected on the ground for the ſpace of 894 years, at the expiration of which period, or about the year of our Lord 653, or 672, Moawyas, the 6th caliph or emperor of the Saracens, made himſelf maſter of Rhodes, and afterwards ſold their ſtatue, reduced to fragments, to a Jewiſh merchant, who loaded 900 camels with the metal; ſo that, allowing 800 pounds weight for each load, the braſs of the coloſſus, after the diminution which it had ſuſtained by ruſt, and probably by theft, amounted to 720 thouſand pounds weight.

Some critics obſerve, that the coloſſus of Rhodes gave its own name to the people among whom it ſtood; and that many, at leaſt among the ancient poets, call the Rhodians *Coloſſians:* hence they advance an opinion, that the Coloſſians in ſcripture, to whom St. Paul directs his epiſtle, are, in reality, the inhabitants of Rhodes. Of this ſentiment are Suidas, Calepine, Munſter, &c.

The baſis that ſupported it was of a triangular figure: its extremities were ſuſtained by ſixty pillars of marble. There was a winding ſtair-caſe to go up to the top of it; from whence one might diſcover Syria, and the ſhips that went to Egypt, in a great looking-glaſs that was hung about the neck of the ſtatue. This enormous ſtatue was not the only one that attracted attention in the city of Rhodes. Pliny (l. xxxiv. c. 37.) reckons 100 other coloſſuſes not ſo large, which roſe majeſtically in its different quarters. Beſides theſe, here were to be ſeen five others, the work of Briaxis, and repreſenting divinities. Among the antiquities of Rome, there were ſeven famous coloſſuſes: two of Jupiter, as many of Apollo, one of Nero, one of Domitian, and one of the Sun.

COLOSTRUM, or Colostra, in *Medicine*, the firſt milk of any animal after bringing forth young, called in common *beaſtlings*.

It is remarkable that this milk is generally cathartic, and purges off the meconium; thus ſerving both as an aliment and medicine.

The ſame name is likewiſe given to a diſeaſe which this thick coagulated milk ſometimes occaſions.

An emulſion prepared with turpentine, diſſolved with the yolk of an egg, is ſometimes alſo called by that name.

COLOSVAR or Clausenburg, in *Geography*, the *Zeugma* of the ancients, by the Hungarians called *Koloſvar*, and in Latin *Claudiopolis*, a town of Tranſylvania, ſeated on the firſt branch of the river Samos, and ſurrounded by an ancient thick wall, where the ſtates of the province uſually aſſemble. The univerſity was ſuppreſſed in the year 1782. The Unitarians, who formed one of the ſects received in Tranſylvania, eſtabliſhed their principal ſeat in this place: 255 miles E.S.E. from Vienna, and 45 N.N.E. from Belgrade. N. lat. 46° 57′. E. long. 22° 21′.

COLOT, Germain, in *Biography*, a famous lithotomiſt, of the 15th century, practiſed ſurgery at Paris, during the reign of Lewis IX., from the year 1461 to 1480, and was in great favour with that prince. He was the firſt regular bred ſurgeon who practiſed lithotomy. The operation before his time had been engroſſed by perſons practiſing no other part of ſurgery. Regular practitioners had probably been deterred from interfering in the buſineſs, from reverence to the authority of Hippocrates, who obliged his diſciples to ſwear they would not perform the operation, "Nec vero calculo laborantes ſecabo." He ingratiated himſelf with ſome of the itinerant practitioners, ſaw them perform the operation, and began with cutting dead bodies. Having communicated his ideas to the phyſicians of the court, they obtained leave from Lewis, that he might operate on a condemned criminal, who was attacked with the ſtone in the bladder. The criminal conſented, on the condition promiſed, that he ſhould be pardoned the crime he had committed. The operation was ſucceſsfully performed, the patient recovering, it is ſaid, in fifteen days. Colot obtained great reputation by the cure, which was rewarded by a penſion from his ſovereign. The time of his death is not known. Eloy. Dict. Hiſt.

Colot, Laurence, a deſcendant of Germain, from whom he acquired the art of cutting for the ſtone, was in great reputation, in the early part, and to the middle of the 16th century, for his ſkill in performing the operation, by what is called the greater apparatus. By this method the urethra and neck of the bladder are neceſſarily cut through, which ſubjected the patients, not unfrequently, to fiſtula, and other inconveniences, yet by his dexterity in operating theſe accidents were often avoided, which gave him ſo much credit, that he was ſent for to viſit patients in Flanders, and other diſtant countries. To retain him in France, Henry II. made him his ſurgeon in ordinary in the year 1550, rewarding him with a penſion, adequate to the loſs he ſuſtained, by being prevented viſiting patients in foreign countries. He alſo created for him the poſt of lithotomiſt to the royal family, which was continued to three of his deſcendants. Philip, the laſt of them, died in 1656, aged ſixty-three years.

Colot, Francis, ſon of Philip, appears to have inherited, with the name, the ſkill and dexterity of his anceſtors, in performing the operation of lithotomy. He left a treatiſe on the operation, which was publiſhed in 1727, under the title of "Traite de l'Operation de la taille, avec des obſervations ſur la Formation de la Pierre, et les Suppreſſions d'Urine," 12mo. Paris. In this work he gives a ſhort hiſtory of the method of operating by the greater apparatus. It was invented, he ſays, by John de Romanis, a phyſician of Cremona, in Italy, in 1525, and by him communicated to Marianus Sanctus, who inſtructed Octavian de Villa, a ſurgeon at Rome. Marianus publiſhed, in 1535, "Libellus Aureus, de lapide e Veſica per inciſionem extrahendo," 8vo. Venet. Of Octavian de Ville, who was ſeveral times called to France, to perform the operation, Laurence Colot is ſuppoſed to have obtained ſome valuable information on the ſubject, which contributed much to the celebrity he afterwards enjoyed. The method of operating by the greater apparatus has been long ſince abandoned for a more ſimple and eaſy operation, therefore called, by the leſſer apparatus, firſt diſcovered, Mr. Sharp ſays, by Mr. Foubert, an ingenious French ſurgeon, but much improved by Mr. Cheſelden, in which the urethra and neck of the bladder are avoided by the operator: with Francis Colot, the celebrity of the family, ſeems to have been extinguiſhed. Eloy. Dict. Hiſt.

COLOUR, or Color, from the Latin, *color*, in *Philoſophy*, means that property of bodies which affects the ſight only; thus the graſs in the fields has a green colour, blood has a red colour, the ſky generally appears of a blue colour, and ſo forth; nor can thoſe colours be diſtinguiſhed by any of our other ſenſes, beſides the ſight. The variety of colours, as they are preſented to us by the ſubſtances that ſurround us, is immenſe, and from them ariſes the admirable beauty of the works of nature in the animal, in the vegetable, and in the mineral kingdom, or, more properly ſpeaking, in the univerſe. The ſcience, which examines and explains the various properties of the colours of light and of natural bodies, and which forms a principal branch of optics, has been properly denominated *chromatics*, from the Greek word, χρωμα, which ſignifies *colour*. We ſhall, however, ſtate this theory in the preſent article, as being much more obviouſly recurred to by thoſe perſons who wiſh to be informed on the ſubject. A diſtinct idea of what is meant by the word *light*, may be eaſily formed by its contraſt with darkneſs, which is a privation of light. With our eyes ſhut we have darkneſs; if we open our eyes, whatever we perceive through them is occaſioned by the agency of light, and the various colours of bodies are parts of that light.—It has ſometimes been pretended by certain ignorant perſons, that they could diſtinguiſh colours by the touch; but the teſtimony of divers intelligent perſons, who have had the misfortune of being blind, in conſequence of which their touch has, from neceſſity, become very exquiſite, has conſtantly contradicted thoſe vain aſſertions. Beſides, it will appear from the following theory of colours, that to diſcriminate colours by the touch is utterly impracticable. There are indeed certain pigments of common uſe in painting, which, either from their roughneſs, ſmoothneſs, unctuoſity, or other quality, may affect the touch, and with a little practice a perſon may learn to diſtinguiſh the feel of vermillion which looks red from that of ſap-green, which looks green, and ſo forth; but this is not the art of diſtinguiſhing colours by the touch. It is only the art of diſtinguiſhing certain peculiarities of ſurface. In fact if two pigments exactly of the ſame texture (and ſeveral ſuch there are) but of different colour, be preſented to the fingers of a man with his eyes ſhut, he will pronounce them to be exactly of the ſame colour.

The queſtions which naturally occur to the human mind in the contemplation of colours, are, whence do they derive their origin?—Are they produced by the coloured bodies themſelves, or by ſomething external?—Do they move from the coloured bodies to our eyes, and ſtrike upon them, or enter them; or are they owing to ſome medium interpoſed between the various bodies of the univerſe?—Are they material or not?

The ideas entertained by the ancients concerning the nature of colours, were moſtly wild and abſurd; nor has the preſent theory, imperfect as it is, been formed without an innumerable variety of experiments, obſervations, and the concurring inveſtigations of a great many ingenious perſons. The followers of Pythagoras called colour the ſuperficies of bodies; Plato conſidered it as a flame iſſuing from them; Zeno called it the firſt configuration of matter; and Ariſtotle ſaid it was that which rendered bodies actually tranſparent. We need not add a formal refutation of thoſe extravagant ideas, which were the mere offſpring of the imagination, unſupported by experience and by reaſon. The philoſophers of thoſe times paid little or no regard to experiments; hence they made no diſcoveries or improvements worthy of being recorded. A long and unprofitable period of nearly 2000 years elapſed, from the commencement of philoſophical ſtudies in Greece, until about the time of Deſcartes, when the revival of learning in Europe renewed with additional vigour the enquiries concerning the nature of light and colours. And it is curious to obſerve by what ſmall ſteps, and what circuitous ways, any uſeful diſcoveries were made. See Prieſtley's hiſtory of viſion, light, and colours. Deſcartes conſidered colour as a modification of light, and he attributed the difference of colour to the prevalence of the direct or rotatory direction of light. Grimaldi, Dechales, and others, ſuppoſed that a certain elaſtic medium of a peculiar kind filled the univerſe, and that the differences of colour depended upon the quick or ſlow vibrations of that medium. Rohault imagined that the different colours were produced by the rays of light entering the eye at different angles with reſpect to the optic axis. And Dr. Hook imagined that colour is cauſed by the ſenſation of the oblique or uneven pulſe of light; which being capable of no more than two varieties, he concluded there could be no more than two primary colours. Such were the ideas of philoſophers reſpecting the nature of colours, when Sir Iſaac Newton began to examine the ſubject in his cautious experimental manner, by which means, about the year 1666, he diſcovered the foundation of a theory of colours, which has been juſtly adopted and admired by his contemporaries, as well as by the preſent ſucceeding generation.—Rays of light iſſuing from a luminous object, proceed in ſtraight lines as long as they paſs through a uniform medium. If they meet with a tranſparent medium of different denſity, they will alſo proceed through it in ſtraight lines, provided they enter that medium in a direction perpendicular to its ſurface, otherwiſe they are cauſed to bend their courſe, ſo that beyond the abovementioned ſurface they proceed in ſtraight lines alſo; but theſe ſtraight lines form a certain angle with the ſtraight lines of their direction before they entered the laſt medium. The bending of the rays is called the *refraction* of light, and the angle that has been juſt mentioned is called the angle of refraction. See REFRACTION. Newton, having preſented a glaſs priſm, or kind of wedge, to the light of the ſun, which entered a dark room through a ſmall hole, found not only that the rays were bent from their courſe, *viz.* refracted, but he likewiſe obſerved that the image of the ſun was thereby conſiderably elongated; and this elongated image inſtead of appearing of a uniform bright white light, was reſolved into a ſeries of colours, which exactly reſembled the colours of the rainbow. This elongation of the ſolar image thus formed, is called the diſperſion of light. Theſe colours paſs from one to the other by very ſmall, and altogether imperceptible gradations; ſo that it is impoſſible to ſay where one begins and the next ends. Various methods have been tried for the purpoſe of rendering the colours of this priſmatic ſpectrum more limited and diſtinct; none, however, has been attended with complete effect. The following ſeems to be the beſt method. Let the light of the ſun paſs through a hole of about one-tenth of an inch in diameter, into a dark room. Place a ſcreen at a little diſtance from the hole (for inſtance ſix or ſeven inches) within the room, and let the middlemoſt part of the light paſs through a ſimilar hole in the ſcreen; the object of which is to prevent, in great meaſure, the ſcattered light or penumbra, on the ſides of the ſpectrum. Let the light then fall perpendicularly upon a convex lens; at the diſtance of about 10 feet, by which means a defined image of the ſun will be formed upon a ſcreen placed at the focal diſtance of the lens. Now, if a priſm be placed cloſe to the lens, ſo that the light, after having paſſed through the lens, may paſs through, and be refracted by, the priſm; then a coloured ſpectrum will be formed upon the ſcreen. The long ſides of this ſpectrum are very well defined; but its narrow terminations are ſemicircular, and its whole length conſiſts of circular coloured images of the ſun intermixed with each other, eſpecially about the middle or axis of the ſpectrum; yet the moſt predominant colours are more diſtinguiſhable from each other, eſpecially towards the ſides of the ſpectrum, ſo that their boundaries may be marked with tolerable accuracy. The glaſs priſm fit for this experiment muſt be well formed, and free from veins, ſcratches, bubbles, &c. Thoſe principal colours are ſeven in number, *viz.* red, orange, yellow, green, blue, indigo, and violet. They do not occupy equal ſpaces in the ſpectrum; but for the proportion of their breadths, and likewiſe for a more accurate deſcription of the priſmatic experiments on light, ſee the article REFRACTION.

The above deſcribed experiment with the glaſs priſm gave ſir Iſaac Newton reaſon to conclude that the white light of the ſun conſiſted of ſeven colours, which had different powers of being refracted, ſo that the red rays were refracted leſs, the orange a little more, the yellow ſtill more, and ſo on; hence the image of the ſun was converted into an oblong variegated ſpectrum. In confirmation of this theory Newton inſtituted a variety of other experiments, which were attended with remarkable reſults, and the principal of them are as follows:

If the light which has been refracted and diſperſed by a priſm, be received again upon another priſm which muſt be ſituated in a direction perpendicular to that of the former; the ſpectrum will by that means be removed from its original ſituation into a lateral one; but its breadth and its colours will remain unaltered. Now if the elongation of the beam of white ſolar light, and its reſolution into different colours, were a modification of light produced by the priſm only; then the ſecond priſm ought to expand the ſpectrum in breadth, ſo as to form a quadrilateral figure of equal ſides; but inſtead of that we find that the colours and their breadths remain unaltered.

If the refracted and diſperſed beam of ſolar light, be received upon a concave reflector, the different coloured rays will be reflected to a focus, where they will form a white or colourleſs image of the ſun. But if any of the colours be ſtopped by the interpoſition of a wire, or other ſlender and opaque body between the priſm and the reflector, then the image will become coloured with ſome mixture of colours. This proves that white light conſiſts of coloured rays, intermixed in a certain proportion, and that by a mixture of the rays of the ſeven primary colours in that due proportion, white light is produced. Therefore, white ariſes from a certain mixture of colours, and blackneſs ariſes from a ſtoppage or abſorption of all colours. This property of light and colours, may be familiarly illuſtrated by the following experiment: Divide the flat ſurface of a wheel, or the upper flat ſurface of a top, ſuch as boys uſe, by means of lines going from the centre to the circumference, into ſeven parts, having the ſame proportion that the breadths of the colours have in the priſmatic ſpectrum, and let thoſe portions be pointed reſpectively with the ſeven colours. This done, if you ſpin the wheel or the top, ſo as to cauſe it to turn very faſt, in the light of the ſun; you will find that the painted ſurface will look white; for by the quick motion of the wheel, the impreſſions of the colours in the eye become mixed, and of courſe they form a white light. Stop the wheel and the ſeven colours will appear very diſtinct.

If, when a ſpectrum is formed by the light which has paſſed through a priſm upon a ſcreen, a ſmall hole be made through the ſcreen, and the rays of one colour only be permitted to paſs through it on the other ſide of the ſcreen; then whatever is viewed in that homogeneous light, will appear of that particular colour. Thus, if the red light only has paſſed through the hole, then blood, or graſs, or milk, &c. viewed in that light behind the ſcreen, will all appear red; excepting that the blood will appear of a ſtronger red colour than the graſs or the milk. If the blue light only has been tranſmitted through the hole; then the abovementioned ſubſtances will all appear blue; and the like muſt be underſtood of the other homogeneous colours. This proves that the colours, which ſeem to proceed from coloured bodies in general, do not belong to thoſe bodies; but they are the component parts of the white light, in which thoſe bodies are viewed, and that certain bodies have the property of abſorbing ſome of thoſe coloured rays of the white light which falls upon them, and of reflecting others. Thus, graſs reflects the green rays and abſorbs the reſt, hence, the green rays coming to our eyes, render the appearance of graſs green; thus blood abſorbs every other coloured ray excepting the red, and ſo forth. Black bodies abſorb all the ſeven coloured rays, and white bodies reflect them all.

If two holes, at about a foot diſtance from each other, be made in the ſhutter of a dark room, and two priſms be uſed, *viz.* a priſm be placed to receive the light at each hole, two ſpectrums will thereby be formed upon the ſcreen; and by turning the priſms gently round their axes, the ſpectrums may be cauſed to fall one upon the other. Let the yellow of one ſpectrum fall upon the blue of the other, and at that place the mixture of thoſe two colours will appear green. Let a ſmall hole be made exactly at that place, and that green light will paſs through the hole behind the ſcreen, and will form a green circular image upon another ſcreen placed to receive it. Now, if exactly behind the perforation of the firſt ſcreen, you fix the refracting angle of a priſm, then the image upon the ſecond ſcreen will not only be moved from its place, but will appear oblong, with a yellow border at one extremity, and a blue border at the other extremity; for that ſpot or image of the ſun conſiſts of two primitive colours of different refrangibilities. The ſame thing muſt be underſtood of any other colour formed from a mixture of any two primitive priſmatic colours; for any two of thoſe colours will form, or rather will look like an intermediate colour; thus, red and yellow form an orange, blue and violet form an indigo, and ſo forth.

If the experiment be performed with one ſolar ſpectrum: *viz.* a ſingle priſmatic colour; for inſtance the green be permitted to paſs through a hole in the ſcreen, and be then received upon another ſcreen, the image will be of the ſame colour as in the preceding experiment, *viz.* green, and circular. Now, by placing a priſm behind the perforation of the firſt ſcreen, the green image will be moved from its place, but it will not be elongated nor altered in colour, becauſe this image conſiſts of one uniform primitive colour. (Newton's Opt. b. i. p. ii. prop. iv.) This remarkable experiment ſhews, that though a green may be formed from a combination, or any other priſmatic colour may be formed from a combination of the two adjacent colours; yet each of thoſe colours in the priſmatic ſpectrum, is a primitive uniform or homogeneous colour.

Notwithſtanding the conviction which naturally attends the reſult of the above-mentioned experiments, ſeveral perſons have ſuppoſed that the primitive colours of light are not ſeven, but three only; namely, red, yellow, and blue; and they have been led to this ſuppoſition, by obſerving that the painters can produce all the other colours, by mixing either all thoſe three colours together, or two of them, in due proportion.

A recent writer of eminence in the philoſophical world, (M. C. A Prieur) has ſtarted another theory. He thinks that the primitive colours. (*viz.* the components of white light) are three in number; but he ſuppoſes them to be the red, the green, and the violet; and that the other colours of the ſpectrum are formed from a mixture of thoſe; that is the yellow from the red and the green, the blue from the green and the violet, &c. See l'Annales de Chimie, Sept. 1806.

Hitherto we have treated of the formation of colours by refraction; from which it appears that the white ſolar light conſiſts of coloured rays; that whenever that light enters a tranſparent medium in an oblique direction, it is cauſed to deviate from its rectilinear courſe; and at the ſame time its component coloured rays, are ſeparated in conſequence of their different refrangibility. The next ſeries of facts, upon which the theory of colours depends, relates to the *inflection* of light, it having been found, that the rays of light are bent in their courſe, and reſolved into their component colours, not only by refraction, but likewiſe by merely paſſing by the ſurfaces of bodies. It ſeems that the rays of light are attracted by bodies, when they come within a certain diſtance of their ſurfaces, and that the coloured rays of white light being attracted more or leſs, are ſeparated from each other. A great variety of experiments relating to this inflection of light, were originally made by Newton, and have, ſince his time, been inſtituted by other able philoſophers. But, though ſeveral remarkable facts have been diſcovered; yet the preſent ſtate of knowledge does not admit of their being reducible to a ſingle principle, or to any general and comprehenſive laws.

In order to give our readers ſome idea of this property of light, we ſhall now ſubjoin an experiment related by a recent anonymous writer; referring, then, the reader to the article *Inflection of* LIGHT, for a full account of whatever belongs to it.

"Acroſs a beam," ſays the above-mentioned author, "of ſolar light, admitted into a dark chamber, through a ſmall hole in a thin piece of lead, nearly $\frac{1}{50}$ of an inch wide, I interpoſed a hair of a man's head, and receiving the beam on a ſcreen, or ſheet of white paper at a diſtance, and with an obliquity convenient for the purpoſe, I noted the following appearances.—At the termination of what may be conſidered as, and therefore may be called, a ſhadow, whoſe intenſity or darkneſs was not conſiderable; the following orders and diſtinctions of colours appeared. Firſt, and neareſt to the dark or black parts of the ſhadow, might be ſeen a diluted blue, changing into a breadth of white light, followed by breadths of yellow and red. To theſe ſucceeded an interval of diluted ſhade, then breadths of diluted violet, blue, diluted green, yellow, red; then green diluted yellow, red; diluted green, red; white, diluted red; and finally white light. Theſe are the more general orders of the colours. Of theſe orders, the three firſt were ſufficiently obvious and diſtinct; the laſt evaneſcent and requiring accommodation of circumſtances to produce, and attention to perceive them." Obſervations concerning the Inflection of Light, &c. London 1799.

The laſt ſet of facts that remains to be mentioned, as relating to colours, conſiſts of the phenomena exhibited by thin tranſparent bodies, eſpecially by thoſe of variable thickneſs. Every perſon muſt recollect to have ſeen the bubbles of a ſolution of ſoap, or of other thickning ſubſtance, exhibit a variety of colours ſimilar to thoſe of the ſolar ſpectrum, or of the rainbow. Theſe bubbles are nothing more than thin veſicles of the ſolution, whoſe thickneſs varies continually. But a variety of thin ſolid ſubſtances exhibit the like phenomenon, ſuch as plates of muſcovy glaſs, or of talc; thin plates of glaſs; metallic and glaſs plates moiſtened with a variety of fluids, &c. Newton took two object-glaſſes of teleſcopes, one of which was a plane convex, and the other a double convex one. He laid the latter on the flat ſide of the other, and preſſed them gently. Inſtantly circles of colours appeared about the point of contact, which increaſed and decreaſed both in number and in ſize, according as the lenſes were more or leſs forcibly preſſed againſt each other. The central ſpot was black, and circles of colours appeared round this ſpot, which were brighter near it than farther off. Their order, commencing from the black ſpot, was blue, white, yellow, red; violet, blue, green, yellow, red; purple, blue, green, yellow, red; green, red; greeniſh, blue, red; greeniſh, blue, pale red; greeniſh, blue, reddiſh, white. (Newton's Optics, b. ii. p. 1. Obſerv. iv.) Experiments ſimilar to the above have alſo been performed with flat glaſſes, lenſes of various curvatures, and other ſubſtances, by other philoſophers, ſuch as Moraldi, Grimaldi, Deliſle, Mairan, Mazeos, Du Tour, Muſchenbroeck, &c. See an account of their experiments in "Prieſtley's Hiſt. of Viſion, Light, and Colours." p. 6. ſect. 6. After the above ſuccinct account of the principal experiments that have been inſtituted, and the various important diſcoveries that have been made, concerning the nature of light and colours; it is proper to obſerve, that the ſubject is not only very far from being exhauſted; but that the theory ariſing from thoſe experiments and diſcoveries is doubtful in almoſt all its parts. The number of primitive colours diſtinct from one another, if ſuch do really exiſt, is not quite determinate; the attraction between the rays of light and other bodies is an hypotheſis not clearly underſtood; for it is a prevailing opinion with ſeveral philoſophers, that the rays of light are attracted within a certain diſtance, and repelled beyond that diſtance. The reflection of coloured rays from the ſurfaces of bodies is likewiſe involved in much uncertainty; it being unknown whether the reflection takes place at the very ſurface, or at a little diſtance beyond it by ſome power inherent in bodies, or, laſtly, from ſome other ſurface a little within the bodies, which ſuppoſition is founded upon the hypotheſis that all bodies are tranſparent, as far as a very ſmall part of their bulk, which hypotheſis is founded upon the obſervation that ſeveral denſe and opaque bodies, when much attenuated, become, in ſome meaſure, tranſparent; and ſuch is the caſe with gold leaf, which, when placed againſt the light, appears of a greeniſh caſt.

Notwithſtanding this uncertainty reſpecting the theory in general, the following particulars ſeem to be ſufficiently eſtabliſhed; namely, that by refraction and inflection the white light of the ſun is reſolved into coloured light. Here it may be naturally aſked whether the light of other luminous objects is not reſolved, by the like means, into the ſame colours? The obſervations made in relation to this particular are not ſo numerous, nor ſo exact as might be wiſhed; it appears, however, that ſome luminous objects yield rays of particular colours more abundantly than of other colours. The abbé Rochon having placed a priſm before an achromatic teleſcope, obſerved through it the light of the ſtars; and found that the white light of Sirius was reſolved into an oblong ſpectrum, which conſiſted almoſt entirely of three colours, *viz.* red, green, and violet. An indication of yellow was barely diſcernible between the two firſt, and a ſlight degradation between the two laſt. Through Dr. Herſchell's powerful teleſcopes moſt of the fixed ſtars ſeem tinged with peculiar colours, *viz.* ſome evidently incline to a green, others to a red, and ſo forth. The light yielded by particular combuſtibles is alſo tinged with peculiar colours, and the flame of ſpirit of wine is a ſtrong inſtance of this nature; for if common ſalt be mixed with the ſpirit, the light of its flame ſeems to be entirely deſtitute of red, yellow, and violet, and it is owing to this peculiarity that children frequently play with it in order to give a ghaſtly appearance to the ſurrounding company. When baryt (ponderous earth) is mixed with ſpirit of wine, its flame is yellow; boracic acid renders it green, and ſtrontian earth gives it a purple colour.

The phenomena of coloured bodies, as they occur to us, in general, may be diſtinguiſhed into five claſſes, *viz.* 1ſt. The colours that ariſe from evident refraction, ſuch as the colours of the rainbow, of the bubbles of a ſolution of ſoap, &c. 2dly. Thoſe of opaque bodies that are fixed. 3dly. The colours of tranſparent bodies formed by the light paſſing through them. 4thly. The colours that are changeable, according to the ſituation of the eye, like the colours of certain ſilks, feathers, flowers, thin laminæ, &c.; and 5thly. Thoſe which are changeable in conſequence of a chemical alteration of the nature of the body. We ſhall now add a few obſervations reſpecting each of thoſe five claſſes.

1. That in paſſing through a tranſparent medium, like the drops of rains, the thin pellicle of a bubble of ſoap, a thin lamina of talc, &c. the light ſhould be decompoſed or rather reſolved into colours, is eaſily underſtood, after the above-mentioned properties of the priſmatic ſpectrum; but the only circumſtance which may require explanation is, that we perceive the colours, &c. not when the refracting body is between us and the luminous object, but when both our eyes and the luminous object are on the ſame ſide. With reſpect to this, it muſt be obſerved, that a tranſparent body, like a plate of glaſs, a drop of water, &c. reflects with both its ſurfaces at the ſame time that it lets part of the light paſs quite through its ſubſtance. Direct your eyes to the ſurface of a common glaſs plate ſo as to ſee the reflection of an object, as in a looking glaſs, and if you obſerve attentively you will perceive two reflected images cloſe to each other, *viz.* one from the anterior, and the other from the poſterior, ſurface. In moſt looking glaſſes, if you place a lighted candle on one ſide, and view the reflected image of it from the other ſide, you will generally ſee a ſucceſſion of images of the candle fainter and fainter, in proportion as they recede from the principal image. The reaſon of this appearance is, that ſince both ſurfaces reflect, the image formed by the reflection of the poſterior ſurface is partly tranſmitted to the eye of the ſpectator, and partly reflected from the anterior ſurface to the poſterior one, the latter of which is again reflected, and ſo on. Now, in the caſe of the drops of rain, when they form the rainbow, the light of the ſun falling obliquely on the ſurface of the drop is refracted and reſolved into colours, in which ſtate it proceeds through the drop to its farther ſurface, from which it is partly reflected to the eyes of the ſpectator. The ſame explanation is evidently applicable to the colours of the bubbles of ſoap, thin tranſparent laminæ, and the like. See Rainbow.

2. The fixed colours of opaque bodies are in all probability owing to their abſorbing ſome of the coloured parts of white light and reflecting others; their immenſe variety ariſing from a mixture of the reflected primitive colours in various number and proportion; but it is impoſſible to ſay at preſent whether that reflection is effected at the very ſurface, or at ſome diſtance from it, either within or without the body; alſo to what cauſe the diſpoſition of reflecting certain colours in preference to others may depend upon. Mr. Delaval's experiments ſeem to indicate that the colour of opaque bodies ariſes from the light that has paſſed through a thin layer of tranſparent coloured particles, and is then reflected by the ſmooth ſurface immediately under them.

3. The greateſt number of accurate experiments, concerning the colours of tranſparent bodies, was made by Edward H. Delaval, eſq. F.R.S. (See his Paper in the Memoirs of the Lit. and Philoſ. Society of Mancheſter, vol. ii.) His experiments were performed with an immenſe variety of liquors differently tinged by metallic ſolutions, decoctions, and infuſions of flowers, reſins, gums, woods, mineral and animal matters. Thoſe liquors he placed in phials of flint glaſs, of a parallelepiped form, with an oblong cylindrical neck. "I covered," he ſays, "the bottom, and three of the ſides of each of theſe phials, with a black varniſh; the cylindrical neck and the anterior ſide, except at its edges, were left uncovered."

In order to examine what colour thoſe liquors would exhibit, either by tranſmitted or by reflected light, he viewed them through the neck of the phials, or looked into the phial through the ſide which had been left uncovered by the varniſh. But with reſpect to this latter caſe, he ſays, "the uncovered ſide of the phial ſhould not be placed oppoſite to the window, through which the light is admitted; becauſe in that ſituation the light would be reflected from the farther ſide of the phial, and would be tranſmitted through the coloured liquor; and it is obſervable that ſmooth black ſurfaces reflect light very powerfully. Now, as it is a principal object in the experiment that no light be tranſmitted through the liquors, this will be accompliſhed by placing the uncovered ſide of the phial in ſuch a direction that it may form a right angle with the window."

All the coloured liquors, which Mr. Delaval tried in the above-mentioned manner, appeared tinged with their peculiar colours, when viewed through the necks of the phials; but when he looked on that part of the liquor which filled the body of the phials, he perceived no colour whatever, the whole appearing black; which proves an important fact, namely, that tranſparent coloured liquors do not yield any colour by reflection, but by tranſmiſſion only. "If theſe liquors," he obſerves, "are ſpread thin on any white ground, they appear of the ſame colours which they had exhibited when viewed in the necks of the phials; as the light reflected from the white ground is, in this caſe, tranſmitted through the coloured medium. But when they are ſpread upon a black ground they afford no colour. The black ground, however, ſhould not be a poliſhed body; as the light reflected thereby would be tranſmitted through the thin medium on its ſurface, and be tinged by paſſing through it."

Next to the above, Mr. Delaval relates various other experiments which he made with tranſparent ſolids, *viz.* with coloured glaſſes, which he made on purpoſe, by tinging the ſubſtance of the glaſs with metallic and other matters, in imitation of real gems. Theſe coloured glaſſes exhibited phenomena ſimilar to the coloured fluids. "Having," this author ſays, "formed pieces of ſuch glaſſes, about two inches thick, I incloſed all their ſides with black cloth, except at their farther and anterior ſurface. Each of theſe pieces of glaſs vividly exhibited its colour, when viewed by tranſmitted light: but when the tranſmitted light was intercepted, by covering the farther ſurface, the anterior ſurface afforded no colour, but appeared black. When plates of tranſparent coloured glaſs, ſomewhat thicker than window glaſs, are viewed by tranſmitted light, it is well known that they exhibit their ſeveral colours. I intercepted the light, which was tranſmitted through ſuch coloured plates, by fixing a piece of black cloth contiguous to their farther ſurface. The plates, thus prepared, when placed in ſuch a direction that they form a right angle with the window, appear perfectly black; which ſhews that the coloured particles do not reflect any light."

It is hardly neceſſary to obſerve that wherever light is tranſmitted through any coloured tranſparent body, a greater part of it is loſt, than when that body is quite colourleſs; for by tranſmitting one ſort of coloured rays more copiouſly, it ſtops a great part of the oppoſitely coloured rays.

Beſides theſe tranſparent coloured bodies which have been juſt noticed, there is a vaſt gradation of others between them and thoſe that are perfectly opaque. Theſe, which are called ſemipellucid, or ſemitranſparent, exhibit a vaſt variety of phenomena ariſing from the various proportion of the opaque and the tranſparent particles which enter in their compoſition. Thus ſome appear of the ſame colour, whether viewed by tranſmitted, or by reflected light, others exhibit one colour by tranſmitted and another by reflected light; others again appear of various colours, according to their thickneſs, &c. See Newton's Opt. l. i. p. ii. prop. x.

4. The laſt paragraph may, in ſome meaſure, tend to illuſtrate the nature of thoſe coloured ſilks, feathers, &c. which change their colour according to the angle in which they are viewed, and in which the light falls upon them; other circumſtances, however, are concerned in the phenomena of thoſe bodies. Thus the ſurfaces of ſome of them are very irregular, in conſequence of which they reflect with ſome of their particles, whilſt they abſorb moſt of the light with other particles; hence, when by a lateral view, the former or the latter are placed out of the direction of the eye, the colour of the whole appears different from what it does in another point of view. Certain bodies of this ſort may likewiſe be tranſparent to a certain ſmall depth, in which caſe they become viſible partly by reflected and partly by refracted (conſequently decompoſed white) light; hence the eye of the ſpectator muſt, according to its ſituation, ſee ſome coloured rays in preference to others. The phenomena of thoſe changeable bodies, meaning with reſpect to colour according to ſituation, are far from being clearly underſtood; it is moſt probable, however, that in them all, the three principal properties of light are concerned, namely, its reflection, refraction, and inflection.

5. In the practice of various arts, wherein colours are concerned, ſuch as in dyeing, enamelling, painting in oil or water colours, &c. a change in colour of moſt of the materials is commonly obſerved, which is evidently produced by the action of the air, the fire, the oil, or other agent to which the colouring materials are expoſed, and by which they undergo different degrees of chemical alteration in their nature. This obſervation, and a deſire of inveſtigating the nature of thoſe changes, with a view of improving the practical arts dependant upon them, induced ſeveral perſons to try a variety of experiments, and Mr. Delaval, the ſame above-mentioned gentleman, who inveſtigated other branches of the preſent ſubject, became one of the greateſt labourers in this field of inquiry. Were we acquainted with the nature of thoſe particles in bodies which reflect or refract the coloured rays, and had we a ſufficient knowledge of the alterations produced on thoſe particles by the action of different agents or menſtrua, be they oils, acids, air, alkalis, &c. a juſt idea might perhaps be formed of the changes in colour, which muſt ariſe from certain combinations; but as the preſent ſtate of knowledge does not admit the formation of ſuch a theory, the whole muſt reſt upon conjecture, and the practical part muſt depend upon the reſult of particular experiments.

Sir Iſaac Newton thought, that bodies reflect and refract light, by the ſame power in different circumſtances. Alſo, that the forces of bodies to reflect and refract light, are very nearly proportional to the denſities of the ſame bodies, excepting that unctuous and ſulphureous bodies refract more than others of the ſame denſity. In ſupport of this aſſertion he relates ſeveral experiments, the reſult of which he expreſſes in a table, wherein the proportion of the ſines which meaſure the refractions of the ſeveral bodies, the denſities of the bodies eſtimated by their ſpecific gravity; and their refractive powers in reſpect of their denſities are ſtated in ſeparate columns. Mr. Delaval conceived that the denſer ſubſtances ought, by their greater refractive powers, in like circumſtances, to reflect the leſs refrangible rays; and that ſubſtances of leſs denſity, ſhould reflect rays proportionably more refrangible, and thereby appear of ſeveral colours in the order of their denſity. Agreeably to this ſuppoſition he gives inſtances of natural bodies, which differ from each other in denſity, though circumſtanced alike in other reſpects, excepting in their colour, which colour follows the order of their denſity; the denſeſt being red, the next in denſity orange, the next to that yellow, then green, &c. In ſupport of this hypotheſis Mr. Delaval made ſeveral experiments with glaſs tinged by metallic particles, in which the colour of the glaſs, in a great meaſure, correſponded to the denſity, or to the ſpecific gravity, of the metal concerned. But this ſeries of experiments is not extended to that degree, nor is it conducted with that caution, which a confirmation of the hypotheſis demanded. Mr. Delaval alſo inſtituted ſimilar experiments with coloured liquors, in which he endeavoured to ſhew, that by an incraſſation or an attenuation of their particles, their colours may be changed in one order or in the reverſe. His mode of attenuating thoſe liquors was accompliſhed, as he ſuppoſed, by the addition of acids, and that of incraſſating, by the addition of alkalies. But however ſpecious this hypotheſis may at firſt ſight appear, a ſtrict examination of facts will eaſily ſhew the fallacy of it in almoſt all its parts, and ſeveral writers have pointed out ſome of its defects, but none better than Dr. Bancroft, F.R.S. in his "Experimental Reſearches, concerning the Philoſophy of permanent Colours," vol. i. chap. i. In this excellent work, Dr. B. ſhews that Mr. Delaval has not noticed the change of nature, as well as of ſpecific gravity, which the metals undergo by their being expoſed to different degrees of heat, together with the glaſs. He alſo obſerves, that if, according to Mr. Delaval's hypotheſis, the denſeſt bodies are of a red colour, or approximating to it, platina, the heavieſt of all known metals, ought to be red; whereas it is white, like tin, and the lighteſt metals. Alſo gold, the heavieſt metal next to platina, is much farther removed from the red colour than copper, which is much lighter. With reſpect to Mr. Delaval's experiments on coloured liquors, Dr. Bancroft ſays, "inſtead of chooſing and employing mechanical means, which alone are ſuited to produce thoſe effects, and only thoſe effects, he has recourſe to mere chemical agents, whoſe actions in the ways which he ſuppoſes muſt have been almoſt doubtful, though their powers of producing other, and very different effects from what he ſuppoſes, is moſt certain. Mr. Delaval, however, adopting ſir Iſaac Newton's ſuppoſition, that acids always attenuate, and alkalis always incraſſate, prepared what he conſidered as a diſſolving or attenuating liquor; which conſiſted of water with about $\frac{1}{50}$ part of *aquafortis:* and when he wanted to leſſen the diſſolving force of this liquor, inſtead of weakening it by the addition of water (which would certainly have been the moſt obvious and unexceptionable expedient), he choſe to do it, as he ſays, by adding a ſmall quantity of a ſolution of potaſh, or ſome other alkaline liquor, and thereby produced a new compoſition, the effects of which muſt, in many caſes, prove different from thoſe of a mere diminution of the ſuppoſed diſſolving power of the former liquor. And on the other hand, when he wanted to increaſe the force of his acid liquor, inſtead of doing it by a farther addition of *aquafortis* (obviouſly the moſt proper expedient), he recurs to an addition of *oil of vitriol*, an acid poſſeſſing very different properties, and producing very different effects, on a great variety of ſubſtances, and particularly on colouring matters; of which we could eaſily allege hundreds of inſtances, but ſhall content ourſelves with only mentioning what is well known, that even the ſtrongeſt and moſt concentrated oil of vitriol (uſed to diſſolve indigo for dyeing the Saxon blue, &c.) does not deſtroy, or even weaken, its blue colour, though a very weak nitrous acid, or aquafortis, will wholly deſtroy it, and convert the indigo to a dirty brown maſs, of no uſe whatever." For farther obſervations of Dr. Bancroft on Mr. Delaval's Theory of Colours, we refer our readers to his abovementioned work. But with reſpect to the practical part of the ſubject, *viz.* the art of colouring glaſs, porcelain, &c. or the methods of forming pigments, they are requeſted to conſult the articles, PAINTING, ENAMELLING, DYEING, STAINING, CRAYONS, and PIGMENTS.

COLOUR *of the clouds*, is thus accounted for by ſir Iſaac Newton. Concluding from a ſeries of experiments, that the tranſparent parts of bodies, according to their ſeveral ſizes, reflect rays of one colour, and tranſmit thoſe of another, he hence obſerves, that when vapours are firſt raiſed, they are divided into parts, too ſmall to cauſe any reflection at their ſurfaces, and therefore do not hinder the tranſparency of the air; but when they begin to coaleſce, in order to form drops of rain, and conſtitute globules of all intermediate ſizes, theſe globules are capable of reflecting ſome colours, and tranſmitting others, and thus form clouds of various colours, according to their ſizes. Mr. Melville controverts this doctrine, in its application to the red colour of the morning and evening clouds. "Why," he ſays, "ſhould the particles of the clouds become at that particular time, and never at any other, of ſuch a magnitude as to ſeparate theſe colours? And why are they rarely, if ever, ſeen tinctured with blue and green, as well as red, orange, or yellow? Is it not more credible, that the ſeparation of rays is made in paſſing through the horizontal atmoſphere, and that the clouds only reflect and tranſmit the ſun's light, as any half-tranſparent colourleſs body would do? For ſince the atmoſphere reflects a greater quantity of blue and violet rays than of the reſt, the ſun's light tranſmitted through it ought to incline towards yellow, orange, or red; eſpecially when it paſſes through a long tract of air: and thus it is found, that the ſun's horizontal light is tinctured with a deep orange, and even red; and the colour becomes ſtill deeper after ſun-ſet." Hence he concludes, that the clouds, according to their different altitudes, may aſſume all the variety of colours at ſun-riſing and ſetting, by barely reflecting the ſun's incident light as they receive it. Edinb. Eſſ. vol. ii. p. 75. Prieſtley's Hiſt. of Viſion, p. 446, &c.

For the diſtinct propeities, &c. of the ſeveral colours, ſee BLACK, WHITE, BLUE, &c. See alſo RAINBOW, &c.

COLOUR, and **COLOUR**-*Making*, in *Calico-Printing*. The preparation of colours for calico-printing, conſtitutes one great branch of that beautiful art, and involves in it a ſeries of intereſting and important proceſſes. As an art, its operations are more dependent than almoſt any other, on thoſe minute differences and changes in the conſtitution of bodies, which it is the buſineſs of chemiſtry to inveſtigate. Hence that liability to error and uncertainty which, in the hands of the ignorant, pervades many of its proceſſes, though conducted according to long eſtabliſhed and approved formulæ. Our preſent volume would ſcarce ſuffice for the various receipts in which the art abounds; yet, in the following article, we ſhall endeavour to lay down general principles, rather than more practical directions; convinced, that by preſenting our readers with a clear and conciſe theory, deduced from ſuch practical illuſtrations, as may be neceſſary for this purpoſe, we ſhall render them a more acceptable ſervice.

The term *cola*, in calico printing, is applied not only to thoſe vegetable, animal, and mineral ſolutions, which impart their own colour to the cloth on which they are applied, but alſo improperly to thoſe earthy or metallic ſolutions, which, poſſeſſing little or no tingent properties themſelves, yet retain or fix the colours of other ſubſtances, when afterwards applied to the cloth. Thus the acetite of alumine, or printers' red liquor, when pure, is almoſt colourleſs, and only becomes red by the proceſs of dyeing, as will be explained hereafter. The acetite of iron, or iron liquor, in like manner, when uſed of a determinate ſtrength, is called *black colour*, and when weaker *purple colour*, though the cloth impregnated with theſe ſolutions becomes black or purple, only as being raiſed, like the other, in the dye-copper.

1. The colours produced by means of theſe earthy or metallic ſolutions (which, in the language of ſcience, are called *mordants*), form the moſt valuable and important ſeries, whether conſidered with regard to the almoſt infinite variety of ſhades, or to their ſolidity and durability. Theſe colours, from the mode in which they are produced, (the mordant being firſt applied to the cloth, and the colour afterwards raiſed by dyeing); are called *dyed colours*.

2. Sometimes the mordant is previouſly mixed with a ſolution of colouring matter, and in that ſtate applied to the cloth, ſo as to paint or ſtain it, at one operation, and without the proceſs of dyeing. Thus, another claſs of colours is produced, many of them poſſeſſing great brilliancy indeed, but much inferior to the former in durability. The colours called chemical, by calico printers, belong chiefly to this claſs.

3. In the third and laſt claſs, we may place all thoſe where the colouring matter is ſimply held in ſolution by an acid or alkali, and in this ſtate applied to the cloth, without the intervention of any mordant. To one or other of the foregoing claſſes, may be referred all the colours uſed in calico printing; with the exception, however, of thoſe ſyſtems of colours which have been produced by calico printers in this country, within a ſhort period, by proceſſes, and upon principles which have hitherto not been made known.

Claſs I.

The colours of this, as has been already obſerved, are produced, by firſt impregnating the cloth with an earthy or metallic ſolution, or mordant, and raiſing the colour afterwards by dyeing. In this article we ſhall confine ourſelves to the preparation of the different mordants, and the enumeration of colours they afford, with different colouring ſubſtances. The operations of the dye-houſe, and the mode of raiſing the colours in the dye-copper, will be detailed hereafter.

The two great and moſt important mordants uſed in calico printing, are thoſe that we have already noticed, *viz.* the ſolution of iron in acetous acid or vinegar, called iron liquor, and the acetous ſolution of alumine, or the earth of alum, called red liquor, or red colour, and ſometimes yellow liquor.

With theſe two ſolutions, either ſeparately applied, and of various ſtrengths, or mixed together, and in various proportions, an infinite variety of ſhades of colour are produced. Almoſt all the hues in nature may be obtained by raiſing them, and their various combinations with different colouring ſubſtances. From madder, with the acetite of alumine, or red liquor, we obtain various ſhades of red, from the darkeſt blood colour to a pink. From weld and quercitron bark, yellows, varying in intenſity from a deep orange to a pale ſtraw colour, according to the ſtrength of the mordant employed. From logwood, various ſhades of violet; from cochineal, Brazil, and Hicaragua wood, pink and crimſons of different hues; and, in ſhort, from almoſt every different colouring ſubſtance, a different ſhade of colour. With the acetate of iron, or iron liquor, of different ſtrengths, we obtain from madder all the intermediate hues between black and pale purple, or lilac. From weld and bark, olives, browns, and drabs, of various hues; from ſumac, logwood, galls, and other aſtringent ſubſtances, all the varieties of grey, from the paleſt ſhades to the deepeſt, in which all the minute differences of hue are loſt till they approach to black. Theſe various ſhades are further modified by applying two or more colouring ſubſtances to the ſame mordant, as madder and weld, for example, to the acetite of alumine, which produces orange, light cinnamon, nankeen, &c.; and again ſtill further, by mixing the mordants themſelves in various proportions, and raiſing them with either one or more of the different colouring matters. By theſe means ſhades, and varieties of colour, may be produced from a few ſubſtances only, which baffle deſcription, and for which language has no preciſe or definite terms.

The acetite of iron, or iron liquor, is variouſly prepared. In this country it is chiefly made with the pyroligneous acid, which Fourcroy has proved to be identical with the acetous. Malt acid is preferred by many on account of its being free from volatile oil and reſinous matter, with which the other abounds; but the great difference in price, and the facility with which it is obtained, has brought the acid of wood almoſt into general uſe. A ſeries of caſks filled with ſcraps and turnings of iron upon which the acid is poured, is almoſt the only apparatus neceſſary for making iron-liquor; yet when the conſumption is great, or when it is prepared for ſale, vats capable of holding ſeveral hundred gallons are ſubſtituted for caſks, and the acid is kept in a ſtate of circulation through the iron by means of pumps. The ſaturation is much accelerated by this motion, which prevents any depoſition on the ſurface of the iron which might defend it from the action of the acid, and alſo brings freſh portions of unſaturated acid more frequently in contact with the metal. In a few weeks, ſooner or later in proportion to the ſtrength of the acid, the ſaturation is completed, and the liquor is then removed from the vat into caſks for uſe, and freſh acid poured upon the iron as before. This is an eaſy and ſimple mode of making iron liquor, and as it requires but little trouble and attention, is the one moſt generally in uſe. The precautions neceſſary to be obſerved are, that the acid, if it be the pyroligneous, ſhould not be uſed too ſoon after its preparation. It holds much eſſential oil and reſin in ſolution, part of which ſeparates on being kept a few weeks, and the clear acid may then be drawn off. It may be ſtill further freed from reſin by boiling; a portion of eſſential oil is thus thrown off, and the reſin, if held ſuſpended, is precipitated after ſtanding ſome time. We ſhall have occaſion to recur to this ſubject again, when we come to treat of the pyroligneous acid, and its formation, under the article *Diſtillation of* Wood. It is neceſſary alſo, that the iron ſhould be perfectly clean and all of it malleable. Caſt iron is not ſoluble in acetous acid. Hoop iron cut into lengths of from eight to ten inches is preferable to any other. It is readily cleaned and more eaſily taken out of the vat, and returned into it again than miſſhapen maſſes ſold under the name of old iron. When malt acid is employed, ſimple heating and waſhing is ſufficient to free it from any foulneſs it may have contracted in the vat; but when the pyroligneous acid has been uſed, it becomes ſo coated with reſin on its upper ſurface after a ſecond or third ſolution, as to prolong the period of ſaturation to twice or thrice its uſual length. In this ſtate it muſt be removed from the vat and heated to redneſs in oven, through which there is a current of air. The reſin is conſumed, and the iron by heating is freed from any remains of carbonaceous matter that may adhere to it, and is again ready for the vat.

The only objection to this mode of making iron liquor is the time required to ſaturate the acid, which to thoſe, whoſe conſumption is very great, or who manufacture it for ſale, is oftentimes of importance. Different proceſſes have therefore been deviſed to remedy this inconvenience, in many of which the ſaturation is accelerated by means of heat which is applied in various ways, as beſt ſuits the convenience of the manufacturer; but the moſt expeditious mode is that of preſenting the iron to the acid in a ſtate of oxydation, by which means the ſolution is effected immediately. Calico printers have long been in the habit of uſing an extemporaneous acetite of iron, formed by mixing together ſolutions of acetite of lead and ſulphate of iron. A very pure acetite of iron may be obtained by this means, but the price of acetite of lead renders this mode too expenſive for general uſe. By forming a ſolution of lead, however, in pyroligneous acid and decompoſing it with ſulphate of iron or copperas, an iron liquor may be obtained ſufficiently cheap to render this proceſs advantageous in many caſes, though ſtill more expenſive than the ordinary mode. A patent was lately taken out for making iron liquor by a proceſs ſomewhat ſimilar to this, which, however, we underſtand has not anſwered the expectation formed of it. A ſolution of lead in pyroligneous acid is digeſted on clear metallic iron. The iron becomes oxydated at the expence of the lead and is diſſolved, whilſt the lead is precipitated in the metallic ſtate, and may again be uſed for a freſh ſolution. All theſe modes are evidently more expenſive than the ordinary one of ſimple ſolution of metallic iron in pyroligneous acid, and the only conſideration with the manufacturer is, whether this extra expence is counterbalanced by the economy of time or not.

The proceſs adopted ſome years ago by Mr. Thomſon, is perhaps the moſt expeditious, and next to the common mode, the moſt economical of any yet in uſe. It conſiſts in ſaturating the pyroligneous acid with quicklime, and pouring the clear boiling ſolution on as much ſulphate of iron or copperas as will precipitate the whole of the lime. A caſk of iron liquor may be made by this mode in a few hours, and when care has been taken rightly to proportion the ingredients ſo as to produce complete decompoſition, it is inferior to no ſolution whatever in any of its properties.

The properties of the acetous ſolution of iron fit it eminently above all others for the purpoſe of the calico printer, and having detailed its preparation we ſhall endeavour to point out in what this ſuperiority conſiſts.

The acetite of iron exiſts in two ſtates, dependent on the quantity of oxygen combined with the iron. When pure, and recently prepared, it is of a pale greeniſh hue, but by expoſure to air ſoon becomes tinged with brown. In this ſtate the iron is at its loweſt point of oxydation, ſtrongly attractive of oxygen, and if precipitated by an alkali, of a deep green colour. By expoſure to the atmoſphere, and conſequent abſorption of air, the ſolution paſſes to a deep red brown, and, if concentrated, depoſits orange oxyd of iron, and becomes ſtrongly acidulous. With this exceſs of acid, the ſolution now becomes permanent; the iron is almoſt wholly at the maximum of oxydation; and, when precipitated, of a dark red colour.

The ſame takes place only in a leſs degree, and more ſlowly with the ſulphuric and muriatic ſolutions of iron. Of a pale greeniſh hue in their recent ſtate, they gradually attract oxygen from the atmoſphere, and become ſlightly red, depoſit red oxyd of iron and paſs to a ſtate of acidity, at which the ſolution becomes permanent, and the oxydation of the iron proceeds no further.

If the ſolutions, properly thickened with gum or flour, are applied to cloth, the ſame change takes place, but with more rapidity, from their diffuſion over a thin ſurface, and more complete expoſure to the air. The aqueous and volatile part of the ſolution ſpeedily evaporates, and as the oxydation goes on, the oxyd of iron is depoſited on the cloth, and a portion of acid ſet free. When this acid is volatile, as is the caſe with the acetous, and alſo in a great degree with the muriatic, it is diſſipated. The oxydation of the iron then goes on, freſh portions of acid are again liberated and drawn off till the whole of the ſolution is decompoſed, and the oxyd of iron depoſited in the cloth. When the acid is not volatile, however, as is the caſe with the ſulphuric, the firſt portions of acid that are liberated not being drawn off, the oxydation proceeds more ſlowly till the exceſs of acid becomes ſo great as wholly to interrupt it, and great part of the iron in the operation of rinſing is again carried off the cloth. Another and more ſerious inconvenience attending the uſe of the ſulphuric ſolution is its action on the cloth itſelf. The diſengaged acid being in a ſtate of great concentration acts upon its fibres, weakens, and at laſt deſtroys them. The ſame takes place with the muriatic ſolution alſo, for though the exceſs of acid is ſlowly diſſipated, yet it has ſufficient time and concentration to act very powerfully, and is, if poſſible, ſtill more deſtructive than the ſulphuric, ſince its action is not confined to the part on which it is applied, but from its volatility extends over the whole ſurface of the cloth.

It is neceſſary, therefore, that the acid ſhould be not only volatile, but harmleſs in its action on the vegetable fibre, which conditions are more completely fulfilled by the acetous than by any other ſolution whatever. From the preceding obſervations on the properties of the acetite of iron, and the changes it undergoes on the ſurface of the cloth, may readily be deduced the reaſons for that expoſure to heat and air which calico printers have, from long experience, found neceſſary to goods printed with this ſolution. By expoſure to air the iron becomes oxygenated and depoſited on the cloth, whilſt the heat favours the liberation of the acid, and accelerates the proceſs. From what has gone before it may alſo be inferred, that the acetite of iron ſhould be uſed in its recent or *green* ſtate, ſince in that ſtate the acetous acid is capable of holding a greater quantity of oxyd of iron in ſolution, and that conſequently after its ſaturation and removal from the iron, it ſhould not be too much expoſed or agitated in contact with the air. On this account, alſo, it is wrong to pump the liquor in the vats too much when it approaches the point of ſaturation, ſince the oxygenated iron is almoſt all precipitated, and freſh portions immediately diſſolved, ſo that the liquor might in time be rendered quite thick with precipitated oxyd of iron.

The preceding ideas are at variance with the general opinion reſpecting the ſtate in which the acetite of iron ſhould be employed. All the ſpeculative writers, and even many well acquainted with the proceſſes of calico printing, recommend the oxygenation of the ſolution by expoſure to air and removal from the iron, as eſſential to the goodneſs of the iron liquor. Even Berthollet, in the laſt edition of his "Elements of the Art of Dyeing," has fallen into the ſame miſtake, the ſource of which, and the facts which ſeem to countenance it, we ſhall point out in a future article.

It is an object of importance to the calico printer to know the preciſe ſtrength of his iron liquor, and to be able to aſcertain this at all times, with little trouble or chance of error. Great miſchief and inconvenience often ariſes from uncertainty in this reſpect, eſpecially in the pale ſhades of purple, which are obtained from madder, with diluted acetite of iron. The hydrometer has been objected to, as indicating not merely the quantity of iron in a ſolution, but alſo the eſſential oil, reſin, and mucilage which theſe impure ſolutions often contain. This objection, however, only applies where the ſame inſtrument and graduation is employed to aſcertain the relative ſtrengths of iron liquors, prepared with different acids, as the pyroligneous which contains much eſſential oil and reſin, and malt acid which abounds in mucilage. In this caſe the hydrometer may indicate great differences in ſolutions containing equal quantities of acid and iron, but varying in the quantities of mucilage, oil, or reſin. Iron liquor, however, prepared conſtantly by the ſame proceſs, and from the ſame acid, varies ſo little in the relative proportion of its ingredients, that the hydrometer may be uſed to aſcertain its ſtrength in preference to any other mode whatever; provided the neceſſary precautions are uſed to correct any error ariſing from variation of temperature.

In a work of this kind, not illuſtrated by actual ſpecimens, and without reference to ſome particular kind of iron liquor, it is impoſſible to point out the ſpecific gravities of the different ſolutions required for producing the various ſhades, we have enumerated. An acetite of iron, of ſpecific gravity 1.047, with madder or logwood, will produce a black, and with weld or ſumac an olive, and diluted with ſix, eight, or ten times its bulk of water, various ſhades of purple, drabs, or olives, according to the colouring matter employed. A ſtandard ſolution of iron once obtained, the neceſſary ſtrength for producing the different varieties of colour is eaſily aſcertained by actual experiment, and to this we muſt refer our readers.

When thickened with flour or gum, and tinged with a decoction of logwood or Brazil, the better to enable the workman to obſerve the progreſs and ſtate of his work, it forms, as we have before obſerved, the printers black colour, a purple colour, &c. according to the ſtrength of the ſolution and the purpoſe it is intended for. Various ingredients were formerly added to iron liquor, to improve its quality, or vary the hue of colour it produced. Verdigriſe and copperas were added to the ſolution intended for black; and ſal ammoniac or nitre to the diluted ſolutions for purple. Theſe are, however, now almoſt univerſally laid aſide, as being for the moſt part uſeleſs, and often hurtful: the ſimple acetite of iron being found to anſwer every purpoſe of the more complicated and heterogeneous ſolutions.

The *acetite of alumine*, or red liquor, is always prepared by the decompoſition of alum, by an earthy or metallic ſalt, ſince the aluminous earth is not ſoluble in acetous acid, except in its newly precipitated and minutely divided ſtate. The pureſt ſolution, and that which is generally uſed for the fineſt and moſt delicate colours, is produced by decompoſing alum with Dutch ſugar of lead, generally in the proportion of two parts by weight of the former, to one of the latter. The proportion of the two ſalts, and alſo the quantities of each gallon, as uſed by different calico printers, vary yet with little difference in effect. The alum in general predominates ſo far as completely to ſaturate the liquor. The printers' aluminous mordant therefore is a compound ſolution. It is an aceto-ſulphate of alumine, conſiſting of a ſaturated ſolution of common alum, and more or leſs acetite of alumine, according to the quantity of ſugar of lead employed. In the neighbourhood of London, the proportions are 6lb. of alum, and 3lb. of ſugar of lead to a gallon of water: when theſe are completely diſſolved, one ounce of Spaniſh white is added, and the whole briſkly ſtirred till the effervеſcence has in great meaſure ſubſided. In a few hours the ſolution becomes clear, and forms a ſtandard liquor from which, by greater or leſs dilution, may be obtained all the various ſhades of red, yellow, &c. already enumerated. In the above formula the proportion of alum is ſomewhat too great, a part of it remains undiſſolved, or immediately recryſtallizes, and falls to the bottom along with the precipitated lead. This exceſs of alum is however ſtrongly inſiſted on by many calico printers, as eſſential to the purity of the mordant, from an idea that the *pureſt* part of the alum only is taken up in the ſolution. This fact however may be readily diſproved by employing this undiſſolved or recryſtallized alum in the formation of freſh ſolutions, whoſe purity will be found in no reſpect inferior to the former. The purity of the alum and ſugar of lead, and eſpecially their being free from iron, is of great importance in the preparation of this mordant, and on this account the Dutch ſugar of lead is preferred; but its high price renders it too expenſive except for the pale reds of light chintz, and other kinds of work, whoſe great delicacy in the red tints is required. A ſubſtitute for it has been found in the ſolution of litharge in vinegar, or pyroligneous acid, which is afterwards decompoſed by the addition of alum, and the exceſs of acid neutralized by Spaniſh white as in the former caſe. Great part of the acetite of alumine manufactured and ſold under the name of red liquor is prepared in this manner. It is in general uſed for yellows, dark ſhades of red, and for thoſe compound mordants into which the acetite of iron enters, and when its purity is of courſe of little conſequence. The acetite of lime has long been ſubſtituted with great advantage by the writer of this article for the ſolution of lead, and its uſe is becoming daily more known and extended. When carefully prepared, it is ſcarce inferior to the beſt ſugar of lead, and the impure ſolutions anſwer equally with the beſt, for the compound mordants before mentioned. The theory of theſe proceſſes is the ſame in all. The object being to obtain a ſolution of alumine or earth of alum in acetous acid. On mixing acetite of lead, and ſulphate of alumine together, a change of baſes takes place; the ſulphuric acid unites with the lead, and falls down in the form of a white heavy precipitate, whilſt the earth of alum combines with the acetous acid, and remains in ſolution. The ſame takes place with the ſolution of litharge in pyroligneous acid, which is indeed an impure acetite of lead, and when the acetite of lime is employed inſtead of lead, the ſulphuric acid and lime unite and form an inſoluble powder, which ſubſides, though leſs quickly than the other, whilſt the acetite of alumine remains in ſolution above; the addition of the Spaniſh white is neceſſary to ſaturate a ſmall exceſs of acid which exiſts in the ſolution. This exceſs is taken up by the lime, and immediately converted into acetite of alumine, by the decompoſition of a freſh portion of alum.

The acetite of alumine when pure, is almoſt colourleſs. It has a ſlight acetous ſmell, and when boiling throws off acetous acid in great abundance, and depoſits a portion of alumine. When evaporated it acquires a thick gummy conſiſtence, but does not cryſtallize a property which gives it a decided advantage over common alum as a mordant. It unites readily with gum, but when concentrated and holding much alum in ſolution, forms with flour a watery pulpy kind of paſte, which has little adheſion, and from which the fluid ſoon ſeparates. The ſulphuric ſalts have indeed all a diſpoſition to injure the thickening quality of flour.

The affinity of cotton for the earth of alum, is ſo ſtrong as to ſeparate it from its combinations even with the mineral acids. When a ſolution of common alum properly thickened is applied to cloth, a portion of alumine unites with it, and the acid, which held it in ſolution, is ſet free. When this is accumulated to a certain degree, it prevents any further decompoſition, and in rinſing carries off the greater part of the earth again. When the acid however is volatile, like the acetous, and is diſſipated as ſoon as diſengaged, there being no longer any obſtacle, the decompoſition goes on till the whole of the acid is driven off, and the alumine combined with the cloth. In the infancy of calico printing, and before the theory and conſtitution of the different mordants was properly underſtood, a variety of ſubſtances were added to the ſolution, ſome of which are retained to this day. Verdigriſe in the proportion of two ounces to a gallon, is recommended by many as tending to exalt the hue of yellows, and may in ſome caſes be uſeful. Corroſive ſublimate has been but lately laid aſide, and the nitro-muriate of tin was long thought to give fixity and brillancy to reds, when uſed in a ſmall proportion with the aluminous mordant. In general, however, the aceto-ſulphate of alumine is found adequate to every purpoſe of the calico printer; we ſhall not, therefore, perpetuate error by detailing any of thoſe unmeaning mixtures which are ſtill retained by the ignorant and prejudiced. Theſe two mordants, the acetites of iron and alumine, and their various combinations, are thoſe only in general uſe in calico-printing, for producing colour of the firſt claſs. This application is ſo extenſive, and at the ſame time ſo ſimple, as to ſuperſede the neceſſity of any other. The ſolutions of copper are ſometimes uſed as mordants, but they afford colours of little ſolidity. The ſolutions of tin have alſo been employed, but we ſhall ſpeak of theſe and other earthy and metallic ſolutions which have been uſed with partial ſucceſs, when we come to treat of mordants in general.

Claſs II.

In this claſs the colours are produced by combining a ſolution of colouring matter with ſome earthy or metallic ſalt, capable of giving it fixity when applied to the cloth. The mordant and colouring matter are here applied at once, and the cloth is painted, as it were, or ſtained, with the colour it is intended to retain, and requires, in general, no farther operation than that of rinſing, to free it from the paſte or gum with which it was thickened.

The colour of this claſs poſſeſſes, as we have before obſerved, in general great brilliancy, but wants that ſolidity and fixity which characteriſe the colours of the former claſs. The union of the mordant with the cloth is weakened by its previous combination with the colouring matter, and not being favoured by heat, as in the former caſe; the triple combination of vegetable fibre, mordant, and colouring matter, wants that ſolidity which is ſo neceſſary to conſtitute what is called a faſt colour.

Many of theſe, however, are ſufficiently durable to be partially introduced, and intermixed with other colours of greater durability, and ſome are indiſpenſably neceſſary, as no better mode has yet been deviſed of producing them. When the chemiſt's art ſhall have diſcovered means of giving fixity to colours thus topically applied, the art of calico printing will have arrived at perfection. Syſtems of colours may then be combined, which are at preſent incompatible, and the tedious operation of dyeing and bleaching, with their attendant difficulties, be baniſhed from the art. Nor is the hope ſo chimerical as might at firſt be imagined; ſeveral of the moſt uſeful and permanent colours are of this deſcription, as will be ſhewn hereafter.

We ſhall content ourſelves with deſcribing the leading and moſt uſeful colours of this claſs, giving, at the ſame time, the theory of their conſtitution. The mere enumeration of all the varieties that have or may be formed, would be endleſs, and foreign to our purpoſe.

Chemical Black.

This is the moſt uſeful colour of the claſs, and one of indiſpenſible neceſſity in certain combinations of colours, where, for inſtance, it is mixed with drab, olive, and yellow, raiſed in the dye-copper with weld quercitron bark, or any ſimilar colouring matter, and where the preſence of any ſubſtance, ſuch as logwood or madder, capable of producing a full black, would be ruinous to the other colours. A deep olive, approaching to black, might, indeed, be produced, by employing a ſtrong iron liquor, as mordant, and uſing ſumac in the dye-copper; yet as this would bear no compariſon in point of intenſity with the madder or logwood black, and as the force of the colouring in ſuch courſe of work greatly depends on contraſt, the topical or chemical black, which has all the intenſity required, is almoſt conſtantly employed. The conſtitution of this black is pretty nearly the ſame in all the different formulæ in uſe. It conſiſts always of a ſolution of iron combined with a ſolution of colouring matter generally of an aſtringent nature. On the right proportion of theſe two ſolutions, and on their due ſpecific gravity or ſtrength depends, in a great meaſure, the goodneſs of the black.

1. If to a decoction of Aleppo galls, in five times their weight of water, made into a paſte with flour, a ſolution of iron in nitrous acid of ſpecific gravity 1.25 be added, in the proportion of one meaſure of nitrate of iron to eighteen or twenty of the former, a black will be formed fit for almoſt all the purpoſes of calico printing, and poſſeſſing the chief requiſites of this colour, namely, tolerable fixity, and a diſpoſition to work well with the black.

2. In lieu of nitrate of iron, ſome calico printers employ copperas, in the proportion of one pound to a gallon of the decoction of galls. Half the copperas is directed to be diſſolved in the gall-liquor before it is thickened with flour; the remaining half, diſſolved by heat in as much aquafortis as will cover it, is added afterwards. This black has tolerable fixity, but does not work ſo well as the preceding.

3. Copperas diſſolved in various proportions of from four to twelve ounces per gallon, will form, with decoction of galls or logwood, blacks of leſs ſolidity indeed than the former, yet applicable, nevertheleſs, in many caſes where the others are not.

The conſtitution of the two laſt-mentioned blacks differs ſomewhat from the firſt. We ſhall point out this difference, and explain, as conciſely as poſſible, the rationale of the foregoing proceſſes.

When a ſolution of iron in nitrous acid is added to a decoction of galls, as in the firſt example, the ſolution is decompoſed, the iron unites with the gallic acid and tanning principle, whilſt the nitrous acid is diſengaged. This is proved by the blackneſs which the ſolutions aſſume immediately on being mixed. The diſengaged acid, however, ſhortly re-acts on the new compound, the blackneſs gradually diſappears, and in a few days, if the nitrate of iron has been added in proper quantity, the paſte, inſtead of black, is of a dirty olive green. If the proportion of nitrate of iron be greater than $\frac{1}{15}$, this change will be effected ſooner; and if ſo high as $\frac{1}{10}$, the paſte, when applied to the cloth, will be a bright orange, like the acetite of iron. By expoſure to heat and air, this colour generally deepens, becomes grey, and at laſt a full black. In this ſtate it is permanent, and adheres powerfully to the cloth. Theſe changes of colour depend on the ſolution of the tannate and gallate of iron in the diſengaged nitrous acid, and the evaporation of the acid when expoſed to heat and air on the cloth. This ſolution of the tannate and gallate of iron is indeed an eſſential requiſite in the goodneſs of the chemical black. If the diſengaged acid is not ſufficient to effect this, or if it is in too great a ſtate of dilution, the colour has but a feeble adherence to the cloth; it is not preſented in a ſtate favourable to its union with it, ſince the combination into which the iron has entered is inſoluble in water. It lies merely on the ſurface, but does not penetrate its fibres, and yields readily in the various operations to which it is ſubjected. The chemical black, therefore, of the firſt example is a ſolution of the tannate and gallate of iron in nitrous acid.

The black of the ſecond, but more particularly of the third example, differs from the preceding in the circumſtance of the iron in the ſolution being in a leſs oxygenated ſtate. We may conſider this black in its recent ſtate as a mixed ſolution of green ſulphate of iron, and gallic acid, and tanning principle; for the decompoſition of the ſulphate is not complete till by expoſure to air on the cloth the iron becomes fully oxygenated. When this black is recently applied to the cloth, it is of a pale greyiſh colour, has little fixity, ſimple rinſing in cold water being ſufficient to fetch nearly the whole away. By gradually abſorbing oxygen, it becomes deeper, and at laſt black. The ſulphuric acid has no longer any action on it, and is removed in the firſt operation in which it is immerſed in water.

The decoction of galls uſed for chemical black is variouſly prepared. Many calico printers infuſe the galls cold in caſks of vinegar, or pyroligneous acid, ſuffering them to remain ſeveral months, occaſionally drawing off the lower part, and returning it on the galls. Others ſteep them in urine. Both theſe modes are vicious, particularly the laſt. Simple boiling in water, till all the ſoluble matter is extracted is ſufficient, taking care to incloſe the galls in a ſack, that when ſoft they may not render the decoction thick.

Grey.

By diluting the chemical black of the firſt example with once, twice, thrice, &c. its bulk of water, and thickening the ſolution with gum, various ſhades of grey are obtained, which require rinſing off in water only, and the deeper ſhades of which have tolerable permanence.

The theory of theſe mixtures is the ſame as of the black, from whence they are derived. On the addition of water to the olive-green ſolution, mentioned in the preceding article, the colour inſtantly becomes deep purple, approaching to black. This is occaſioned by the dilution of the free acid, which being no longer able to hold the tannate and gallate of iron in ſolution, ſets part of it at liberty, which inſtantly regains its colour. For the reaſon already aſſigned, this has leſs adherence to cloth than that in which the ſolution is more perfect. The addition of a ſmall quantity of nitrous acid effects this. The olive-green colour of the ſolution is reſtored, which, by expoſure to the air, and conſequent evaporation of the acid, diſappears, and leaves the tannate and gallate of iron more firmly fixed on the cloth. The complete precipitation of the combination is afterwards effected in the operation of rinſing off in water.

Yellow.

The falſe or chemical yellows are generally prepared with decoctions of French or Turkey berries, and ſometimes with quercitron bark. The latter ſubſtance produces pale yellows or ſtraw colour, but does not afford the deep bright orange yellow of the berries. Dr. Bancroft, to whom the public is indebted for the introduction and knowledge of this moſt uſeful dyeing drug; indeed, aſſerts the contrary in his work on "Permanent Colours;" and has given a receipt for the bark-yellow, which has, however, never ſucceeded in our hands.

Berry-yellow. Boil two pounds of good berries, ſlightly bruiſed, in a gallon of water during three hours, taking care to replace, from time to time, the evaporated water with liquor obtained from the ſecond boiling of a former quantity of berries. When the liquor is cool, add to it eight ounces of alum, and if it is intended for the block thicken it with flour. If it is meant for thoſe ſmall objects in printed goods, which are generally touched with the pencil, two ounces of ſugar of lead ſhould be added with the alum, and the colour thickened with gum dragon. This yellow is generally paſſed through lime water as the firſt part of the operation of rinſing; by this means the greater part of the earth of alum, which would otherwiſe have been carried off in the operation, is precipitated on the cloth, and the colour conſiderably heightened.

When this operation of liming cannot be performed without injury to ſome other colour, a greater proportion of ſugar of lead ſhould be added. This decompoſes the alum, and forms an acetite of alumine, which being more readily decompoſed by the colouring matter and the cotton than ſulphate of alumine, does not require the aſſiſtance of an alkaline ſolution to precipitate it on the cloth.

The proportion of berries above directed is for a full yellow; one-fourth or one-third leſs will form, with the ſame quantities of ſalts, yellows of great brightneſs. Some calico printers add a ſmall quantity of nitrate of copper to the yellows intended to be ſimply rinſed off without liming. This heightens the colour, but what is gained in intenſity is loſt in brightneſs; for if the ſolution of copper be added in ſufficient quantity to produce any very perceptible effort, it imparts a dulneſs to the hue which is very detrimental. This is the invariable effect of copper in any ſhape, whether the acetite, ſulphate, or nitrate of copper be employed.

Bark yellow. For a lemon or ſtraw colour, it will be ſufficient to make a decoction of bark by boiling from four to ſix pounds in as much water as is neceſſary during two hours, and after evaporating down the decoction to one gallon, add to it two ounces of ſugar of lead, and eight ounces of alum. If not limed, the proportion of ſugar of lead ſhould be doubled. For ſtrong yellows, Dr. Bancroft directs the addition of both nitrate of copper and nitrate of lime in quantities ſo great, as near ſeven ounces of the former to a gallon of colour. Experience, however, though it has done juſtice to the merits of Dr. Bancroft's diſcovery of the uſe of quercitron bark, has not verified the expectations he had formed of it as a ſubſtitute for the Turkey berries in the topical or chemical yellow.

The conſtitution of theſe colours, whether formed with the ſulphate and acetite of alumine, or with the ſolutions of copper is the ſame. Alumine, or the earth of alum, and the oxyd of copper, have an affinity both for colouring matter and vegetable fibre. They form the connecting link between theſe ſubſtances, which would otherwiſe counteract a feeble union. When a ſolution of alum is added to a decoction of berries or of bark, a ſlight precipitation takes place by the union of a portion of colouring matter with the earth; the greater part however remains ſuſpended or held in ſolution by the acid of the alum. When applied to the cloth the farther decompoſition of the ſalt is aided by the affinity of this ſubſtance for alumine, and, when the acid is volatile, as the acetous for example, by its conſequent evaporation. The ſame takes place with the ſolutions of copper. The operation of rinſing farther aids the precipitation of the colouring matter and alumine, by thus largely diluting with water; and laſtly, when the goods are previouſly paſſed through the lime tube, the decompoſition is complete, the laſt portions of earth or oxyd are precipitated, and the colour thereby conſiderably exalted.

The ſolutions of tin are capable of forming very bright and beautiful yellows, with decoctions of different yellow colouring ſubſtances; but the exceſs of acid which theſe ſolutions neceſſarily contain, and their powerful action on the cloth, renders their application leſs general than the preceding. The ſolution of tin moſt proper for yellows is the muriatic, and is formed by digeſting, in a low heat for ſeveral days, the common muriatic acid, or ſpirits of ſalt, on fine grain tin. This ſolution forms, with bark, a pale and lively yellow, and with berries a yellow bordering more on orange. Theſe ſpirit yellows, however, as they are improperly called, are ſeldom uſed except upon dyed grounds, and of this preparation for ſuch purpoſes we ſhall treat at large under the head of *Diſcharged* Work.

Blue.

The only blue belonging to this claſs is that produced by combining the colouring matter of logwood with the oxyd of copper. It is but ſeldom uſed ſince the mode of dipping China blue has become generally known; and indeed its want of durability renders it of little value. It may be produced by combining almoſt any of the ſolutions of copper with a decoction of logwood.

1. Boil two pounds of logwood in a gallon of water, and to the decoction, thickened with gum, add eight ounces of ſulphate of copper.

2. To a decoction of logwood as above, add two ounces of ſulphate of copper, and two ounces of verdigriſe.

Their colours may either be rinſed off or limed, as beſt ſuits the ſtyle of work. The theory of theſe combinations is the ſame as the preceding.

Green.

The chemical or falſe green is a compound colour, and conſiſts of a mixed decoction of logwood and berries, or bark, and a ſolution of copper. Though fugitive, its uſe is in ſome degree authorized by the impoſſibility of obtaining a green of greater durability that can be applied in figures with the block. The faſt green of the calico printers is the product of two operations, and is of courſe limited in its application, and tedious in its uſe. The production of a faſt green at one operation, or rather by one application to the cloth, either with the pencil, block, or preſs, is one of the great *deſiderata* of calico printing.

1. One pound of logwood and two pound of berries boiled together during two hours, and ſtrained whilſt hot

upon two ounces of ſulphate of copper, and two ounces of verdigriſe, and thickened with gum, form a good and lively green, the hue of which may be varied at pleaſure by the increaſe or diminution of the proportion of logwood. To this ſome calico printers add two ounces of common ſalt, and two ounces of ſal enixon or acidulous ſulphate of potaſh.

2. To one meaſure of blue of the firſt example in the preceding article, add two, three, four, &c. meaſures of a decoction of bark, made by boiling ſix pounds as before directed for the yellow, and to which, when reduced to one gallon, two ounces of ſulphate of copper, and two ounces of verdigriſe have been added. The tone of the green depending on the relative proportions of blue and yellow, it is, in general, beſt to keep the two decoctions ſeparate, to be mixed, when wanted, in ſuch proportions as may beſt ſuit the purpoſe required. The theory of theſe mixtures is the ſame as of the blue and yellow already deſcribed. To the eye of the mere ſpeculative chemiſt, the addition of common ſalt and acidulous ſulphate of potaſh in the firſt example, may appear unneceſſary and unmeaning. They indeed affect little, either the hue or fixity of the colour, but experience has proved that this addition facilitates its working with the block, more eſpecially when thickened with gum dragon. The cauſe of this, in the particular inſtance before us, is perhaps not very clear. The ſulphuric ſalts in general, ſuch as the ſulphates of alumine, iron, and copper, are all unfavourable to working, as their ſolutions, eſpecially when concentrated, neither thicken well with flour nor gum. A ſaturated ſolution of copperas cannot be thickened with flour, nor can a ſtrong ſolution of the aceto-ſulphate of alumine, in which the alum is in great exceſs; even with gum it unites with difficulty. But if to a ſolution of copperas, which refuſes to form a paſte with flour, a ſmall portion of nitrate of iron be added, the whole forms a good and ſubſtantial paſte that works admirably with the block; and half a pound of common ſalt added to the aceto-ſulphate of alumine has a ſimilar effect. In the inſtance more particularly before us, the addition of common ſalt forms a muriate of copper by the decompoſition of the ſulphate; but this laſt is in too ſmall a quantity to affect the working of the colour very ſenſibly. The cauſe of theſe effects is to be ſought for in the very complicated play of affinities, which exiſt in ſuch compounds, and which future inveſtigation and diſcovery may perhaps unfold. The ſpeculative philoſopher, who is ignorant of the minute details of an art, that involves in it conſideration and difficulties, unſuſpected in the laboratory, will hence learn to ſuſpend his judgment in deciding on the merits of a formula, till experience ſhall have proved the inutility of thoſe ingredients which theory would reject as abſurd.

But to return to our ſubject, there is a wide field open for experiment and diſcovery in the production of greens, into which logwood does not enter. A calico printer near London, celebrated for his ingenuity and invention in colours of this claſs, has long employed a green which, from its beauty and durability, when compared with the foregoing colours, indicate the preſence of indigo as a conſtituent part. Pruſſian blue in a minutely divided ſtate, and mixed with bark or berry-yellow has been employed; but the blue in this caſe has ſo little adherence to the cloth, that mere mechanical force, the operation of rinſing and waſhing is ſufficient to diſengage it. With one or other of theſe ſubſtances, however, it is likely that greens much ſuperior in beauty, and probably alſo in durability to thoſe generally in uſe, might, by a ſeries of patient and well conducted experiments, be readily obtained.

Pink.

The pale, and more delicate ſhades of red, belonging to this claſs, are chiefly ſought after in calico printing. They are employed in giving relief or effect to other admixtures of a more ſober caſt, and all the ſkill of the colour-maker is exerted in giving them brilliancy and richneſs of tint. They are chiefly produced from decoctions of Brazil, nicaragua, or peachwood, and cochineal, raiſed and fixed on the cloth with ſolutions of tin, rarely with the aluminous mordants, though delicate and lively colours may be produced this way.

The nitro-muriate of tin is chiefly employed, though the relative proportion of the two acids, and their degree of ſaturation with tin, varies almoſt with every calico printer. The ſolution itſelf, made according to eſtabliſhed rule, and with the ſame properties, varies ſo conſiderably at different times, as wholly to alter the nature of its compounds, without any apparent cauſe of failure. The ſource of this diſcordance is to be ſought for in the conſtitution of the ſolution itſelf, which, from cauſes that we ſhall endeavour to explain, is ſubject to conſiderable variation.

Firſt, from the ſtrength or concentration of the acids employed, which are ſeldom uniform or conſtant; muriatic acid from the ſame manufacturer varying often in ſpecific gravity from 1.12 to to 1.18, and nitrous acid not leſs than from 1.15 to 1.23, without reference to the common diſtinction of ſingle and double aquafortis.

When the ſpecific gravity of the acids is neglected, as is but too generally the caſe, theſe differences occaſion ſerious inconveniences in the uſe of ſolutions, whoſe properties often depend on the accuracy of their proportions, and on determinate degrees of ſaturation.

Secondly, from the impurity of the acids. The muriatic acid of commerce always contains iron and ſulphuric acid; if the former exiſt in any notable proportion, it is unfit for the ſolution of tin; the preſence of the latter is of leſs importance, though, on the whole, unfavourable to delicate colours. The nitrous acid varies conſiderably in its purity, being ſubject to greater or leſs admixture with the muriatic; the nitre it is made from being ſeldom free from marine ſalt. The aquafortis of commerce is, in fact, an aqua regia. This variation of the proportion of muriatic acid in the nitrous, is of the utmoſt importance, ſince the properties of the ſolution eminently depend upon this. With muriatic acid only, tin forms a colourleſs and permanent ſolution, one of whoſe diſtinguiſhing properties is, its ſtrong affinity or attraction for oxygen. With decoction of cochineal, it forms a deep and dull purple-coloured precipitate, which, however, gradually abſorbs oxygen, and becomes crimſon, eſpecially when expoſed on the filtre. With decoctions of Brazil and peachwood, it affords crimſon precipitates, varying in intenſity with their ſaturation with tin. It decompoſes all the combinations of iron with colouring matter, deoxygenating the iron which it carries off, leaving the tin in combination with the colouring matter. Thus a madder black becomes a red on the application of muriate of tin. On this property is founded the art of printing on dyed grounds, of which we ſhall treat hereafter. With nitrous acid, unleſs very dilate, tin contracts a very feeble union, and is generally precipitated as ſoon as diſſolved, in a ſtate fully ſaturated with oxygen. The addition of a ſmall quantity of muriatic acid renders this ſolution more permanent, provided it be not fully ſaturated with tin, and the addition of larger portions approximates the ſolution ſtill more to the nature of the former, and renders it capable of ſupporting a greater degree of ſaturation. The properties of the ſolution depend greatly on the proportion of muriatic acid, and conſequently of muriate of tin contained in it. When ſmall, the precipitate with cochineal is bright carmine ſcarlet. It does not decompoſe the combinations of iron with colouring matter, unleſs the ſolution be far from ſaturation, and this effect is then due to the diſengaged acid only.

The purity of the tin is another requiſite which ſhould be carefully attended to. The fine tin of Cornwall, commonly called grain tin, ſhould be employed. If alloyed with lead, it is wholly unfit for theſe purpoſes.

In lieu of muriatic acid, ſal ammoniac and common ſalt are oftentimes employed to form an aqua regia with nitrous acid. The ſolution differs little from that formed by a mixture of the two acids, the allowance being made by the portion neutralized by the alkali of the neutral ſalt.

From this ſhort outline of the hiſtory of the ſubſtances employed in the formation of the ſolutions of tin, and of the properties of the ſolutions themſelves, may be deduced ſuch general ideas as will elucidate and explain many anomalous effects in their combinations with different colouring matters, and ſeem to direct future experiment in the diſcovery of thoſe minute, but often important, conditions neceſſary to the formation of particular ſhades of colour.

The following examples of ſpirit reds, as they are improperly called by calico printers, will illuſtrate ſome of the preceding obſervations, and may be conſidered as ſpecimens of the moſt beautiful and brilliant colours it is poſſible to form upon cotton.

1. Prepare an equa regia by diſſolving two oz. of ſal ammoniac in one pound of nitrous acid of ſpecific gravity 1.25. To this add two ounces of fine grain tin; decant it carefully off the ſediment, and dilute it with $\frac{1}{4}$ its weight of pure or diſtilled water.

To one gallon of water add one pound of cochineal, ground as fine as flour; boil half an hour; then add two ounces of finely pulverized gum dragon, and two ounces of cream of tartar, and ſtir till the whole is diſſolved. When the liquor is cool, add one meaſure of the preceding ſolution of tin, to two of the cochineal liquor, and incorporate well by ſtirring. Apply this with the pencil or block, ſuffer it to remain in the cloth ſix or eight hours, then rinſe off in ſpring water. This colour will be a bright and beautiful ſcarlet.

2. Boil 12 pounds of Brazil chips during an hour in as much water as will cover them. Draw off the decoction, and pour on freſh water, and boil as before. Add the two liquors together, and evaporate ſlowly down to one gallon. To the decoction whilſt warm add four ounces of ſal ammoniac, and as much gum dragon or ſenegal as will thicken it for the work required. When cool, add one of the ſolution of tin before deſcribed, to four, ſix, or eight of the Brazil liquor, according to the colour wanted. Suffer it to remain from 18 to 24 hours on the cloth, then rinſe off in ſpring water as before. The colour will be a pale and delicate pink. If it is required deeper, the decoction muſt be made ſtronger, and uſed in the proportion of three or four to one of the ſolution of tin. Nicaragua or peachwood, though not ſo rich in colouring matter as Brazil, yields a colour, however, which is, if poſſible, more delicate and beautiful. The fine pinks produced by certain houſes, which have for years been the envy and admiration of the trade, are afforded by this fine dye-wood.

Theſe colours require no liming, ſimple affuſion with water being ſufficient to precipitate the colouring matter in combination with the tin. The theory of theſe mixtures is the ſame as the preceding. They require, however, a greater exceſs of acid to hold the colouring matter in ſolution. A decoction of cochineal poured into a ſaturated ſolution of tin, occaſions an inſtant precipitate which is not rediſſolved, and the greater part of which, if applied to cloth, would come off in the operation of rinſing. It is ſometimes neceſſary to add a ſmall quantity of muriatic acid to prevent this precipitation, or to correct it when it happens, and ſal ammoniac is ſuppoſed to have the ſame effect, probably by engaging the water of the ſolution.

With the aluminous ſalts, the decoction of cochineal and Brazil forms colours leſs brilliant than thoſe we have juſt deſcribed, but which are applicable in caſes where the exceſs of acid in the ſolutions of tin is attended with inconvenience.

1. To one gallon of water, add eight ounces of finely ground cochineal, and two ounces of bruiſed galls; boil half an hour, ſtrain the liquor whilſt hot through a fine cloth, upon four ounces of cream of tartar and four ounces of gum, and thicken with gum dragon. This colour requires liming.

2. Upon 6lbs. of Brazil and 2 oz. of galls, pour one gallon of water, let them ſoak ſome time, then boil two hours, replacing the evaporated liquor with freſh water. Strain through a fine cloth upon 4lb. of gum ſenegal, and add one pint of the acetite of alumine, deſcribed in a former part of this article.

The addition of galls in the two preceding formulæ is ſuppoſed to import ſolidity to the colours in ſome way analogous to the operation of galling in ſilk and cotton dyeing, of which we ſhall have occaſion to ſpeak hereafter. Their conſtitution is otherwiſe the ſame as the berry and bark yellows, and moſt others of this claſs of colours.

Purple.

1. If the ſolution of tin directed for the pink in the laſt article be mixed with ſix times its bulk of a decoction of logwood poured whilſt hot upon four ounces of ſal ammoniac, and $2\frac{1}{2}$ lbs. gum ſenegal, a bright and lively purple will be obtained, the hue of which varies with the ſtrength of the decoction and the proportion of ſolution of tin employed.

2. If inſtead of the ſolution of tin, the acetite of alumine before alluded to, be uſed in various proportions of one ſixth, eighth, &c. purples differing in ſhade and intenſity will be formed, applicable in ſome caſes, but poſſeſſing leſs ſolidity than moſt of the colours already deſcribed.

The conſtitution of theſe compounds is the ſame as the preceding.

Olive.

Olives are variouſly compounded, according to the colour required.

1. By mixing chemical black in various proportions with berry or bark yellow. The depth and fulneſs of the olive depends on the quantity of black.

2. By a decoction of logwood added in greater or leſs quantity to the bark or berry yellow.

3. By the addition of copperas or nitrate of iron to decoctions of yellow or aſtringent colouring matters, ſuch as bark, ſumac berries, weld, &c. each of theſe produces a different hue, varying from the green olive to a drab or cloth colour. By mixing theſe decoctions in different proportions, and by varying their ſtrength, and the quantities of copperas

or nitrate of iron added to each, a multiplicity of ſhades may be produced, of which it is impoſſible to convey any preciſe or definite ideas.

Theſe colours may be indifferently thickened with flour or gum, as beſt ſuits the work required, but when nitrate of iron is added to ſolutions containing gum, the inſtant coagulation that takes place muſt be counteracted by the addition of a portion of free nitrous acid. This effect ariſes from the ſtrong action exerted by metallic oxyds, at the maximum of oxydation, on mucilage or gum. When the decoction is very concentrated, and contains ſufficient colouring matter to engage the whole of the iron, this effect takes place in a leſs degree, but with ſolutions adapted to the production of the foregoing colours, a coagulation invariably takes place, unleſs counteracted by the preſence of a portion of free acid. Of this action of metallic oxyds on the ſolution of gum we ſhall further treat under the article Gum.

Claſs III.

In this claſs, the colouring matter is ſimply held in ſolutions, by an acid or alkali, and in that ſtate applied to the cloth without the intervention of any mordant.

The moſt important of theſe colours, is the alkaline ſolution of indigo which forms the topical or.

Pencil Blue.

1. Prepared ſolution of pot-aſh, by boiling together 7½lbs. of quick lime, and 15lbs. of pot-aſh, in 10 gallons of water. Decant off the clear liquor, and ſeparate the remainder from the lime by means of the filter. To one gallon of this ſolution, add 1lb. of red arſenic, or orpiment, and 1lb. of fine indigo, both previouſly ground together in a mill with ſufficient water to form a thick paſte. Bring them up gradually to a boil, ſtirring carefully all the time, and then withdraw the fire. Thicken the ſolution with the beſt gum ſenegal, and for the pale ſhades of blue, dilute with one, two, &c. meaſures of gum-water.

The quantities and relative proportions of pot-aſh, orpiment, and indigo in a gallon of pencil blue vary conſiderably with different calico printers, and within certain limits, it appears, that the accuracy of theſe proportions is not of great importance. Hauſman, an intelligent French printer, employs 15lbs. of pot-aſh, 6lbs. of orpiment, and 8lbs. of indigo, to 12 gallons of water; and Oberkampf, proprietor of the celebrated manufactory of Tony, a ſtill greater proportion of indigo. Some printers add brown ſugar, and Bancroft has propoſed to ſubſtitute this for the orpiment, but without ſucceſs.

The ſolution, when recently made, is a yellowiſh green, but by expoſure to air, becomes gradually deeper, and at laſt blue. In this ſtate, it is wholly unfit for uſe, it contracts no union with the cloth, and is detached from it in the firſt operation of rinſing.

Of the peculiar nature and properties of indigo, we ſhall have occaſion to treat hereafter, under its proper head, at preſent it will ſuffice to obſerve, that it owes its colour and inſolubility in alkalies, to a portion of oxygen intimately combined with it. To render it ſoluble, therefore, it muſt be deprived of this oxygen, by the action of a ſubſtance having a more powerful affinity for it, and the ſulphuret of arſenic, or orpiment, is uſed for this purpoſe. Sulphate of iron, has a ſtrong affinity for oxygen, and is employed in de-oxygenating indigo for certain purpoſes; but the oxyd of iron not being ſoluble in alkalies, the ſolutions of indigo, formed by it, become quickly regenerated by the abſorption of oxygen, and cannot even be transferred from one veſſel to another. The ſulphuret of arſenic, on the contrary being very ſoluble in alkalies, preſents the double advantage of de-oxygenating the indigo, and of retaining it awhile in that ſtate, till on its application to cloth, it becomes expoſed ſo completely to the action of atmoſpheric air, as to regain its oxygen, colour, and inſolubility; and becomes fixed in its original or blue ſtate.

The copper coloured pellicles, which forms on the ſurface of pencil blue, and is renewed immediately on its removal, ariſes from the abſorption of oxygen, which, in ſpite of the action of the orpiment, is continually taking place. Hence ariſes that diſpoſition to unevenneſs, which is the great diſadvantage of this blue; the unavoidable expoſure to air of ſmall portions of the colour during its application with the pencil, reviving greater or leſs portions of indigo, and conſiderably reducing its ſtrength.

Moſt calico printers boil up the quicklime with the other ingredients, thinking its preſence not leſs neceſſary than the pot-aſh and orpiment; by this means a conſiderable portion of the ſolution of indigo is taken up by the ſediment, which careful waſhing does not wholly ſeparate. As the action of the lime is confined merely to the alkali, which it renders cauſtic, and capable of acting with greater force on the other ingredients; it is certainly much more economical to render the pot-aſh cauſtic before its addition to the indigo. A conſiderable waſte of colour is by this means prevented, and the ſolution may be thickened the moment the ebullition has ceaſed without waiting for the depoſition, which in the old mode takes place.

Orange.

The oxyd of iron, when diſſolved in acetous acid, forms one of the moſt uſeful and important mordants, as we have already ſhewn in the former part of this article. It is alſo capable of imparting a very pleaſing and permanent colour itſelf to cotton, when applied in ſolutions of tolerable ſtrength and purity, and forms the orange, buff, and gold colour of the calico printers.

1. The ſolutions of iron in vinegar, ſtrengthened by the addition of copperas may be uſed, but the pureſt and brighteſt gold colours are obtained from copperas and ſugar of lead, in the proportion of 5lbs. of the former, and 1lb. of the latter, to a gallon of water. When thickened with gum, and employed undiluted, it affords, when limed, a full ſtrong gold colour, and with two, four, ſix, &c. times its bulk of water, various ſhades of orange and buff, which reſiſt the action of air, alkalis, and ſoap; and are rather exalted than impaired by frequent waſhing. The addition of ſugar of lead, is to increaſe the ſtrength of the ſolution. A gallon of water diſſolves about 4lbs. of copperas. The addition of a pound of ſugar of lead, enables it to take up another pound nearly, and the ſtrength of the ſolution may be ſtill further increaſed by equal additions of the two ſalts. The operation of liming is a ſimple precipitation of the oxyd of iron on the cloth, and in caſes when this cannot be performed, the proportion of ſugar of lead muſt be increaſed to nearly that of the copperas. It is only the paler ſhades of orange, however, which are to be obtained this way. The deep gold colour before named, is not to be procured without the aid of a precipitant. Spaniſh brown is ſometimes added to a ſolution of iron, and employed in ſuch a caſe, but it contracts no union with the cloth, and is readily removed by ſimple waſhing and beating. When the orange, or gold colour, is thickened with flour, a ſmall portion of nitrate of iron muſt be added to the paſte, for reaſons we have aſſigned on a former occaſion.

2. A beautiful, but fugitive orange, is obtained by boil-

ing half a pound of annotta with 1lb. of cauſtic pot-aſh in a gallon of water, and thickening the liquor with gum. This colour acts powerfully on the ſieves and blocks, which it very ſoon deſtroys, and on this account, and alſo from its want of permanence is ſeldom uſed. It may either be ſimply rinſed off, or firſt paſſed through water rendered ſlightly acidulous with ſulphuric acid, or what is ſtill better through alum-water. This operation is the very reverſe of liming, for here the colouring matter to be precipitated, being held in ſolution by an alkali, an acid muſt be employed for that purpoſe. The colour by this means is conſiderably heightened, and when applied with the pencil, is uſeful in ſome caſes where the other colours will ſupport the action of alum-water without injury.

Borax, and even ſpirits of wine, are ſometimes added to the alkaline ſolution of annotta, and are ſuppoſed to contribute to its ſtrength and fixity, though on what principle it is not eaſy to diſcover.

Green.

The oxyd of copper, diſſolved in volatile alkali, affords a pale and delicate green, which is ſometimes employed intermixed with other colours. Turnings of copper, or verdigriſe, which is more generally uſed, may be digeſted in a low heat with ſpirits of ſal-ammoniac. Care muſt be taken that the heat be very moderate, and the veſſel in which the ſolution is made, well ſtopped, the ammoniac will otherwiſe be driven off, and loſt. When the alkali has taken up as much copper as it can diſſolve, the ſolution muſt be thickened with gum, and applied with the block or pencil. In a few days the ammoniac evaporates and leaves the oxyd of copper on the cloth, which muſt be rinſed to free it from the gum and ſuperfluous colour.

The blues produced by alternate immerſion in copperas and lime, and alſo in the ſolution of indigo, by the ſame ſubſtances, properly come under this claſs of colour, as they are ſolutions of colouring matter in lime and alkalis. As the proceſſes by which they are applied, differ however very materially from all thoſe that we have been treating of, they claim a ſeparate and diſtinct notice. For the details of theſe operations, and the mode of preparing the paſtes for bark and pale blue dipping, and the colours for China blue, we muſt therefore refer our readers to the article *Dipping* Blue.

Colours, in *Dyeing*.—There are five ſimple, primary, or mother colours, uſed by the dyers: from the mixture whereof all the other colours are formed; theſe are blue, red, yellow, black, and brown colour; each of which ſee under their proper head, Blue, Red, &c.

Of theſe colours, mixed and combined, other colours are formed, which are infinitely various, according to the proportion of the different ingredients that are employed, or the proceſſes by which they are blended. Thus a mixture of *blue* and *yellow* forms *green*, which is diſtinguiſhed by dyers into a variety of ſhades, according to the depth of the ſhade, or the prevalence of either of the component parts. Hence we have *ſea-green*, *graſs-green*, *pea green*, &c. &c. *Blue* and *red* form different ſhades of *violet*, *purple*, and *lilac*. A mixture of *yellow* and *red* produces *orange*. Mixtures of *black* with other colours conſtitute *greys*, *drabs*, and *browns*. For a more particular account of theſe and other colours; and the method of procuring and applying them; ſee the article Dyeing. See alſo the preceding article.

The greateſt perfection in the art of colours would be to find the means of preparing the fineſt colours without the uſe either of acid or alkaline ſalts, which uſually ſubject the colours to change, or elſe are apt to prey upon the cloth, canvas, &c. as we ſee in verdigriſe, the blue and green cryſtals of copper, &c. It appears highly probable, that the Indians, for making the fine bright and durable colours, wherewith their chintzes and callicos are ſtained, make uſe of metalline ſolutions; for ſome ſtained callicos, brought from thence, having been kept 40 or 50 years, the bright colours have been obſerved to eat out the cloth, exactly in the ſame manner as acid ſpirits, which diſſolve metals, are found to do.

Since theſe, then, are the inconveniences attending ſuch colours, we ought to ſearch for menſtruums with which to extract colours, which are neither acid nor alkaline; and for ſuch metalline oxyds, precipitates, or powders, as will not loſe their colours, by being well waſhed to get out their ſalts; to prepare certain metalline matters, by mere calcination, or the bare aſſiſtance of fire; and laſtly, to look out for native colours, wherein no ſaline matter abounds.

Mr. Geoffroy has given a very curious proceſs for making two clear, ſpirituous, inflammable liquors, which differ very little in taſte and ſmell, and being mixt together give a fine carnation colour, without any ſenſible fermentation.

To make the firſt of theſe liquors, put a ſmall handful of dried red roſes into a glaſs bottle; pour on them rectified ſpirit of wine, till it covers them an inch; let this ſtand in a cold infuſion four or five hours; then pour off the liquor, which will be clear and colourleſs, as when put on. The ſecond liquor is made by dropping into rectified ſpirit of wine, ſo much oil of ſulphur, by the bell, or ſpirit of vitriol, as will be borne in it without giving it any very ſenſible acidity when taſted. When theſe liquors are thus prepared, let a ſmall quantity of the latter be dropped into ſome of the former, and the whole will become of a fine carnation colour, though there is no fermentation, nor any other change perceived in it, but barely that of colour. If inſtead of this laſt liquor, there be added to the firſt a few drops of the ſpirit of ſal ammoniac, the whole will become green.

Make a ſlight infuſion of galls in water, ſo as not to colour the water; make alſo a weak ſolution of green vitriol in water, ſo that it may appear colourleſs; mix theſe two colourleſs liquors together, and an inky blackneſs is immediately produced; add to this black liquor a little oil of vitriol, and the liquor becomes pellucid and colourleſs again; then add to this a little ſalt of tartar, and the whole is black again.

Put a little bruiſed camphor into rectified clear oil of vitriol; ſhake the mixture, and it will become black, and the camphor will be diſſolved; add to this a little water, and the liquor becomes clear, and the camphor is found ſeparated at top, in its own form, and native whiteneſs.

Infuſe lignum nephriticum in cold water, and pour off the clear liquor. This held up againſt the light, appears of a fine yellow, but viewed from the light, of a beautiful blue: a little ſpirit of nitre put to this liquor makes it loſe the power of reflecting the blue rays, and a little oil of tartar, afterwards added, recovers that power again.

Logwood, infuſed in water, gives a red colour. Put to this a little ſpirit of urine, and it becomes of a fine purple; and drop in afterwards a little ſpirit of ſalt, and it becomes of a pale red.

A beautiful blue tincture may be made from filings of copper, by digeſting them in ſpirit of urine, hartſhorn, or the like. The addition of oil of vitriol deſtroys the blue colour; and a little ſpirit of ſalt turns it green.

Pellucid oil of vitriol, mixed with pellucid oil of turpentine, produces a thick red balſam. And common oil, mixed with fair water, by means of a little wax, and continued rubbing, turns into a thick white balſam, called cold cream.

Oil of vitriol, diſtilled from quickſilver, leaves a white powder behind, which, if water be poured on it, becomes yellow.

Diſſolve quickſilver in ſpirit of nitre, and to part of it add ſpirit of urine, and a white powder is precipitated; to another part of the ſolution add oil of tartar, and a yellow powder falls to the bottom.

Dip a new pen in ſpirit of vitriol, and write with it on common blue paper, and the letters will appear red.

A pellucid ſolution of ſaccharum ſaturni being written with on paper, becomes inviſible when dried; but the bare fumes of an infuſion of quick lime, and orpiment, in water, will render the inviſible writing black and legible.

Volatile ſalt of ſal ammoniac, which is white, mixed with cryſtals of copper, which are green, produce a fine purple.

The original and ſimple, as well as the mixt, colours are producible by mixture. Thus, if the ſun's rays paſs through two pieces of glaſs, the one blue, and the other yellow, and be afterwards received upon a white paper, the colour there ſeen is green. The dyers make cloth blue with woad, and then turn it green by the yellow herb called luteola, or dyers' weed. To a yellow ſolution of gold in aqua regia add a blue one of copper in ſpirit of urine, and the mixture becomes green. The painters every day practiſe this art of producing new colours by mixture.

Metalline and mineral matters are reducible to a conſiderable degree of ſubtlety, or ſmallneſs of parts by fire, or dry calcination, ſo as to leave them durably poſſeſſed of their native or adventitious colours. Thus lapis lazuli, by being calcined, becomes the fine rich blue called ultramarine; light ochre, by the ſame treatment, becomes a light red, or fleſh colour, the moſt uſeful fleſh-colour in painting. Lead, by calcination, becomes durably red, and iron durably brown; but a proper method ſeems wanting for the dry calcinations of the nobler metals, gold and ſilver; though, for the uſes of gilding, theſe are eaſily prepared by dipping linen rags in their reſpective ſolutions, and then drying, and burning them to aſhes, whereby a dry and fine metalline powder is procured.

Colour, in *Heraldry*, the heraldic colours are nine, and were anciently expreſſed by the word *tincture*, *viz.* or, argent, azure, gules, ſable, vert, purpure, tenney, and ſanguine, and alſo by precious ſtones and planets; the armorial colours are blazoned in different terms, according to the rank and dignity of the perſon whoſe arms are deſcribed, as follows:

Colours.	For Commoners by Tinctures.	For Peers by Precious Stones.	For Emperors, Kings, and Princes, by Planets.
Yellow,	Or,	Topaz,	Sol.
White,	Argent,	Pearl,	Luna.
Blue,	Azure,	Sapphire,	Jupiter.
Red,	Gules,	Ruby,	Mars.
Black,	Sable,	Diamond,	Saturn.
Green,	Vert,	Emerald,	Venus.
Purple,	Purpure,	Amethyſt,	Mercury.
Orange,	Tenney,	Jacinth,	Dragon's head.
Dark red,	Sanguine,	Sardonix,	Dragon's tail.

For a fuller account of each, ſee under the reſpective heads.

Or, and argent are metals, and it is an invariable rule in heraldry not to put colour upon colour, or metal on metal; that is if the field be of a colour, the charge or bearing muſt be of a metal.

Colour, in *Law*, is a probable or plauſible plea; though in reality falſe at bottom; and only calculated to draw the trial of the cauſe from the jury to the judge: and, therefore colour ought to be matter of law, or doubtful to the jury.

In pleading it is a rule, that no man be allowed to plead, ſpecially, ſuch a plea as amounts only to the general iſſue; but in ſuch caſe he ſhall be driven to plead the general iſſue in terms, by which the whole queſtion is referred to a jury. But if a defendant in an aſſiſe or action of treſpaſs, be deſirous to refer the validity of his title to the court rather than to the jury, he may ſtate his title ſpecially, and at the ſame time *give colour* to the plaintiff, or ſuppoſe him to have an appearance or colour of title, bad indeed in point of law, but of which the jury are not competent judges. As if his own true title be that he claims by feoffment, with livery from *A.* by force of which he entered on the lands in queſtion, he cannot plead this by itſelf, as this plea amounts to no more than the general iſſue. But, he may allege this ſpecially, provided he goes farther and ſays, that the plaintiff claiming by *colour* of a prior deed of feoffment, without livery, entered, upon whom he entered; and may then refer himſelf to the judgment of the court, which of the two titles is the beſt in point of law. (Doctor and Student. 2. c. 53.) Every *colour* ought to have the following qualities. 1. It is to be doubtful to the *lay-gens*, as in caſe of a deed of feoffment pleaded, and it is a doubt whether the land paſſeth by the feoffment, without livery or not. 2. *Colour* ought to have continuance though it wants effect. 3. It ſhould be ſuch *colour*, that, if it were effectual, would maintain the nature of the action, as in aſſiſe, to find colour of freehold, &c. (10 Rep. 88, 90, and 91.) *Colour* muſt be ſuch a thing, which is a good colour of title, and yet it is not any title. (Cro. Jac. 122.) If a man juſtifies his entry for ſuch a cauſe as binds the plaintiff or his heirs for ever, he ſhall not give any *colour*; but if he pleads a deſcent in bar, he muſt give *colour*, becauſe this binds the poſſeſſion, and not the right; ſo that when the matter of the plea bars the plaintiff of his right, no *colour* muſt be given. When the defendant entitles himſelf by the plaintiff; where a perſon pleads to the writ or to the action of the trial; he who juſtifies for titles; or where the defendant juſtifies as ſervant; in all theſe caſes no *colour* ought to be given. (10 Rep. 91. Lutw. 1343) Where the defendant doth not make a ſpecial title to himſelf, or any other, he ought to give *colour* to the plaintiff. (Cro. Eliz. 76.) In treſpaſs for taking and carrying away twenty loads of wood, &c. the defendant ſays, that *A. B.* was poſſeſſed of them, *ut de bonis propriis*, and that the plaintiff claiming them by *colour* of a deed after made, took them, and the defendant retook them; and adjudged that the *colour* given to the plaintiff makes a good title to him, and confeſſeth the intereſt in him. (1 Lil. Abr. 275.)

Thus, e. gr. in an action of treſpaſs for taking away the plaintiffs beaſts, the defendant urges, that before the plaintiff had any intereſt in them, he himſelf was poſſeſſed of them, as his proper goods; and delivered them to *A. B.* to deliver to him again, when, &c. and *A. B.* gave them to the plaintiff: and the plaintiff, ſuppoſing the property to be in *A. B.* at the time of the gift, took them, and the defendant took them again from the plaintiff; whereupon the plaintiff brings his action.—This is a good *colour*, and even a good plea. Doct. and Stud.

Colour *of office*, is when ſome unjuſt action is done under countenance of office or authority. See BRIBERY and EXTORTION.

To Colour *ſtrangers goods*, is when a free man allows a foreigner to enter goods at the cuſtom-houſe in his name.

Colours, *camp*, are a ſort of ſmall colours planted on the right and left of the parade of a regiment when in the field. They are about 18 inches ſquare, and of the colour of the facing of the regiment, with the number of the regiment marked on them. The poles, to which they are fixed, ſhould be about 7 feet 6 inches long; except thoſe of the quarter and rear guards, which ought to be about 9 feet long.

Colours, *field*. See Field.

Colours, *guard*. See Guard.

Colours *uſed in the drawings of fortifications and military works*, are chiefly *Indian ink*, *carmine*, *verdigriſe*, *ſap green*, *gum bouch*, *Pruſſian blue*, *Indigo*, *ſmalt*, *ultramarine*, *umber*, *gum-water*, which articles ſee ſeparately, as well as the article Fortification.

Colours, *Colores*, in the *Ancient Muſic*, was uſed to ſignify the muſical ſpecies belonging to a genus.

In this ſenſe the *chromatic genus* was ſaid to have three *colours*; and the *diatonic* two. The *enharmonic*, having no ſubordinate ſpecies, had but one *colour*. Hence the ancients reckoned three *genera*, and ſix *colours*, in muſic; that is, ſo many different diviſions of the *diateſſaron*, or fourth.

Colours, *diatonic*, or *muſical ſcale of*.—In the courſe of ſir Iſaac Newton's experiments on the properties of light, (Optics, book i. part ii. prop. 3.), he diſcovered the remarkable fact, that the ſpectrum of the ſun's image, formed by refracted light, let into a darkened room, is longitudinally divided by the points ſeparating the different colours, *viz.* violet, indigo, blue, green, yellow, orange, and red, into ſpaces which are reſpectively equal to $\frac{1}{9}$, $\frac{1}{18}$, $\frac{1}{12}$, $\frac{1}{12}$, $\frac{1}{15}$, $\frac{3}{80}$, and $\frac{1}{16}$, parts of the double length of the ſpectrum, as, ſuppoſe the ſpectrum to be 360 parts in length, then $\frac{80}{720}$, $\frac{40}{720}$, $\frac{60}{720}$, $\frac{60}{720}$, $\frac{48}{720}$, $\frac{27}{720}$, and $\frac{45}{720}$, will repreſent the length of each colour reſpectively, and adding theſe ſucceſſively in the reverſe order, to $\frac{360}{720}$, we have $\frac{405}{720}$, $\frac{432}{720}$, $\frac{480}{720}$, $\frac{540}{720}$, $\frac{600}{720}$, $\frac{640}{720}$, and $\frac{720}{720}$, which, in their loweſt terms, are $\frac{1}{2}$, $\frac{9}{16}$, $\frac{3}{5}$, $\frac{2}{3}$, $\frac{3}{4}$, $\frac{5}{6}$, $\frac{8}{9}$, and 1, and appear to be the diatonic ratios anſwering to the *octave*, minor *ſeventh*, major *ſixth*, *fifth*, minor *fourth*, minor *third*, major *ſecond*, and *key*-note; or, to VIII, 7th, VI, V, 4th, 3d, II, and key, repreſented in the gamut by *c*, bB, A, G, F, bE, D and C.

From the experiments of Henry Brougham, jun. eſq. Philoſophical Tranſactions, 1796, it appears, that not only by *refraction*, but by *inflection*, *deflection*, and *reflection*, the rays of light may be ſeparated on a chart or ſcreen: and he mentions numerous experiments, wherein the limits of the ſeveral colours on the ſpectrum were carefully marked with the point of a needle, after which the papers thus marked were put away, and a freſh paper ſubſtituted for other experiments: the meaſurement or compariſon of the lengths of the intervals occupied by each colour on the different papers, being purpoſely deferred, until the whole courſe of experiments was completed, in order to prevent any preconceived opinions from operating, in making the experiments: the reſults are repreſented as agreeing, in the ſpaces $\frac{1}{9}$, $\frac{1}{18}$, $\frac{1}{12}$, $\frac{1}{12}$, $\frac{1}{15}$, $\frac{3}{80}$, and $\frac{1}{16}$, occupied by the violet, indigo, blue, green, yellow, orange, and red colours, being the very ſame, as to arrangement, as thoſe by refraction above-mentioned.

It is obſervable, that the notes compoſing the octave thus produced, do not anſwer to the major-key of bB as it might ſeem to do, although ſome writers on muſical intervals have aſſerted, that nature produces only the major-key or diviſion of the octave, and that the minor *third* bE or $\frac{5}{6}$ is nowhere to be found in nature. If we were to conſider the *colorific ratios* $\frac{1}{2}$, $\frac{9}{16}$, $\frac{3}{5}$, $\frac{2}{3}$, $\frac{3}{4}$, $\frac{5}{6}$, $\frac{8}{9}$, and 1, found above as a minor octave, and to belong to the notes in the gamut *a*, G, F, E, D, C, B and A; and find the ratios anſwering to the octaves of C and B, *viz.* $\frac{5}{12}$, and $\frac{4}{9}$, or *c* and *b*; then, if from each of the above ratios we deduct the ratio $\frac{5}{6}$ (or multiply by $\frac{6}{5}$), we obtain $\frac{1}{2}$, $\frac{8}{15}$, $\frac{3}{5}$, $\frac{27}{40}$, $\frac{18}{25}$, $\frac{4}{5}$, $\frac{9}{10}$, and 1, for the notes in the octave *c*, *b*, *a*, G, F, E, D, and C, but which is not a major diatonic octave, becauſe thoſe principal notes, the V and 4th, or G and F, have not the ratio of $\frac{2}{3}$ and $\frac{3}{4}$ as they ought to have. Thus we ſee, that the eight notes anſwering to a colorific minor-key, do not hold the proper relation between themſelves, for forming a major-key, by merely aſſuming the third of the firſt key, as the new key-note: and ſtrictly ſpeaking, the ſame may be obſerved of any other tranſpoſition or modulation whatever, upon eight diatonic notes, or even upon any 12 notes compoſing an octave, taking all the conchords into account; although moſt of the keyed inſtruments, as organs, harpſichords, &c. in uſe, are made and played upon, and the notation or writing of muſic itſelf is founded upon this ſuppoſition, which is far from being correct.

Colour, in *Painting*, is applied both to the drugs, and to the teints produced by thoſe drugs, variouſly mixed and applied.

The principal colours uſed by painters, are red and white lead or ceruſs; yellow and red ochres; ſeveral kinds of earth, as umber, &c. beſides orpiment, black lead, cinnabar, gamboge, lake, bice, verditer, indigo, vermillion, verdegris, ivory black, biſtre, lamp black, ſmalt, ultramarine, and carmine; each of which, with the manner of preparing them, their uſes, &c. ſee under their reſpective heads.

Of theſe colours, ſome are uſed ground in oil, others only in freſco, others in water, and others only for miniature.

Colours, in an *Eccleſiaſtical Senſe*, are uſed both in the Latin and Greek churches, to diſtinguiſh ſeveral myſteries and feaſts celebrated therein.

In the Latin church are only regularly admitted five colours, viz. *white*, *red*, *green*, *violet*, and *black*: the *white* is for the myſteries of our Saviour, the feaſts of the Virgin, thoſe of the angels, ſaints, and confeſſors; the *red* for the myſteries and ſolemnities of the holy ſacrament, the feaſts of the apoſtles and martyrs; the *green* for the time between Pentecoſt and Advent, and from Epiphany to Septuageſima; *violet* in Advent, Chriſtmas, in vigils, rogations, and in votive maſſes in time of war: laſtly, *black* for the dead, and the ceremonies thereto belonging. Cloths of gold and ſilver, and embroidery, ſerve indifferently for all ſolemnities.

In the Greek church the uſe of *colours* is almoſt obliterated, as well as among us: *red*, among them, was the *colour* for Chriſtmas, and the dead, as black is ſtill for the laſt among us.

Colours, *Accidental*. See Accidental.

Colours, *Local*. See Local.

Colour, *rings of*. See Rings.

Colours, *water*. See Water.

COLOURABLE *title*. See Title.

COLOURING, in *Painting*, one of the great component and eſſential parts of painting, is the art of giving to every object in a picture its true and proper hue, as it appears under all the various circumſtances or combinations of light, middle-tint, and ſhadow; and of ſo blending and contraſting the colours, as to make each appear with the greateſt advantage and beauty, at the ſame time that it contributes to the richneſs, the brilliancy, and the harmony of the whole.

It likewiſe poſſeſſes powers which, when judiciouſly applied, render it highly conducive to the character and expreſſion of the ſubject repreſented.

A noble author, lord Lanſdown, "ſays, that verſification is in poetry, what colouring is in painting, beautiful ornament;" but the compariſon is ill-founded. Verſification is, indeed, an ornament, and ſo is colouring; but the former is merely an ornament, whereas the latter is neceſſary to the painter to enable him to make his imitation or repreſentation complete. "Should the moſt able maſter in deſign," ſays Mr. Webbe, "attempt by that alone a roſe or grape, we ſhould have but a faint and imperfect image; let him add to each its proper colours, we no longer doubt, we ſmell the roſe, we touch the grape."

Colouring, like chiaro-ſcuro, may therefore be divided into kinds; that which is *neceſſary* for rendering the imitation juſt and intelligible, and that which is *expedient* or *ornamental*, as contributing to make the work at once more impreſſive to the imagination, and more harmonious and delightful to the eye. Truth in the local tints is alone required in the firſt kind; the ſecond demands choice in their ſelection and diſtribution. For illuſtration, let us ſuppoſe the principal figure in a piece to be dreſt in ſky-blue, and another figure near it, of leſs conſequence in the ſtory, to be repreſented in ſcarlet, with an under veſtment of bright yellow, and let the light be made to ſtrike equally on both: in ſuch a caſe, it would be utterly impoſſible to give an effect agreeable or harmonious to the picture; although each of theſe objects ſhould be painted with the utmoſt exactneſs and truth; nay, the combination, though found in nature itſelf, would excite feelings of diſguſt and averſion; whereas, if the principal figure were dreſſed in ſcarlet and white draperies, and the figure next it in blue of not too light or bold a tint, the effect would be harmonious and pleaſing; and another point of great importance would be gained, as the eye would then be attracted by the principal figure, which could not have been the caſe in the former inſtance, where the gaudy combination of yellow and red muſt infallibly, as is natural with all warm colours, have firſt obtruded itſelf into notice. However, as the eye has the ſame intuitive abhorrence of unharmonious combinations of colours, that the ear has of diſcordant ſounds; it is, therefore, not ſurpriſing if we ſo ſeldom meet with enormities like the one above ſuppoſed, even in the works of thoſe artiſts who leaſt of all can lay claim to the ſcientific arrangement of colours: to produce effects not unharmonious, or diſagreeable, requires no great exertion of talent; but to perform all that can be done by the moſt ſkilful application of the various powers of the art is the lot of few.

In treating of chiaro-ſcuro, we have obſerved, that the part of it to which we have given the appellation of neceſſary or natural chiaro-ſcuro, was in a greater or leſs degree underſtood and practiſed from the earlieſt period of the reſtoration of painting: the ſame was the caſe with reſpect to what we have termed neceſſary colouring, or truth in the local tints.

The oldeſt painters of Florence, Giotto, Buffalmacco, and others; and ſtill more ſo, Simone Memmi, Ambrogio Lorenzetti, and the reſt of Saneſe ſchool of the ſame period, made frequently not unſucceſsful attempts at truth and even beauty in the tints of the fleſh and other parts of their pictures; and ſometimes produced a diſtribution of colours by no means ungracious in the whole; though the prodigal uſe of gold grounds and gold ornaments bid defiance to an effect truly harmonious. Mapolino da Panicale, Maſaccio, Dominico Ghirlandajo, and Pietro Perugino, went much further, and we rarely find a want of delicacy of colouring in the parts of their pictures, or of harmony in the general effect. But ſtill this was the reſult of a happy natural feeling for what was beautiful rather than of an approved and well-founded theory. It was not till the period when Leonardo da Vinci laid the foundation of an improved ſyſtem of chiaro-ſcuro, that the Bellini's of Venice began to diſcover the beautiful effects reſulting from a ſkilful combination or oppoſition of colours, at the ſame time that they attained a richneſs and truth in their local tints, far exceeding any thing hitherto practiſed. In both theſe qualities, however, they were ſoon far ſurpaſſed by their ſcholars, Georgione da Caſtel Franco, and Titiano Vecelli, who, ſuperadding to the moſt aſtoniſhing richneſs of colour, the powerful light and ſhade of da Vinci, produced works which, in their way, have baffled all future attempts at improvement. The tone of colour of their pictures is not that of nature in her every day garb; it is ideal, like the chiaro-ſcuro of Coreggio or Rubens; that which may be ſuppoſed, but which, perhaps, is ſeldom or ever found in nature: the depth and mellowneſs of their tints can ſcarcely be accounted for but by the ſuppoſition of a tranquil but vigorous light ſhining through the heated atmoſphere of a ſummers evening. The world was aſtoniſhed at this new ſtyle, and it is no wiſe ſurpriſing that Tintoretto, Paolo Veroneſe, and others who followed, being unable to do better, ſhould attempt ſomething different; the manly, the ſober ſenatorial dignity of Giorgione and Titian, was changed for magnificence, for ſhow, for glitter, and for ornament; invention, compoſition, deſign, and expreſſion, were all made ſubſervient to the inordinate deſire of effect of colour; the ſubject of the work could in many inſtances with difficulty be diſcovered, and their pictures may, in moſt caſes, be compared to bewitching nonſenſe uttered by the ſilver tongue of the woman we love; to the ſweet but fatal ſong of the Syren. There ſeems to be nothing in the colouring of Giorgione and Titian, incompatible with the greateſt purity of deſign, ſublimity of compoſition, or propriety of expreſſion; but the ſplendid extravagances, the caded ſtuffs, the gaudy trappings of the more modern Venetians, are wholly inconſiſtent with true grandeur, and too frequently ſeem to reſemble the wretched effort of poverty to perſonate opulence, or the deſpicable attempt of the lacquey or courtezan to outvie by their tinſel apparel the dignity of the nobleman, or the ſimple elegance of the woman of diſtinction.

Whilſt the two great founders of the Venetian ſchool enraptured the ſight by their tranſcendent and novel effects of colour, the Roman and Florentine painters, though principally applying their talents to the attainment of ſtill higher objects, were not wholly unmindful of this part of the art. Many of the freſcos of Raffaelle in the ſtanzas of the Vatican, and in particular the diſpute of the ſacrament, the St. Peter delivered out of priſon, the maſs of Bolſena, and the Heliodorus, are ſeverally coloured with the richneſs of Venetian tint, or with the pearly hue of Parma. However, from the latter works of this great maſter, it ſhould appear that he did not at all times conſider this branch of painting as worthy his attentive regard. Fra. Bartolommeo di San Marco, in his madonnas and apoſtolic figures, united grandeur of deſign and breadth of chiaro-ſcuro to a tone of colour at once dignified, tranquil, and harmonious; and Andrea del Sarto, except in ſome of his laſt works, where he in ſome degree adopted the gay and frivolous ſtyle then beginning to be in vogue, painted with a ſtrength and ſobriety of tint every way adapted to give increaſed intereſt and expreſſion to the devotional or ſacred ſubjects which he generally treated.

At this period, as if nature then made holiday, and was prodigally laviſh of her gifts, the great Coreggio appeared, and by his aſtoniſhing freſcos in the cupolas, and other works at Parma, ſeemed to caſt a new radiance on the world of art. In him the very ſoul of harmony reſided, and the magic of his pictures ſo irreſiſtibly intrances the ſight, as to render us almoſt incapable of diſcriminating, whether the aſtoniſhing effect is moſt the reſult of the breadth and ſoftneſs of his chiaro-ſcuro, or the beautiful combinations and tranſitions of his colours. However, delicacy of tint ſeems to have been the aim of Coreggio; richneſs and luxuriance of colour that of the Venetians. And it has been obſerved of the great artiſt of Parma, that the fleſh in his pictures ſeems generally of too firm a texture, and to want that humid appearance, the reſult of inſenſible tranſpiration, which forms one of the particular characteriſtics of human bodies, and which Titian and Giorgione ſucceeded ſo admirably in repreſenting.

Theſe are the great maſters of colouring amongſt the Italians. After this period a corrupt and frivolous ſtyle for ſome time predominated, and more particularly in the Roman and Florentine ſchools of painting. With them it was not uncommon to ſee yellow draperies ſhaded with purple, red ones with blue, or green with ſome other tint; as if it had been the intention to repreſent changeable ſtuffs; and the eye ſeemed gradually to have become accuſtomed to the moſt unharmonious, the moſt gaudy and abſurd combinations. Baroccio indeed made an effort to ſtem the torrent of this daſtard taſte. After having aſſiduouſly ſtudied the works of Coreggio, he attempted to adopt his principle, and ſo far ſucceeded, that he deſervedly had, and ſtill has his admirers. But in the works of Baroccio, the red, the blue, and the yellow are too oſtentatiouſly diſplayed, and want blending; which ſeems to juſtify the ſame critique on them that was made upon the works of Parrhaſius, that his figures looked as if they had fed on roſes.

The Venetian painters it is true, never entirely loſt ſight of the genuine principles of colouring; but even in this reſpect they fell far ſhort of the great founders of their ſchool above-mentioned, and the general frivolity of their taſte, too frequently occaſions even their merits to be paſſed by unregarded.

Coreggio had few followers; his divine ſpirit found not, like that of Donatello, a kindred place of abode amongſt his ſucceſſors; nevertheleſs, the Lombards preſerved a certain richneſs and harmony of tint, which ſtill, in this particular, entitled them to a higher rank than their contemporaries of lower Italy. The Carracci, towards the latter part of the 16th century, reſcued the art from the degeneracy into which it had fallen; and by uniting, as far as they were able, the different beauties of the Roman, Florentine, Lombard, and Venetian ſchools, produced a new ſtyle, and gave their name to an academy eminent for the various talents which it called forth. Their colouring, however, is not ſo rich as the Venetian, nor ſo harmonious as that of Coreggio; but it is exempt from glaring defect, ſimple and tranquil, and well ſuited to the ſobriety and dignity of hiſtory painting.

Of Caravaggio, their rival at Rome, it was hyperbolically ſaid, that he dipt his pencil in fleſh itſelf: but we have to regret that the black and opaque ſhadows which pervade his pictures, probably occaſioned in ſome degree by the periſhable nature of ſome colours which he uſed, deſtroy much of that truth of effect, which, from the praiſes beſtowed on him in his life-time, we have grounds for ſuppoſing they originally poſſeſſed.

The pencil of Guercino is broad, and his tints freſh and vigorous, but his effect is generally more the reſult of chiaro-ſcuro than of any remarkably ſkilful arrangement of his colours.

The pictures of Guido, in his firſt manner, poſſeſs conſiderable force of tint; but he afterwards abandoned this ſtyle for a mode of colouring weak and inſipid: nevertheleſs, his grace, his knowledge of expreſſion, and his unparalleled freedom of pencilling, gained him innumerable followers; till at length, that which ought to have been conſidered one of his greateſt faults, was numbered amongſt his beauties. It is true, that ſhortly after this period, landſcape was carried to the higheſt pitch of perfection by the Pouſſins, Salvator Roſa, and Claude Lorraine; the former giving to their pictures a ſtyle of colouring at once ſolemn and impreſſive, the latter a truth of aerial tint, never before or ſince attained. Nevertheleſs, a ſlight and flimſy manner of colouring became one of the characteriſtics of the Italian ſchools, and the deſerted daughter of Iris ſought an aſylum in the leſs congenial climes of Flanders and Holland.

Amongſt the Flemiſh painters, Rubens undoubtedly holds the firſt place; and his works, as ſir Joſhua Reynolds obſerves, "have that peculiar property always attendant on genius, to attract attention, and enforce admiration, in ſpite of all their faults." This, however, is not the place for a *general* inquiry into his merits. With reſpect to his colouring, we have to obſerve, that it evinces that exuberance and boldneſs of genius, which in every other part of the art peculiarly characteriſes him. It poſſeſſes neither the ſober richneſs of Titian, nor the delicate harmony of Coreggio, but ſeems frequently, by the gorgeous aſſemblage of tints, to vie with the gaiety of the chaplet or noſegay. It is perhaps, however, a matter worthy of inveſtigation, whether the great variety of colours, introduced by Rubens in the draperies and other parts of his pictures, has not, by the too great equality of their diſtribution, upon ſome occaſions proved detrimental, rather than advantageous, to the richneſs and ſplendour of effect, which at all times ſeems to have been his principal object; and whether that object would not have been more effectually attained, had he followed the practice of the early Venetians, in giving to two or three colours a more decided pre-eminence.

The ſtyle of Vandyke is more pure and chaſte. The modeſt tenderneſs of his tints gently but irreſiſtibly perſuade; and his numerous portraits, by their delicacy and truth of expreſſion, ſtill captivate and intereſt the beholder, even where the perſonages they repreſent have been long buried in oblivion.

Rembrandt is, as Mr. Fuſeli obſerves, a genius of the firſt claſs in every thing which relates not to form; but though as a colouriſt he certainly holds a pre-eminent rank, the effect of his pictures is, perhaps, as we have ſaid of Guercino, more the conſequence of his aſtoniſhing chiaro-ſcuro, than of the freſhneſs and vigour of his tints. His works preſent not the gorgeous combinations of colour found in thoſe of Rubens, or that humid mellowneſs of tint in the fleſh, ſo much admired in the pictures of Titian and Giorgione; nevertheleſs, they evince a moſt powerful conception of harmony, a beautiful gradation of tint, and great ſolemnity of tone. His lights have a brilliancy peculiarly his own; ſcarcely more owing to the powerful oppoſition of his chiaro-ſcuro, than to the extraordinary method which he uſed of painting the luminous parts of his pictures with a very great body of colour in almoſt a dry ſtate; whilſt his broad maſſes of ſhadow poſſeſs a magic tranſparency, making as it were darkneſs viſible.

It would be endleſs to enumerate the many admirable colouriſts of Flanders and Holland, who ſucceſſively trod the footſteps of the great artiſts above-mentioned: indeed, there are few painters of thoſe ſchools whoſe works may not be ſtudied with advantage as to this part of the art; the richneſs and harmony of their tints, the beauty and ſtrength of their chiaro-ſcuro, and the delicacy of their pencilling, compriſing their chief excellence. Sir Joſhua Reynolds, the great colouriſt of the laſt century, fully appreciated their merits; and by combining ſomewhat of their principle with the different ſtyles of Titian and Coreggio, has ſucceeded in producing, in not a few inſtances, a richneſs and brilliancy of colour, inferior, perhaps, to neither, and, at the ſame time, different from all. Happy for his reputation, if from an inſatiable deſire of ſurpaſſing, he had not, in ſo many of his pictures, indulged himſelf in the uſe of colours and varniſhes, which, like the more delicate bloſſoms of nature, are the earlieſt ſubject to decay.

We have been the more diffuſe in our attempt to characteriſe the principal maſters eminent for colouring, as we are aware that ſo little can be ſaid upon the preceptive part of this branch of art, which, more peculiarly than any other, ſeems to depend upon the delicacy and perfection of the organs of viſion, and the nice diſcriminations of feeling and judgment. The great artiſt laſt-mentioned was perhaps the only colouriſt who ever wrote upon colouring, and we ſhall therefore have recourſe to the aſſiſtance of his admirable diſcourſes, in our attempt to give ſome idea of the leading principles of this part of the art.

It has already been obſerved, that chiaro-ſcuro may exiſt in the greateſt perfection, independently of colours; but colouring, without the aid of lights and ſhadows, would preſent us nothing more than the geographical chart or the harlequin's coat; and the ſtudy of it muſt therefore neceſſarily imply ſome previous knowledge of chiaro-ſcuro.

In the commencement of this article we have, for the ſake of diſtinction, divided colouring into two kinds; the *neceſſary*, and the *expedient* or *ornamental:* the *neceſſary* that which denotes truth in the local tints of the objects repreſented; the *expedient* or *ornamental*, that upon which the diſtribution of the parts, and the harmony of the whole, depends. Although it might, upon firſt conſideration, appear difficult to ſay, which of theſe two kinds or diviſions of colouring requires the greateſt exertion of talent; yet there ſeems little doubt but that examples of a very high degree of truth in the local tints in pictures, are more rarely met with than an equal meaſure of beauty in the general arrangement of the colours. To this truth of local tint, therefore, the utmoſt effort of the artiſt ſhould be directed: nature will be his beſt guide, and next to her the works of Giorgione, Titian, and Giacomo Baſſano in figures, and thoſe of Claude and ſome of the Dutch ſchool in landſcape, and the other inferior departments of painting.

That ſpecies or diviſion of colouring, which we have termed the *expedient* or *ornamental*, is of a very extended range, and may be compared to rhetoric which gives additional luſtre to truth, and enables the orator, even where proof is wanting, to ſupport his argument upon ſpecious though fallacious grounds. By a judicious oppoſition of one colour to another, the ſkilful painter is enabled to give to each an increaſed delicacy or an additional ſplendour; and by the ſame means a colour may be made to appear different from that which it really is; and thus a ſemblance of truth in the local tint may be frequently attained, even where that truth is in reality very far from exiſting. If the tint of the fleſh be of too warm a hue, a yellow drapery placed next it, reſtores it to harmony; if too red, a crimſon or a ſcarlet mantle takes away or diminiſhes the imperfection; if it appear cold, blue or purple oppoſed to it gives it a proportionable degree of warmth: and thus by contraſting one colour with another, the painter is enabled to give to each the degree of value he deſires, according as his ſubject and the general effect of his work requires. It was the cuſtom of Rubens, when he wiſhed to give brilliancy to the principal figures in his picture, to oppoſe to the fleſh, a map of ſcarlet drapery, and another of pure white; by theſe means the tints of the naked parts acquired wonderful air of truth, at the ſame time that a ſplendid and harmonious effect was produced.

The balance of cold and warm colours in a picture ſeems to bear a ſtrong affinity to the gradation or contraſt of the chiaro-ſcuro, and demands equal attention. "A certain quantity of cold colours," ſays ſir Joſhua Reynolds, "is neceſſary to give value and luſtre to the warm colours;" he adds, "that the maſſes of light in a picture be always of a warm mellow colour, yellow, red, or a yellowiſh-white; and that the blue, the grey, or the green colours be kept almoſt entirely out of theſe maſſes, and be uſed only to ſupport and ſet off theſe warm colours; and for this purpoſe a ſmall proportion of cold colours will be ſufficient." "Let this conduct be reverſed;" continues this excellent writer, "let the light be cold, and the ſurrounding colours warm, as we often ſee in the works of the Roman and Florentine painters, and it will be out of the power of art, even in the hands of Rubens or Titian to make a picture ſplendid and harmonious. The illuminated parts of objects are in nature of a warmer tint than thoſe that are in the ſhade: what I have recommended therefore is no more than that the ſame conduct be obſerved in the whole, which is acknowledged to be neceſſary in every individual part. It is preſenting to the eye the ſame effect as that which it has been accuſtomed to feel, which in this caſe, as in every other, will always produce beauty; no principle therefore in our art can be more certain, or is derived from a higher ſource."

We have treated of the doctrine of reflections in our obſervations on chiaro-ſcuro; (ſee CLAIR, *Obſcure*) it is proper, however, in this place to obſerve, that the body which receives a reflected light, receives, together with that light, ſomewhat of the colour of the object which gives the reflection; and this, in proportion to the ſtrength of light on the body reflecting, and the vicinity of ſuch body to that receiving the reflection. The ſkilful management of reflections is ſo indiſpenſible a part of colouring, that it cannot employ too great a ſhare of the ſtudent's attention: an excellent inſight into the principles of it will be afforded him by the works of Rubens and Jordaens; not perhaps the leſs ſo from theſe maſters having marked the reflections in their pictures with a preciſion and diſtinctneſs, perhaps even beyond what is warranted by the appearances of nature herſelf.

With reſpect to the application of colouring, it ſhould always be remembered, that like the other parts of the art, it is of a nature powerfully to contribute to the ſentiment and expreſſion of a picture; when the ſtyle adopted is in ſtrict conformity with the character of the ſubject repreſented. This conformity is therefore the firſt thing to be conſidered. If the ſubject is awful or melancholy, a grave ſombre tone of colour will be appropriate; if gay or magnificent, the moſt brilliant and gorgeous tints may be freely uſed. The dark hue given by Michelagnolo Buonaroti to his celebrated group in the boat, in the laſt judgment, with the cold light behind it, renders it perhaps not leſs a maſterpiece of colour, than the Venus and Adonis of Titian, or the ſleeping Nymphs of Rubens.

The following remarks of the author before cited ſeem highly applicable to the preſent purpoſe. "To give a general air of grandeur at firſt view, all trifling or artful play of little lights, or an attention to a variety of tints is to be avoided; a quietneſs and ſimplicity muſt reign over the whole work; to which a breadth of uniform and ſimple colour will very much contribute. Grandeur of effect is produced by two different ways, which ſeem entirely oppoſed to each other. One is, by reducing the colours to little more than chiaro-ſcuro, which was often the practice of the Bolognian ſchools; and the other, by making the colours very diſtinct and forcible, ſuch as we ſee in thoſe of Rome and Florence; but ſtill the preſiding principle of both thoſe manners is ſimplicity. Certainly nothing can be more ſimple than monotony; and the diſtinct blue, red, and yellow colours which are ſeen in the draperies of the Roman and Florentine ſchools, though they have not that kind of harmony which is produced by a variety of broken and tranſparent colours, have that effect of grandeur which was intended. Perhaps theſe diſtinct colours ſtrike the mind more forcibly, from their not being any great union between them; as martial muſic, which is intended to rouſe the nobler paſſions, has its effect from the ſudden and ſtrongly marked tranſitions from one note to another, which that ſtyle of muſic requires; whilſt in that which is intended to move the ſofter paſſions, the notes imperceptibly melt into one another."

It is not our intention here to detail the various modes adopted by artiſts in mixing their colours and varniſhes, or the modes of preparing the different kinds of grounds uſed for painting on. Every ſchool, and, more or leſs, every individual differs in his practice from another; and works of ſo high a claſs have been produced by each of theſe different methods, that we muſt conclude them all to be right, when rightly applied. However, in one point, the beſt colouriſts ſeem to agree, that the light parts of a picture ſhould be painted with a ſtrong body of colour, and the ſhadows with as much tranſparency as poſſible: and this is the more natural as well the eaſieſt mode of procedure, as all the light colours, and particularly white, are opaque; whereas all the dark colours are in a greater or leſs degree tranſparent.

COLOURING *of Glaſs*. See GLASS.

COLOURING *of Earthenware*. See GLAZING.

COLOURING *Matter*. For a general account of the nature of colouring matter, ſee DYEING, *the art of*; for the principal colouring materials, ſuch as cochineal, indigo, madder, &c. ſee theſe articles reſpectively.

COLOURING *of Porcelain*. See PORCELAIN.

COLOURING *of Spirits*. See SPIRITS.

COLPE, in *Ancient Geography*, a town of Aſia Minor, built, according to Pliny, in the place of *Archæopolis*.

COLPEDI, or COLPIDICI, a people of Thrace, who inhabited the environs of Ænos. Steph. Byz.

COLPISCIS, a name given by ſome to the *falx Venetorum*, or ſickle-fiſh, commonly called the marmot fiſh by the people of Venice. See FALX.

COLPODA, in *Zoology*, a genus of animalcules *(vermes infuſiora)* diſtinguiſhed by being of a ſimple form, pellucid, flat, and ſinuate.

Theſe worms are inviſible to the naked eye. They have been diſcovered and examined, chiefly by Müller, Adams, Joblot, and other curious writers, whoſe attention has been particularly devoted to microſcopical inveſtigations. Of the genus colpoda, ſeven ſpecies only appear to be deſcribed.

LAMELLA. Elongated, membranaceous, and bent on the anterior part.

This reſembles a long, narrow, pellucid membrane, which is narrower and obtuſe behind, curved towards the upper part, and has a ridge or fold paſſing through the middle. It is found in water, and when it moves is obſerved to proceed on the edge inſtead of flat ſurface. Found in common water.

ROSTRUM. Oblong, and hooked on the anterior part.

Diſcovered in water more pure than the former. The poſterior part of this ſpecies is obtuſe, and one of the edges from the top to the middle is dilated, thick, and apparently triangular.

MELEAGRIS. Changeable, with the anterior part hooked, and the poſterior folded up.

Lives in water impregnated with vegetables, and is of a variable form, the anterior part clear, the poſterior full of molecules, with the margin ſinuous.

CUCULLUS. Ovate, ventricoſe, with an inciſion beneath the tip.

Generally oval, and containing from eight to twenty-four bright molecules, the margin irregular. Common in a variety of vegetable infuſions.

REN. Thick, and ſinuate in the middle.

Deſcribed by Joblot, who diſcovered it in the infuſions of hay. The form is ſlightly kidney-ſhaped, of a yellow colour, opake, and filled with molecules.

PYRUM. Convex, oval, the tip produced into a beak.

The body is tranſparent, of a pale colour, and filled with molecules.

HIPPOCREPIS. Thick, narrow in the middle, ſemilunar, and greeniſh. Found in ſtagnant meadow water.

COLPUSA, in *Ancient Geography*, one of the ancient names of *Chalcedon*, according to Pliny.

COLSA, a town of Aſia, placed by Ptolemy in Armenia.

COLSIR, in *Geography*, a town of Aſia, in the country of Thibet; 50 miles N.E. of Harachar-Hotun.

COLT, in *Zoology*. See FOAL and HORSE.

COLT's-*foot*, in *Botany*. See TUSSILAGO *Farfara*.

COLT's-*foot, alpine*. See CACALIA *Petaſites*.

COLTHENA, in *Ancient Geography*, placed by Ptolemy near the Araxes, and N. of Soducena.

COLTIE, among the *Timber Merchants*, a word uſed to expreſs a tree which has a defect in ſome one of its annual circles, which renders it unfit for many of the uſes it might have been otherwiſe fit for. In this caſe ſome one of the annual circles near the centre is perceived by the eye to be thicker than the reſt, and its ſap veſſels larger. It has an appearance much different from that of the others, and is ſo looſely connected both to its inveſtient, and inveſted circles, that, on ſawing a tranſverſe piece of the trunk off, it will ſlip out from the others, and ſo leave the heart looſe, and the reſt hollow, ſeeming to have been only fitted, not connected, to the others. In ſplitting the wood for other uſes, it yet more readily drops out, and the timber of ſuch a tree is therefore much leſs fit for general uſe than that of others. It is not eaſy to ſay to what accident, in the growth of the tree, this is owing, but it ſeems probable that it expoſes the tree to other accidents; in particular Bobart ſeems to think, that among the trees which were ſplit by the hard froſt, in the year 1683, while other trees of the like ſizes and kinds eſcaped, this *coltineſs* might be the occaſion of the miſchief, as well as of their being wind-ſhaken, or lagged. Philoſ. Tranſ. N° 165.

COLUBÆ, in *Ancient Geography*, a people of India, placed by Ptolemy on the other ſide of the Ganges, and near to it.

COLUBER, in *Zoology*, a genus of ſerpents diſtinguiſhed by having plates on the belly, and ſcales on the under parts of the tail.

The ſpecies of this genus are numerous. Linnæus deſcribes, upon the teſtimony of various writers, above ninety; and that number even has been conſiderably augmented by naturaliſts ſince his time. The ſpecies differ greatly in ſize and habit; ſome, as the vipers having the head large, flattiſh, and ſemi-cordated, with the body and tail of a moderate length, or rather ſhort; while others, as the greater part of the harmleſs ſerpents, have ſmall heads, with the body and tail much longer in proportion. In ſome, excluſive of the uſual ſcales under the tail, are a few ſcuta or undivided lamellæ, either at the beginning or towards the tip of the tail. The beſt works on this tribe of reptiles are "Synopſis methodica animalium Quadrupedum et Serpentini generis," of Ray. "Synopſis Reptilium," &c. of Laurenti; and thoſe of Seba and Cateſby. The obſervations of Boddaert, "Specimen novæ methodi diſtinguendi Serpentia." Nov. Act. Acad. Nat. Cur.; and "Beſchreibungeiner Schlange," &c. of Wiegel. The papers of Mr. Ellis, and another by Dr. Gray in the Philoſophical Tranſactions, relative to venomous ſerpents, are alſo intereſting. Several of thoſe deſcribed by count La Cepede deſerve particular attention. Profeſſor Pallas mentions ſome new kinds obſerved in Ruſſia and Siberia; others are mentioned by Sparrman, and a number of the viper tribe occur in the "Hiſtory of the Indian Serpents," publiſhed by the late Dr. Ruſſell.

Linnæus conſidered the number of abdominal plates and ſcales under the tail as a characteriſtic diſtinction of the different ſpecies of this genus; ſuch, however, is the inconſiſtency of this criterion that, in deſcribing the ſame ſpecies, ſcarcely two writers agree. Characters taken from the number of thoſe plates and ſcales in the ſerpent tribe, like thoſe from the number of rays in the fins of fiſhes, are not to be relied upon. The colours are liable to ſome variation; but the peculiar form and diſpoſition of the ſpots, lines, and other markings, afford, in general, a character by which the different ſpecies may be diſtinguiſhed.

Species.

VIPERA. Somewhat ferruginous, ſpotted with brown; beneath whitiſh; tail ſhort and mucronated.

Abdominal ſcuta 118, ſubcaudal ſcales 22. Linn. Haſſelq. Act. Upſ. 1750. *Aſpis Cleopatrae*, Laurenti.

This is the common viper of Egypt. Haſſelquiſt, who appears to have firſt deſcribed the ſpecies with accuracy, informs us, that it is imported in conſiderable quantities every year to Venice for the uſe of the apothecaries. Its ſize is ſomewhat ſmaller than that of the common viper; the head not ſo flat on the top, but very protuberant on each ſide; ſnout very obtuſe. The body is thick towards the middle, and ſomewhat quadrangular, but thin, and cylindric towards the head and tail, which laſt is ſhort, ſlender, conical, and terminated by a ſlightly incurved horny point or tip. The ſcales on the upper parts are oval and carinated. Haſſelquiſt deſcribes this ſpecies as being about two ſpans in length, excluſive of the tail, which meaſures only an inch. This is ſuppoſed by ſome to be the aſp, by the bite of which the celebrated Cleopatra determined rather to die than ſubmit to be carried captive to Rome, to grace the triumph of Auguſtus. Mr. Bruce, on the contrary, conſiders the Ceraſtes to be the ſpecies employed on that momentous occaſion. Schneider is of opinion, that the Egyptian viper (C. vipera) muſt be the true *dipſas* of the ancients, a reptile which was popularly reported to kill by occaſioning the moſt exceſſive thirſt.

VARIEGATUS. Above cheſnut, variegated with grey and white; beneath, and on the ſides, pale yellow. *Aſpis variegata*, Laur. Amph. Seba, &c.

Conſidered as a native of America, and reſembles the laſt.

VENOSUS. Reddiſh aſh, with white tranſverſe veins; head long. *Aſpis cobella*, Laur. Amph. Seba.

A native of America, and is probably only a variety of C. vipera.

INTESTINALIS. Body equal, ſlender, with a lateral and longitudinal dorſal line, the laſt furcated near the eyes. Laur. Amph. Seba.

Inhabits Africa, and like the former is perhaps merely a variety of C. vipera.

BERUS. On the head a bilobate ſpot; body above cinereous (or reddiſh) with a black flexuous zig-zag ſtripe down the back, and belly purpliſh. *Coluber berus*, abdominal ſcuta 146, ſubcaudal ſcales 39. Linn. Fn. Suec. Amoen. Acad. 148—42. Weigel Abh. der Hall. 177—86. Scop. *Vipera.* Geſner Aldr.

This is the common Engliſh viper, and which is not only frequent in this country, but appears to be generally diffuſed over the reſt of Europe, and ſome parts of Aſia. If the varieties, deſcribed by Gmelin, are of the ſame ſpecies, it extends alſo as far as India. The var β of this author has the ſpots on the top of the head roundiſh, and ſomewhat confluent or running into a ſtripe; thoſe near the tail tranſverſe. This inhabits India. γ. Reddiſh with the head variegated; neck ſlender. A native of St. Euſtace. δ. The arch of the hind head intercepting a white ſpot. Inhabits India. ε. Spot on the head multipartite. Inhabits the Celebes. The whole of thoſe varieties are deſcribed and figured in the works of Seba.

Though the viper varies conſiderably in colour from a pale cinereous or yellowiſh ferruginous to deep or dull brown, the varieties agree in being marked with a continued ſeries of confluent rhomboid blackiſh ſpots, extending from the head to the tail. The head is broad, and ſomewhat flattened, and is more or leſs protuberant on each ſide at the back part; the front of the head is blackiſh, and on the upper part is a large divided and ſomewhat heart-ſhaped ſpot, the obtuſe diviſions of which are directed backwards; the lips are ſomewhat barred or variegated with black and light grey, and along each ſide of the body runs a row of roundiſh ſubtrigonal duſky ſpots, continuing to the end of the tail. The ſcales on the upper part of the body are carinated, the under parts of a blackiſh colour, with a blueiſh gloſs ſomewhat reſembling that of poliſhed ſteel. The general length of the viper is from eighteen inches to two feet, and it is affirmed by ſome writers to grow even to the length of three feet. The fangs of the viper, like thoſe of other poiſonous ſerpents, are ſituated on each ſide the fore part of the upper jaw, and are generally two in number, with a few ſmaller ones ſituated behind. The poiſon, as uſual, lies in a receptacle at the baſe of the fangs, and being perforated, when the animal bites, the compreſſion of thoſe receptacles forces out a drop of the poiſonous fluid, which paſſing through the aperture of the fangs is immediately inſtilled into the wound. The tongue is forked, and being ſoft and flexible is ſuſceptible of great extenſion: it may be perhaps ſuperfluous to add that this tongue is altogether incapable of inflicting any wound, or injecting poiſon, as ſome ancient writers credulouſly affirm; it may aſſiſt the animal in the capture of its inſect prey. The French naturaliſts are inclined to believe it is intended by nature to ſupply ſome defect of tranſpiration in the ſkin.

Hitherto the viper has been conſidered the moſt poiſonous of the European ſerpents, and many inſtances are recorded of the fatal effects reſulting from its bite. That the bite of this ſerpent is always productive of pain and temporary inflammation in the parts bitten is very evident; ſometimes alſo the ſymptoms may become alarming, or, in a few inſtances, through neglect or injudicious treatment of the wound, may even prove fatal; but upon the whole the bite of this creature does not appear pregnant with all thoſe dangers which the terrors and prejudices of the vulgar lead them to ſuppoſe. In England the bite of the viper is rarely attended with fatal conſequences. Fontana ſeems to doubt whether any well atteſted inſtance can be adduced of the viper having killed any perſon by its bite, even in the warm climate of Italy. The teſtimonies of authors, both as to the nature of the poiſon itſelf, and its effects on the animal frame are, however, confeſſedly at variance. According to Dr. Mead, and his aſſociates in the experiment, the poiſon of the viper, diluted with a little warm water, proved ſharp and fiery when taſted with the tip of the tongue, as if the tongue had been ſtruck through with ſomething ſcalding or burning. This ſenſation went off in two or three hours; but one gentleman, who would not be ſatisfied without trying a large drop undiluted, found his tongue ſwelled with a little inflammation; and the ſoreneſs laſted two days. On the contrary, abbé Fontana and ſome others deſcribe it as of no particular acrimony of taſte, but rather reſembling oil or gum, and Dr. Ruſſell, in his work on Indian ſerpents, affirms the ſame even of the poiſon of the cobra de capello. Boerhaave is of opinion that the poiſon of the viper may be taken into the ſtomach without danger, and quotes the caſe of Jacob Sozzi, who, at the court of the duke of Tuſcany, is ſaid to have ſwallowed three drams of this poiſon without experiencing any ill effects This poiſon, ſays Boerhaave, is rendered inactive by digeſtion in the ſtomach and bowels, ſo that it will not afterwards exert its ſad effects upon the blood; for a whole ounce of the venom taken by the mouth will not kill an animal, when, at the ſame time, a ſmall needle only, dipped in the ſame fluid, taking up perhaps no more than a hundredth part of a drop, and then thruſt into the blood of the living animal, almoſt infallibly kills. Fontana, on the contrary, affirms, that though the poiſon of the viper adminiſtered internally may not produce the ſame violent ſymptoms as the bite, that it cannot be taken with impunity. The opinion, pretty generally entertained among the ancients, ſeems to be in favour of the aſſertions of Boerhaave.

"The ſymptoms which follow the bite of the viper (according to Dr. Mead) when it faſtens either one or both its greater teeth or fangs in any part of the body, is an acute pain in the part wounded, with a ſwelling at firſt red, but afterwards livid, which, by degrees, ſpreads further to the neighbouring parts, and occaſions great faintneſs, and a quick, though low and ſometimes interrupted pulſe; great ſickneſs at the ſtomach, with bilious, convulſive vomitings, cold ſweats, and ſometimes pain about the navel; and if the cure be not ſpeedy, death itſelf, unleſs the ſtrength of nature prove ſufficient to overcome thoſe diſorders: and though it does, the ſwelling ſtill continues inflamed for ſome time; nay, in ſome caſes, more conſiderably upon the abating of the other ſymptoms than at the beginning; and often from the ſmall wound runs a ſanious liquor, and little puſtules are raiſed about it: the colour of the whole ſkin, in leſs than an hour, is changed yellow, as if the patient had the jaundice. Theſe miſchiefs (although different climates, ſeaſons of the year more or leſs hot, the greater or leſs rage of the viper, the animal itſelf being of a larger or ſmaller ſize, and conſequently able to communicate more or leſs venom, the wound made deeper, in a part more nervous or tendinous, and therefore receiving more of the poiſonous liquor, and the like circumſtances may variouſly heighten or abate them,) yet uſually diſcover themſelves much after the ſame manner in all; unleſs the bite happen not to be accompanied with the effuſion of that liquor, which is the main inſtrument and cauſe of this violent and ſhocking diſturbance." Dr. Mead cauſed ſeveral animals, as dogs, cats, and pigeons to be bitten by an enraged viper, which animals generally died, ſome in a longer and others in a ſhorter ſpace of time; but it was obſerved that, immediately after being bitten, they all exhibited ſigns of acute pain as if affected with ſickneſs, faintings, and convulſions. The venomous properties of the poiſonous fluid of the viper is not deſtroyed even by the death of the animal, as was proved by Dr. Mead; he took the head of a large viper that lay three hours after it was cut off, and was perfectly flaccid and without motion, and wounded a pigeon on the thigh by the fangs of the head; the bird preſently became convulſed, and died ſeven hours after. The Scythians, as Pliny relates, muſt have been aware that the poiſon of the viper would retain its venomous properties after being taken from the animal and dried, for they were accuſtomed to dip their arrows into its poiſon; this they previouſly prepared by mixing it with human blood.

From the following experiment it would ſeem that no very material difference takes place in the appearance of an animal killed by the bite of the viper, than if its death were occaſioned by any other caſe. To aſcertain this fact, a viper, being enraged by the members of the Tuſcan academy, and then ſuffered to bite the noſe of a ſtrong bull, the animal expired in a ſhort time, and being opened by the moſt expert anatomiſts, no uncommon alteration could be perceived either in the ſolid or fluid parts of the beaſt.

The viper, though ſo much dreaded on account of its bite has been very highly eſteemed both by the ancients and moderns as a reſtorative and ſtrengthening diet. The ancients uſed the fleſh of this ſnake in leprous and other caſes. The Greek phyſician Craterus, cured, as Porphyrius relates, a miſerable ſlave, whoſe ſkin, in a ſtrange manner, fell off from his bones, by adviſing him to feed on viper's fleſh in the manner of fiſh. Galen ſays, that thoſe afflicted with elephantiaſis are wonderfully relieved by eating viper's fleſh dreſſed like eels, and relates very remarkable cures of this diſeaſe performed by means of viper wine. In France and Italy, the broth, jelly, and fleſh of vipers is in much eſteem as a reſtorative medicine. In England we have to inſtance the well known circumſtance of ſir Kenelm Digby, who cauſed his wife lady Venetia to feed on capons fatted with vipers to recover her from a conſumption. According to Dr. Lewis, the dried fleſh of the vipers poſſeſſes none of the nutritious properties of the recent animal, and is totally inſignificant. A volatile ſalt was formerly drawn from vipers and ſold at a great price as a ſovereign remedy againſt the bites of vipers, and other poiſonous animals, but it is now found not to be materially different from the volatile alkaline ſalts procured by diſtilling other animal ſubſtances.

The viper abounds moſt in dry, ſtony, and chalky countries, or in the low herbage or underwood in thickets. It caſts its ſkin twice in the year, namely, in ſpring and autumn, and is ſaid to attain its full ſize at the age of ſix or ſeven years, but are capable of engendering when two or three years old. They copulate in May, and go about three months with young. "The viper (ſays Mr. White) is vivaparous, producing its young towards the cloſe of ſummer. On the 4th of Aug. 1755, we ſurprized a large female viper, which ſeemed very heavy and bloated as it lay on the graſs, baſking in the ſun. When we came to cut it up, we found that the abdomen was crouded with young, fifteen in number; the ſhorteſt of which meaſured full ſeven inches, and were about the ſize of full grown earth worms. This little fry iſſued into the world with the true viper ſpirit about them, ſhewing great alertneſs as ſoon as diſengaged from the belly of the dam: they twiſted and wriggled about, and ſet themſelves up, and gaped very wide, when touched with a ſtick, ſhewing manifeſt tokens of menace and defiance, though as yet they had no manner of fangs that we could find, even with the help of our glaſſes." In the month of May a female viper was opened, which had in it a chain of eleven eggs, about the ſize of thoſe of a black bird, but not ſo far advanced as to ſhew the rudiments of the young. Several intelligent folks (adds Mr. White) aſſure me that they have ſeen the viper open her mouth, and admit her helpleſs young down her throat on ſudden ſurprizes, juſt as the opoſſum does her brood into the pouch under her belly upon the like emergencies; and yet the London viper catchers inſiſt on it to Mr. Barrington that no ſuch thing ever happens.

Sir Thomas Brown ſeems inclined to believe this circumſtance: the young, he obſerves, ſuppoſed to break through the belly of the dam, will, upon any fright, for protection, run into it; for then the old one receives them into her mouth, which way, the fright being paſt, they will return again, which is a peculiar way of refuge, and although it ſeems ſtrange is avowed by frequent experience and undeniable teſtimony. The ſame is aſſerted by ſome other writers of no mean reſpectability.

The enemies of the viper are numerous, the herons in particular deſtroy vaſt numbers. Their prey conſiſts of frogs, toads, lizards, mice, and various ſmall quadrupeds. The viper is capable of ſupporting a very long abſtinence; it being known that ſome have been kept in a box without food for ſix months, and yet did not abate of their vivacity. They feed only for a ſhort period annually, and as a viper has been known to be a whole month devouring and digeſting a frog or toad, two ſuch meals would be ſufficient to ſupport it for a twelve month. It is remarked, that they never eat during confinement, for if mice, their favourite food be thrown into their box, though they will kill they never eat them. The violence of their poiſon decreaſes in proportion to the length of their confinement. Vipers, when at liberty, remain torpid throughout the winter, but when confined have never been known to take their annual repoſe. The beſt method of catching them is by putting a cleft ſtick on or near the head, then ſeizing them by the tail, and inſtantly dropping them into a bag. The viper catchers are frequently bit, but it is ſeldom the wound proves fatal: oil of olives, or ſalad oil, is ſaid to be the moſt effectual remedy. M. Sonnini ſeems fully ſatisfied of the efficacy of *eau de luce* as an antidote to the poiſon of vipers as well as other venomous ſerpents, the good effects of which he tells us he has experienced on ſeveral occaſions, and particularly at Guiana, where ſnakes are equally numerous and formidable. In his travels through Greece and Turkey, M. Sonnini mentions an inſtance of a child he ſaw at Sifour, three or four hours after it had been bitten by a vipour or venomous ſnake, in the ſmall of the leg. Both the leg and foot were much ſwelled, very hard, and of a blueiſh colour: the child ſuffered great pain, the wound no longer appeared, and the place was not diſtinguiſhed but by a larger ſwelling, and by pains more acute, which were occaſioned by touching it. He made the child ſwallow a few drops of *eau de luce* in half a glaſs of wine, and after ſome ſcarifications on the part bitten applied to it, a compreſs, ſteeped in this ſame water, which is known to be compoſed of volatile alkali and oil of amber. The reſult of this treatment was, that four hours after, the ſwelling was conſiderably diminiſhed; the child no longer felt any [illegible] and became tranquil; the compreſs of *eau de luce* was [illegible] renewed, and the child left in a fair ſtate for recovery. The ſame application is recommended by Sonnini in all [illegible]s; he obſerves, that the ſwelling of the wounded [illegible] ſpeedily diminiſhed, and the pain entirely removed by this means; but the *eau de luce* muſt be taken internally, according to this writer, as well as applied to the wound externally, in order to produce the deſired effect. The remedies which the Greeks commonly employ for curing the bite of ſnakes, as Sonnini affirms, conſiſt in cataplaſms of emollient plants, calculated to promote ſuppuration. Sow thiſtle is reckoned among them to poſſeſs, particularly, a ſpecific virtue againſt this ſort of venom. But this treatment, he adds, is very long; it frequently laſts two months, and never leſs than one; neither is it always ſucceſsful, and death pretty frequently carries off the patient from the torments which this mode of treatment cauſes him to ſuf[illegible].

PRESTER. Black, with deep black, dentated, dorſal line. *Coluber preſter*, abdominal ſcuta 152, ſubcaudal ſcales 32. Linn. Fn. Suec. 287. Lepech Itin. *Coluber vipera anglorum*, Laur. *Vipera anglica nigricans*, Petiv. Muſ.

This is the black viper of Engliſh authors, and which ſo completely reſembles the common viper in every particular, except the colour, that we are ſtrongly inclined to admit it as a mere variety of that ſpecies. The black viper of Auſtria appears from a ſeries of experiments made by Laurenti to be innoxious, ſince pigeons and chickens expoſed to its bite were no otherwiſe injured than by mere puncture without ſuffering any ſymptoms of poiſon, but it is not entirely certain that the kind deſcribed by Laurenti is of the ſame ſpecies as the black viper generally found in Europe, and which is almoſt univerſally allowed to be as poiſonous as the common viper.

Preſter inhabits the northern parts of Aſia as well as Europe.

CACODÆMON. Deep black; head broad and tumid; body thick. *Black viper*. Cateſby, Carol.

This kind is about the ſize of the common viper, but of a much thicker form, and entirely of a ruſty black colour; it is ſlow in its motions, and, when irritated, dilates the head, which is naturally large, to a ſurpriſing width, and threatening at the ſame time with a horrid hiſs; the fangs are large, and the animal is ſaid to be as dangerous as the rattle ſnake.

It is a native of Carolina, inhabiting chiefly the higher grounds.

CHERSEA. Duſky-bay, with black flexuous dorſal band, and the head oval, and whitiſh beneath. *Coluber cherſea*, abdominal ſcuta 150, ſubcaudal ſcales 34. Linn.

Inhabits the woody parts of Sweden, and is ſaid to be moſt frequent in the province of Smoland, where it is greatly dreaded by the inhabitants, who conſider its bite as mortal, unleſs the part bitten be immediately cut out. In the "Memoirs of the Swediſh Academy" is an account of a young man, a labourer, bit by this animal on the toe of the left foot. In the ſpace of ſix hours, the whole leg and thigh were red and ſwelled; the pulſe intermitted, and the patient was oppreſſed with pains in the head and bowels. The firſt day the patient drank a glaſs of the juice expreſſed from aſh-leaves mixed with wine every half hour, and had beſides a cataplaſm of the bruiſed leaves applied to the wound: in the evening alſo, he took a glaſs of warm olive oil. By theſe means the patient was greatly relieved, ſlept well during the night, and found the ſwelling much reduced by the next morning; but neglecting to repeat the remedies the firſt ſymptoms returned, and were again diſſipated by the ſame applications, and in two or three days the patient recovered. Linnæus attempted to cure a women wounded by the bite of a viper of this kind by means of olive oil, but his endeavours were unſucceſsful, and his patient died.

The *coluber cherſea* reſembles the common viper, but ſtill more the common aſp, though inferior in ſize, not often exceeding a ſpan in length. The colour is a duſky rufous brown, with a flexuous dorſal band of a deeper colour; the head ovate, of a pale colour, and marked with a heart-ſhaped duſky ſpot, the diviſions of which are directed backwards, and the body is round.

SCYTHA. Deep black above, beneath milk white, and poliſhed. *Coluber ſcytha*, abdominal ſcuta 153, ſubcaudal ſquamæ 31. Pallus It.

Inhabits woods in the mountainous parts of Siberia, where it was obſerved by Dr. Pallas. This ſpecies is not eſtemeed very poiſonous, and is of a ſmall ſize, ſeldom exceeding nine inches in length, or the thickneſs of a finger; the head is ſomewhat heart-ſhaped.

REDI. Head imbricated with very minute ſcales; body ferruginous, with a quadruple tranſverſe dorſal ſeries of ſhort brown ſtreaks. *Coluber redi*, abdominal ſcuta 152, ſubcaudal ſquamæ 33. Gmel. *Vipera franciſci redi*, Laur. *Otter*, Meyer Thiere.

Allied to the common viper, but eſteemed more poiſonous; it differs in being marked throughout the whole length of the upper parts, with a quadruple ſeries of ſhort, tranſverſe, alternate ſtreaks, of which the intermediate ones are often confluent. The colour of the underparts is rufous, eſpecially towards the head and tail. This kind is found in Auſtria and Italy near the ſea.

CERASTES. Sub-ferruginous, with brown tranſverſe ſpots, and horned eye-lids *Coluber ceraſtes*, abdominal ſcuta 150, ſubcaudal ſcales 25. Haſſelq. Act. Upſ. 1750. Linn. *Ceraſtes ex lybia*, Aldr. *Ceraſtes*, Bellon, Ellis Phil. Tranſ. *Ceraſtes*, Bruce's Travels Append. *La vipère céraſte*, La Cepède.

The ceraſtes viper grows to the length of eighteen inches or two feet, and is diſtinguiſhed by a pair of horns, or curved proceſſes ſituated above the eyes and pointing forwards; theſe horns have nothing analogous in their ſtructure to thoſe of quadrupeds, neither are they to be conſidered as weapons either offenſive or defenſive, but they contribute to give the animal an appearance of more than ordinary malignity. The ceraſtes is a native of many parts of Africa, and is found principally in ſandy deſerts and dry places. In Syria and Arabia it is particularly frequent, and is alſo found in many parts of Egypt.

The general colour of this ſnake is a pale yellowiſh or reddiſh brown, with darker ſpots diſpoſed at a diſtance from each other, and in a ſomewhat tranſverſe direction along the back, and near the ſides, the belly is blueiſh, or of a pale lead colour, and ſome writers ſay occaſionally almoſt white. In its manners the ceraſtes bears a very great affinity to the common viper, but is ſtill more to be dreaded than that ſpecies, as its bite is very dangerous, and the animal is ſaid to ſpring ſuddenly to a conſiderable diſtance, and aſſail without provocation thoſe who happen to approach it.

According to Mr. Bruce, the ceraſtes inhabits the greateſt part of the eaſtern continent, eſpecially the deſert ſandy part of it. It abounds in the three Arabias, and in Africa, I never ſaw (ſays Mr. Bruce) ſo many of them as in the Cyrenaicum, where the jerboa is frequent in proportion. He is a great lover of heat; for though the ſun was burning hot all day, when we made a fire at night, by digging a hole and burning wood to charcoal in it for dreſſing our victuals, it was ſeldom we had fewer than half a dozen of theſe vipers, who burnt themſelves to death by approaching the embers. The general ſize of the ceraſtes from the extremity of its ſnout to the end of the tail, Mr. Bruce tells us, is from thirteen to fourteen inches; in the Britiſh Muſeum, however, is a ſpecimen meaſuring rather more than two feet, and in that of Paris another ſtill larger. The head is triangular, very flat, but higher near where it joins the neck than towards the noſe. The length of its head, from the point of the noſe to the joining of the neck, is ten-twelfths of an inch, and the breadth nine-twelfths of an inch; between its horns is three-twelfths. The opening of its mouth, or rictus oris, is eight-twelfths; its horns in length three-twelfths; its large canine teeth ſomething more than three twelfths and a half; its neck at the joining of the head four-twelfths; the body, where thickeſt, ten-twelfths; its tail, at the joining of the body, two twelfths and a half; the tip of the tail one-twelfth; the length of the tail an inch and three-twelfths; the aperture of the eye two-twelfths, but this varies according to the impreſſion of light. The ceraſtes has ſixteen ſmall immoveable teeth, hollow, crooked, inwards, and of a remarkably fine poliſh, white in colour, inclining to blueiſh; nearly one-fourth of the bottom are ſtrongly fixed in the upper jaw, and folds back like a claſp knife, the point inclining inwards, and the greateſt part of the tooth is covered with a green ſoft membrane, not drawn tight, but, as it were wrinkled, over it, immediately above this, is a ſlit along the back of the tooth, which ends nearly in the middle of it, where the tooth curves inwardly. From this aperture, Mr. Bruce imagines, and not without reaſon, that the ceraſtes ſheds its poiſon, inſtead of from the point, where, with the beſt glaſſes he could never perceive an aperture; ſo that the tooth is not a tube, but hollow only half way; the point being calculated for making the inciſion, and by its preſſure occaſioning the venom in the bag at the bottom of the fang to riſe in the tooth, and ſpill itſelf through the ſlit into the wound. By this flat poſition of the tooth along the jaw, and its being defended by the membrane, it eats in perfect ſafety; for the tooth cannot preſs the bag of poiſon at the root, while it lies in this poſition, nor can it riſe in the tube to ſpill itſelf, nor can the tooth make any wound ſo as to receive it; but the animal is ſuppoſed to eat but ſeldom or only when it is with young. This viper has only one row of teeth. The poiſon is very copious for ſo ſmall a creature, being fully as much as a drop of laudanum dropped from a phial by a careful hand; it is of a yellow colour, and viewed through a glaſs is not perfectly tranſparent or pellucid.

During the day time the ceraſtes hides itſelf in the ſand, where it lives in dens ſimilar to thoſe inhabited by the jerboa. Mr. Bruce kept two of the ceraſtes in a glaſs jar, ſuch as is uſed for keeping ſweetmeats in, for the ſpace of two years, without having given them any food; they did not ſleep that he obſerved in winter, but caſt their ſkins the laſt days of April. The ceraſtes moves with great rapidity, and in all directions, forward, backward, and ſideways When he inclines to ſurpriſe any one, who is too far from him, he creeps with his ſide towards the perſon, and his head averted, till judging his diſtance, he turns round, ſprings upon him, and faſtens upon the part next to him. Mr. Bruce ſaw one of them in a houſe at Cairo crawl up the ſide of a box in which there were many, and there lie ſtill as if hiding himſelf,

ſelf, till one of the people who brought them to us, came near him, and though in a very diſadvantageous poſture, ſticking, as it were, perpendicular to the ſide of the box, he leaped near the diſtance of three feet, and faſtened between the man's fore-finger and thumb, ſo as to bring the blood. The man ſhewed no ſign of either pain or fear, and Mr. Bruce and his party kept him with them full four hours without his applying any ſort of remedy, or ſeeming inclined ſo to do. To make himſelf aſſured that the animal was in its perfect ſtate, Mr. Bruce make the man hold the ceraſtes by the neck, ſo as to force him to open his mouth, and lacerate the thigh of a pelican, a bird he had tamed as large as a ſwan. The bird died in about thirteen minutes, though it was apparently affected in about fifty ſeconds, and this even can ſcarce be conſidered as a fair trial, becauſe a few minutes before it had bit the man, and ſo diſcharged part of its virus, and it was made to ſcratch the pelican by force, without any irritation or action of its own.

It appears not only on the teſtimony of the above circumſtance, but on the relations of travellers in general of the greateſt reſpectability, that the natives of the countries infeſted by the ceraſtes, have a method of charming, or rather ſtupefying theſe and other ſerpents to prevent their biting, or to render their bite innoxious, however irritated the animal may be. Some pretend to poſſeſs preternatural powers over thoſe reptiles, while others ſay, they have certain preparations with which they anoint themſelves to obviate the fatal conſequences of their bite, and which is never ineffectually employed. Mr. Bruce ſpeaks at ſome length on this intereſting topic "a long diſſertation (ſays this writer,) would remain on the incantation of ſerpents. There is no doubt of its reality, the ſcriptures are full of it, all that have been in Egypt have ſeen as many different inſtances as they choſe. Some have doubted that it was a trick, and that the animals ſo handled, had been firſt trained and then diſarmed of their power of hurting; and, fond of their diſcovery, they have reſted themſelves upon it without experiment, in the face of all antiquity. But I will not heſitate to aver that I have ſeen at Cairo, (and this may be ſeen daily without trouble or expence) a man who came from above the catacombs, where the pits of the mummy birds are kept, who has taken a ceraſtes with his naked hand, from a tumber of others lying at the bottom of the tub, has put it upon his bare head, covered it with the common red cap he wears, then taken it out, put it in his breaſt and tied it about his neck like a necklace; after which it has been applied to a hen and bit it, which has died in a few minutes; and, to complete the experiment the man has taken it by the neck, and beginning at the tail has ate it as one would do a carrot, or ſtock of celery, without any ſeeming repugnance."

"We know from hiſtory, that where any country has been remarkably infeſted with ſerpents, there the people have been ſcreened by this ſecret. The Pſylli and Marmarides of old, undoubtedly were defended in this manner."

> "Ad quorum cantus mites jacuere caraſtæ."
> Sil. Ital. lib. iii.

"To leave ancient hiſtory, I can myſelf avouch, that all the black people in the kingdom of Sennaar, whether Fungee, or Nuba, are perfectly armed againſt the bite of either ſcorpion or viper. They take the ceraſtes in their hands at all times, put them in their boſoms, and throw them at one another, as children do apples or balls, without having irritated them by this uſage ſo much as to bite. The Arabs have this ſecret naturally, but from their infancy they acquire an exemption from the mortal conſequences attending the bite of theſe animals, by chewing a certain root and waſhing themſelves, (it is not anointing) with an infuſion of certain plants, in water. One day when I was ſitting with the brother of Shekh Adelan, prime-miniſter of Sennaar, a ſlave of his brought in a ceraſtes, which he had juſt taken out of a hole, and was uſing with every ſort of familiarity; I told him my ſuſpicion that the teeth had been drawn, but he aſſured me they were not, as did his maſter, Kitton, who took it from him, wound it round his arm, and, at my deſire, ordered the ſervant to carry it home with me. I took a chicken by the neck and made it flutter before him, his ſeeming indifference left him, and he bit it with ſigns of anger, the chicken died almoſt immediately;—I ſay his ſeeming indifference, for I conſtantly obſerved that however lively the viper was before, yet, upon being ſeized by any of theſe barbarians, he ſeemed as if taken with ſickneſs and feebleneſs, frequently ſhut his eyes, and never turned his mouth towards the arm of the perſon who held him. I aſked Kitton how they came to be exempted from this miſchief? He ſaid they were born ſo, and ſo ſaid the grave and reſpectable men among them. Many of the lighter and lower ſort talked of enchantments by words and by writing, but they all knew how to prepare any perſon by medicines, which were decoctions of herbs and roots. I have ſeen many thus armed for a ſeaſon, do pretty much the ſame feats as thoſe who poſſeſſed the exemption naturally; the drugs were given me, and I ſeveral times armed myſelf, as I thought, reſolved to try the experiment; but my heart always failed me when I came to the trial; becauſe, among thoſe wretched people. it was a pretence that they might very probably have ſheltered themſelves under that I was a Chriſtian, and that it had no effect upon me. I have ſtill remaining by me a ſmall quantity of this root, but never had an opportunity of trying the experiment."

Among the writers of antiquity we find abundant mention of the Pſylli, or ſerpent-eaters; men who pretended to poſſeſs the inherent power of charming ſerpents, and of devouring them without danger. Lucan ſpeaks of the practice of the Pſylli, or African tribes, and informs us they were employed by Cato to attend his expedition through the Lybian deſerts, for the recovery of his ſoldiers bitten by ſerpents. Strabo tells us the Pſylli, or men of Crene, poſſeſſed a ſecret antidote againſt the poiſon of thoſe reptiles. It appears equally certain that there are tribes of men in the Eaſt, who, to this day practiſe the ſame arts. Savary relates that when at Roſetta, he was preſent at the feſtival of Sidi Ibrahim, in which the rear of a proceſſion compoſed of the different trades, and cheiks, or prieſts of the country, bearing the ſtandard of Mahomet, was brought up by a troop of theſe modern Pſylli. Thoſe men, ſays Savary appeared frantic, with naked arms, their eyes wild, and enormous ſerpents in their hands, which twined round their bodies and endeavoured to eſcape. They ſeized the ſerpents forcibly by the neck, avoided their bite, and, regardleſs of their hiſſes, tore them with their teeth and eat them alive, while the blood ſtreamed from their defiled mouths; other Pſylli ſtruggled with them to free away their prey, for the contention was who ſhould devour a living ſerpent!—The aſtoniſhed populace followed, and cried—a miracle!

The remarks of Sonnini, one of the lateſt writers on this ſubject, may not prove unintereſting in concluſion. "The Eaſt, ſays he, was at all times the country of magicians: men boaſting to have the power of charming ſerpents, of braving their bite, and their venom, of rendering them docile to their voice; they formerly exiſted there under the name of Pſylli, and there are ſtill to be found, people who pretend to have inherited their ſecrets. I knew one of thoſe verſed in this kind of faſcination; he was certainly the moſt ignorant, and moſt fooliſh of the Greeks: his ſecret conſiſted chiefly in thirteen words, which it was neceſſary to pronounce in ſight of the ſerpents. He told me alſo, that, in order to guard againſt the bite of theſe reptiles, it was neceſſary to try to take one alive with the precaution of ſeizing it ſtrongly by the neck ſo as to prevent it from biting, and not to concern myſelf about the body and tail, the twiſtings of which lightly ſqueeze the arm. You muſt then ſlip round its neck a running knot made with coarſe thread, and draw it tight by degrees till the animal is ſtrangled. When it is on the point of dying, you open it and take out its fat, with which you rub your hands; then ſaid my modern Pſyllus to me, you have nothing more to fear from the bite of every ſpecies of ſerpent."

The figure of ceraſtes, occurs frequently among the hieroglyphic characters inſcribed upon remains of Egyptian antiquity.

Nasicornis. Somewhat olivaceous yellowiſh, variegated with black; flexuous, lateral band pale, and two horns on the ſnout. *Coluber naſicornis*, horn-noſe ſnake. Shaw Gen. Zool.

This remarkable ſnake was firſt deſcribed by Dr. Shaw in the Naturaliſt's Miſcellany. The moſt ſtriking peculiarity of his ſpecies are the two large ſharp pointed horns, ſituated on the top of the noſe, or anterior part of the upper jaw. Theſe horns ſtand nearly upright, but incline ſlightly backwards, and a little outwards on each ſide, and are of a ſubſtance ſomewhat flexible; their ſhape is rather triangular. The length of thoſe horns is about half an inch, and at the baſe of each ſtands an upright ſtrong ſcale, of nearly the ſame ſhape with the horn itſelf, and thus giving the appearance of a much ſmaller pair of horns. The mouth is furniſhed with extremely large and long fangs, or poiſonous teeth, two of which appear on each ſide of the mouth; the hinder pair being ſmaller. The length of this animal is about thirty-five inches. Its colour is yellowiſh, olive-brown, very thickly ſprinkled all over with minute blackiſh ſpecks. Along the whole length of the back, extends a ſeries of yellowiſh-brown oblong ſpots, or marks, each of which is imbedded in a patch of black; and on each ſide of the body from head to tail runs an acutely flexuous, or zig-zag line, or narrow band of an ochre colour, which is bounded beneath by a much deeper or blacker ſhade, than on the reſt of the body. The belly is a dull ochre colour or cinereous yellow, freckled with blackiſh ſpots and markings, and beſides theſe a number of black ſpots of various ſizes are ſparingly diſperſed over the whole animal; the tail is ſomewhat thin and ſhort in proportion to the body. The ſcales are hard, ſtiff and ſtrongly carinated, the head is covered with ſmall ſcales, and is marked on the upper-part by a longitudinal patch of brown, running out into pointed proceſſes at the ſides, and bounded by a ſpace of dull lead colour or cinereous. The ſhape of the head is broad and flattened, the cheeks varied with black and yellow marks. The horned ſnake is ſuppoſed to be a native of the interior parts of Africa. The ſpecimen above deſcribed, was obtained from the maſter of a Guinea veſſel by the Rev. Edward Charles Jenkins of Charleſtown in South Carolina.

Aspis. Noſe terminated by an erect wart; body rufous, with alternate, roundiſh, duſky, diſtinct, and confluent ſpots; beneath ſteel blue dotted with yellow. *Coluber aſpis*, abdominal ſcuta 146, ſubcaudal ſcales 46. Gmel. 146—34, Strom. Sondm. Col.—*Vipera moſis charas*. Laur. Amph. p. 100. n. 219.

Conſidered by ſome as a variety of coluber berus: it is a native of Dauphiny, Lyons, and Poitiers. Cepede deſcribes a ſnake that inhabits the northern parts of France under the name of L'Aſpic, but which, according to Latreille, is not the true coluber aſpis of Linnæus, as its name may imply. This kind, Cepede informs us, is about three feet in length, of which the tail meaſures three inches and eight lines. The head is rather large, and covered with ſmall carinated ſcales, the body larger, of ſimilar ſtructure, the colour, pale rufous grey, and along the upper parts are three longitudinal ranges, of roundiſh dark rufous ſpots, bordered with black, and which unite or become confluent near the tail, and thus exhibits the appearance of a zig-zag band, ſimilar to that of the common viper. The underparts of this ſnake, are of a duſky colour, marbled with dull yellow; its fangs reſemble thoſe of the common viper, and it is reputed equally poiſonous with that ſpecies. We introduce this ſnake under the ſpecies aſpis, conceiving it may be hereafter aſcertained to be of the ſame individual ſpecies, although writers are not agreed on this point at preſent.

Ammodytes. Brown or pale blueiſh, with a dentated black dorſal band: noſe terminated by an erect wart. *Coluber ammodytes* abdominal ſcuta 142, ſubcaudal ſcales 32. Linn. Amoen. Ac. Weigel Abh. *Vipera illyrica*, Laur. Amph. *Driunus*, Bell. *Ammodytes*, Aldr.

Inhabits the Eaſt, and mountainous parts of Illyria. This ſpecies is greatly allied to the viper, from which it is diſtinguiſhed principally by the erect proceſs at the tip of the ſnout. The colour is uſually blueiſh grey or brown, with a continued black dorſal band, reſembling that of the viper. This is conſidered as an extremely poiſonous ſpecies, and according to Matthiolus, proves fatal in the ſpace of three hours. The fleſh is uſed medicinally for the ſame purpoſes, as that of the common viper.

Lachesis. Yellowiſh-grey, variegated with brown; a black tranſverſe band above the eyes.—*Cobra lacheſis*, Laur. Amph. *Serpens ceilonica*, Bitin. *Dicta*, Seba.

Deſcribed and figured by Seba, from whom it appears this ſpecies is a native of Ceylon, and is known by the name of bitin. Its colour is a rich and ſomewhat irregular variation of deep and light brown, diſpoſed in ſtreaks and patches, on a yellowiſh grey ground. The ſcales, which in many parts are tipped with white, are large, ſtrongly carinated, and fixed only at the baſe, while the remainder is looſe or free. This ſingular diſpoſition of the ſcales, affords the animal an opportunity of elevating or depreſſing them at pleaſure, and in moving, is ſaid to occaſion a kind of ruſtling noiſe.

This is a poiſonous ſpecies, being armed with large fangs, and from its general form, appears to be an animal of conſiderable ſtrength. The head is indiſtinct, or not diſtinguiſhed from the reſt, by any contraction, or appearance at the neck. The male is deeper coloured than the female, and ſeems to have the body larger, and the tail more ſlender. The general length of this ſnake, ſeems to be about four or five feet, and the tail ſhort in proportion to the body.

Clotho. Greyiſh-orange; variegated with numerous waved black bands; keel of the ſcales on the chin with a white ſpot; tail very ſlender.—*Cobra clotho*, Laur. Amph. *Vipera*, Bitin. *Ceilonica elegantiſſima*.

Inhabits Ceylon and Cuba, and is ſuppoſed to be a poiſonous ſpecies. This appears to be from the work of Seba to be a large ſnake, meaſuring more than ſix feet in length, and being thick in proportion ; the head large, covered with minute ſcales, and as in the coluber lacheſis, ſcarce diſtinguiſhed from the body, by any perceptible contraction at the neck. The colour of the upper parts, is greyiſh orange freckled with black ſpecks, and marked with tranſverſe undulated, or ſomewhat zig-zag bars of black. The under parts are cinereous, variegated with a few black bars, and tranſverſe ſtripes.

ATROPOS. Hoary, with a quadruple ſeries of large brown ocellar ſpots, with white margins. *Coluber atropos*, abdominal ſcuta 131, ſubcaudal ſquamæ 22. Linn. *Cobra atropos*, Laur.

The length of this ſpecies is about ſixteen inches ; the head large, marked with four or five duſky ſpots, and covered with ſmall ſcales : the body rather bulky : the tail is ſhort, meaſuring about a ninth part of the whole length. It is a native of America, and is conſidered as an extremely poiſonous animal.

TISIPHONE. Body thick, brown, and without variegations, *Coluber tiſiphone*. Shaw. Gen. Zool. *Black viper*, Cateſby.

This, according to Cateſby, is the ſize of the black American viper, meaſuring about two feet in length, and being large in proportion ; he tells us it is a ſluggiſh reptile, advancing deliberately even to eſcape danger, but will yet defend itſelf when attacked with much fierceneſs, and its bite is ſaid to be very venomous. It is found in Virginia, and Carolina, in the laſt of which it is called the truncheon ſnake. This ſpecies preys on lizards, and other animals.

MEGAERA. Brown, varied with yellow : head flat and heart-ſhaped, and a large orifice between the eyes and noſtrils on each ſide. *La Vipere Fer de-lance*, Cepede.

This is a large ſpecies meaſuring five or ſix feet in length. It inhabits the iſland of Martinico and ſome of the neighbouring iſlands, and is conſidered one of the moſt formidable of the ſerpent tribe. A ſpecimen of this ſnake, preſerved in the Britiſh Muſeum, is a rich deep brown, with yellow variegations, the back being marked throughout the whole length, by pretty numerous equidiſtant, broken, and ſlightly alternating bars of dull yellow, which, deſcending and joining at intervals with the neighbouring ones, form obſcurely annular and ſomewhat irregular markings of ſimilar colour along the ſides, with ſtill more obſcure croſſings on the part neareſt the ſcuta, intermixed with ſmaller patches and ſpots : the abdomen is dull yellow, clouded and ſpeckled on the ſides with pale brown. The head is large, flat, heart-ſhaped, and covered with very ſmall carinated ſcales ; but the terminal ſcale of the noſe, and thoſe at the ſides of the mouth, are very large, and above each eye is alſo a very large ſcale. The noſtrils are ſmall, and between them and the eyes on each ſide is a large orifice, which has been regarded as a paſſage to the organ of hearing ; the ſcales on the whole upper parts of the body are moderately large, ovate, and carinated, the back ſlightly elevated, the ſides rather ſloping, and the abdomen flattiſh.

The fangs of this ſerpent are of a large ſize, about three quarters of an inch in length, and curved. The poiſon is ſaid to reſemble that of moſt ſerpents, being a clear yellowiſh fluid, like olive oil. The ſymptoms are ſuch as follow from that of the viper, but in a much ſtronger degree. When preparing to bite, it is ſaid to throw itſelf into a ſpiral form, and to ſpring with great rapidity on its prey, but at other times to be rather ſlow in its motions, and of a torpid nature, concealing itſelf beneath the herbage, or within the hollows of trees. It frequents ſugar plantations, for the ſake of the rats, which abound in ſuch ſituations, and alſo preys on birds. The female goes ſix months with young, and produces the new brood perfectly formed, and amounting to forty, fifty, or even ſixty : they are obſerved to vary in colour when young, ſome being yellow, others grey, and others intermixed, yellow, grey, and brown.

COBELLA. Brown, lineated with white : head broad with a lead coloured ſtripe behind each eye. *Coluber cobella*, abdominal ſcuta 150, ſubcaudel ſcales 54. Linn. Amoen. Acad. *Coluber ater, lineolis albis*, Boddaert. *Ceraſtes cobella*, Laur. Amph.

Grows to the length of two feet nine inches, and varies much in the diſpoſition of its colours, and the number of its abdominal ſcuta, and ſubcaudel ſcales. Gmelin enumerates no leſs than fourteen variations of this kind. It is a very common ſnake in America.

COBRA. Entirely brown, compreſſed : back carinated, ſcales of the ridge largeſt ; head elongated and rounded. Gmel. Laur. Amph. Allied to the coluber redi.

CORONATUS. Deep black, with white unequal ſpots and dots. Gmel. *Ceraſtes coronatus*. Laur. Amph. Inhabits New Spain.

NOVÆ HISPANIÆ. Above black, beneath white ; back with oblique ſtreaks, poſterior parts with oblique bands. Gmel. *Ceraſtes mexicanus*, Laur. Amph.

Reſembles C. coronatus, and like that ſpecies, inhabits New Spain.

NATRIX. Brown, with a black and yellow patch on each ſide the neck, and a row of black ſpots down each ſide ; abdomen duſky. *Coluber natrix*, abdominal ſcuta 170, ſubcaudal ſcales 60. Linn. Fn. Suec. *Natrix vulgaris*, Laur. Amph. *Natrix torquata*, Raj. *Gemeine ſchlange*, Meyer. Thiere. *Common ringed ſnake*, Penn.

Inhabits moſt parts of Europe, where it frequents woods, moiſt hedges, and ſhady places. Many varieties of this ſnake are deſcribed by writers, but the colour is in general either a blueiſh grey, or pale olive above, the ſides variegated with black, and the under parts a mixture of black and white. The head is rather ſmall comparatively, and is covered with large ſcaly plates ; the tail is of moderate length, and gradually tapers to the extremity.

This ſnake preys on frogs, mice, and ſmall birds, inſects, and worms, and occaſionally frequents the water in ſearch of the firſt ; it is capable of ſwimming, but not well. It depoſits its eggs in any warm and moiſt ſituation in the form of a continued chain or necklace of ova, to the number of twelve, fourteen, ſixteen, or even twenty, of the ſize of thoſe of a blackbird, and of a whitiſh colour, and it appears are hatched in the ſpring following. During the winter the ſnake conceals itſelf and becomes nearly torpid, and re-appears in the ſpring, at which ſeaſon it is ſaid to caſt its ſkin ; we ſuſpect that it caſts its ſkin twice every year. This is not a poiſonous ſpecies.

ATROVIRENS. Black green ſpeckled with yellow ; abdomen yellow, with a row of black ſpecks down each ſide. *Anguis æſculapii niger*, Aldr. Serp. *La coleuvre verte et jaune*, La Cepede.

A ſpecies oftentimes confounded with the preceding : it is deſcribed with accuracy by La Cepede, who informs us it is frequent in ſome provinces in France. Its haunts are woods, and moiſt ſhady places ; in ſize and general appearance it reſembles the ringed ſnake, coluber natrix, but differs in colour, being of an extremely dark or blackiſh green, appearing at the firſt view entirely black : the ſides are marked with numerous rays of yellow ſpecks, of different forms, ſome oblong, and ſome ſquare ; the eyes and edges of the mouth are bordered with yellow ſcales ; the abdomen is alſo yellow, every plate being marked on each ſide with a black ſpeck. This ſnake is perfectly harmleſs. La Cepede relates from M. Bromare an anecdote relative to a ſnake, which he ſuppoſes to have been of this ſpecies, and which had been ſo completely tamed by a lady as to come to her whenever ſhe called it; follow her in her walks, wreath itſelf round her arms, and ſleep in her boſom. One day, when this lady went in a boat to ſome diſtance up a large river, ſhe threw the ſmake into the water; imagining that it would readily recover the boat by ſwimming; but the current proving unuſually ſtrong at that juncture owing to the advance of the tide, the poor animal in ſpite of all his efforts to reach the veſſel was unfortunately drowned.

GRONOVIANUS. Blueiſh-aſh, beneath blackiſh; a white arched ſpot each ſide the hind head, and one black: back-waved with black. Gmel. Laur. Amph.

Bears a near affinity to the preceding, and is perhaps a variety only of the former, coluber natrix. Number of plates and ſcales not aſcertained.

HUMANUS. Black ſpotted with white; tail alternately ſtriped with black and white. *Coluber humanus*, Gmel. *Natrix humana*, Laur. Amph.

A ſnake very commonly domeſticated in New Spain; and alſo ſaid to inhabit Amboyna.

PUNCTULATUS. Fuſcous, with very minute ſpots of white. Gmel. *Natrix punctata*, Laur. Amph. Native country unknown.

TYROLENSIS. Abdominal ſcuta 178, ſubcaudal ſcales 60. Gmel.

Deſcribed after Scopoli, who informs us it inhabits the Tyroleſe country and depoſits its eggs among ſtones, theſe are white and leathery, with a lateral yolk and turbid watery white, and are found ſticking together in cluſters of about fourteen in number.

BIPES. Abdominal ſcuta 116, ſubcaudal ſcales 58. Gmel. Scop. ann. hiſt.

Mentioned by Scopoli as an inhabitant of the Tyroleſe waters. This kind preys on fiſh and frogs; and is ſaid to be furniſhed with two ſhort proceſſes or feet; the eyes are red or tawny, lower jaw whitiſh, dorſal ſcales elliptic and marginate; ſides ſpotted with white: plates of the belly whitiſh, with a brown ſpot in the middle.

AUSTRIACUS. Blueiſh-grey, with a double dorſal row of rufous ſpots, and reddiſh ſides and abdomen. *Coronella auſtriaca*, Laurenti. *La Liſſe*, Cepede.

This bears a general reſemblance to the common ſnake, coluber natrix, and ſeems to have been firſt deſcribed by Laurenti, who ſpeaks of its being common round Vienna: it occurs alſo in France, and ſeveral other parts of Europe. The principal diſtinction between this ſpecies and the coluber natrix conſiſts in the perfect ſmoothneſs of its ſcales, thoſe of the natrix being ſomewhat carinated. This animal inhabits moiſt meadows, hedges, and ſwampy places, and bites with much eagerneſs, but is incapable of doing any injury, as nature has not provided it with poiſonous fangs. It is ſaid to be eaſily tamed, in which ſtate it ſhows a conſiderable degree of attachment.

ÆSCULAPII. Whitiſh, with double black tranſverſe zones; abdomen whitiſh, variegated with black. *Coluber æſculapii*, abdominal ſcuta 180. ſubcaudal ſcales 43. Linn. *Natrix æſculapii*, Laur. *Coluber albus annulis nigris*, Boddaert.

Length from eighteen inches to two feet; the colour pale whitiſh with a more obſcure caſt on the back, and is marked throughout with nearly equidiſtant black bands, each ſurrounding the body, and divided half way up from the abdomen by a line or narrow ſtripe of the ground colour; thus giving a bifid appearance to the lower part of each band. The head is covered with large ſcales, and marked on the fore part by a tranſverſe black bar running acroſs the eyes. This is a native of South America, and is ſaid alſo to inhabit ſome parts of Aſia.

NAJA. Yellowiſh brown; on the back of the neck a large ſpectacle ſhaped ſpot. *Coluber naja*, plates of the belly 193; ſcales of the tail 10. Linn. *Naja luteſcens*, Laur. Amph. p. 91. *Serpens Malabarica cobra de capello dicta.* Seb. *Spectacle ſnake, nagoo*, Ruſſell. Ind. Serp. Shaw Gen. Zool.

The coluber naja is a native of India and the Ternaet iſlands, where it appears to be one of the moſt common, as well as moſt noxious, of the ſerpent tribe; very frequently proving fatal in the ſpace of a few minutes to thoſe who unfortunately experience its bite. The form of this ſpecies is very remarkable: its general length ſeems to be three or four feet, and the diameter of the body about an inch and a quarter. The head is comparatively rather ſmall, and is covered on the fore part with large ſmooth ſcales, as in the greater number of innoxious ſerpents; the ſcales on the back part and ſides of the head, and alſo on the neck are ſmaller and ovate: thoſe on the remainder of the animal, on the upper part oblong oval, not ill reſembling the general form of a grain of rice. At a ſmall diſtance beyond the head is a lateral ſwelling or dilation of the ſkin, which is continued to the diſtance of about four inches downwards, where the outline gradually ſinks into the cylindrical form of the reſt of the body. This part is extenſile at the pleaſure of the animal; and when viewed from above, while in its moſt extended ſtate, is of a ſomewhat cordated form, or wider at the upper than the lower part, and is marked with a ſingular ſpectacle-formed ſpot of black and white, the mark itſelf being white, and the edges black, and the middle of each of the rounded parts black. This mark is more or leſs diſtinct in different individuals, and alſo varies occaſionally in ſize and form, or in ſome inſtances is altogether wanting. The uſual colour of the animal is a pale ferruginous brown above; the under parts blueiſh-white, ſometimes ſlightly tinged with pale brown, or yellow; the tail, which is of a moderate length, tapers gradually and terminates in a ſlender, ſharp pointed extremity. The title of *cobra de capello*, or hooded ſnake, has been given to this formidable reptile by the Portugueſe, from the appearance which it preſents when viewed in front in an irritated ſtate, or when preparing to bite, at which time it bends the head rather downwards, and ſeems hooded, as it were, in ſome degree by the expanded ſkin of the neck.

Laurenti enumerates four varieties of this hooded ſnake, *Naja luteſcens*, the common kind; β *Naja faſciata faſciis per totum corpus ex fuſco rubris*, having fuſcous red bands over the whole body γ *Naja ſiamenſis, ex cinereo griſea, ſummo dorſo rufo.* Cinereous, with the back rufous; and δ *Naja maculata, ex luteo rufa, ſquamis ſingulis alba macula notatis*; of a tawny yellow colour, and having every ſcale marked with a ſingle white ſpot. But it appears from the work of Dr. Ruſſell "On the Serpents of India," that there are many other varieties of this extraordinary ſnake. He deſcribes no leſs than ten different kinds that are found in India alone, and ſeems to intimate that thoſe are not the whole of the Nagoo tribe which infeſt that part of the world. It is poſſible, on further inveſtigation, ſome of thoſe deſcribed by Dr. Ruſſell as varieties may prove to be ſpecifically diſtinct: according to the character laid down by Linnæus, taken from the number of the abdominal plates and ſcales on the belly, they are clearly ſo; but it is not on this criterion, the fallacy of which is too apparent, that we hazard an opinion; we allude to the different conformation of the ſpectacle-like mark on the back of the neck, and ſtill more to the diſſimilarity obſervable in the figure of the ſcutæ and laminæ; the variations in colour are but ſecondary particulars in conſideration. Dr. Ruſſell enumerates the varieties above-mentioned in the following order.

1. *Arege nagoo.* With a pale central ſpot in the middle of each of the black ſpots of the ſpectacle-ſhaped mark. Abdominal ſcuta 189, ſubcaudal ſcales 60.

2. *Coodum nagoo.* This variety is darker than the other; and the ſkin is of a yellower caſt; but the principal diſtinction is in the ſpectacle-mark, which conſiſts of an oblong curved frame without the uſual black eyes or centre-ſpots of the others. Abdominal ſcuta 187, ſubcaudal ſcales 57.

3. *Sankoo nagoo.* The chief diſtinction of this is a plain hood, without any mark. This variety is ſuppoſed by Seba to be the female of the ſpecies; but Dr. Ruſſell informs us that one which he brought home from India, and preſented to Mr. John Hunter was a male, and that the uſual ſpectacle-ſhaped mark is found indifferently both on the males and females. This variety is more rare than the reſt. Abdominal ſcuta 183, ſubcaudal ſcales 56.

4. *Mogla nagoo.* The cervical ſcuta in this variety are ſpotted here and there with faint greyiſh ſpots, and four of the middle ones are entirely of a blueiſh-grey. Abdominal ſcuta 192, ſubcaudal ſcales 65.

5. *Malle nagoo.* The colour of this variety is of a lighter brown than the reſt, and the ſcuta whiter; and leſs ſpotted, but ſeven of the pectoral ones are completely dark. Abdominal ſcuta 191, ſubcaudal ſcales 62.

6. *Cumbo nagoo.* In this ſome deviations were obſervable in the laminæ: all the cervical ſcuta were duſky, and the trunk had a ſtrong blueiſh caſt. Abdominal ſcuta 186, ſubcaudal ſquamæ 60.

7. *Jenna nagoo.* The ſkin of the hood in this is tinged with orange colour; the ſcuta of the neck ſpotted with grey, and ſix of the lower ones wholly of a blue grey. Abdominal ſcuta 189, ſubcaudal ſquamæ 57.

8. *Nella tas pam.* With the black on the hood unuſually deep, and all the jugular ſcuta remarkably duſky. Abdominal ſcuta 186, ſubcaudal ſquamæ 62.

9. *Kiſtna nagoo.* The middle lamina of the three between the eyes remarkably broad, and the poſterior part ſubovate inſtead of ſemi-cordate; five of the jugular ſcuta duſky, and ſix of the pectoral almoſt black. Abdominal ſcuta 186, ſubcaudal ſquamæ 63.

10. *Korie nagoo.* The three laminæ between the eyes remarkably narrow; the large poſterior pair oval; colour of the trunk, and ſtill more of the ſcuta unuſually blueiſh. Abdominal ſcuta 184, ſubcaudal ſquamæ 57.

The cobra de capello, it is obſerved, is every where exhibited publicly as a ſhow in India; and is of courſe more univerſally known in that country than almoſt any other race of reptiles. It is carried about in a covered baſket, and ſo managed by its proprietors as to aſſume, when exhibited, a kind of dancing motion; raiſing itſelf upon its lower part, and alternately moving its head and body from ſide to ſide for ſome minutes, to the ſound of ſome muſical inſtrument which is played during the time. The Indian jugglers, who thus exhibit the animal, firſt deprive it of its fangs, which renders it incapable of inflicting a poiſonous wound by means of its bite.

Dr. Ruſſell, in his account of various experiments made in India with this ſerpent, aſſures us that as a general ſtandard for a compariſon of the effects of its bite with that of other poiſonous ſerpents, he never knew it prove mortal to a dog in leſs than 27 minutes, and to a chicken in leſs than half a minute. Thus fatal as it is, its poiſon ſeems not ſo ſpeedy in operation as that of the rattle-ſnake, which has been known to kill a dog in the ſpace of two minutes. The following intereſting experiments are related by Dr. Ruſſell to confirm the accuracy of this obſervation.

In the month of June 1787, a dog bitten by a Cobra de capello on the inſide of the thigh, howled at firſt, as if in ſevere pain; after two or three minutes he lay down, continuing to howl and moan; after twenty minutes he roſe, but with much difficulty, being unable to walk, and his whole frame appeared greatly diſordered. He ſoon lay down again, and in a few minutes was ſeized with convulſions, in which he expired twenty-ſeven minutes after. This is the only inſtance mentioned in which the poiſonous bite of the Cobra de capello proved fatal to dogs in much leſs than the ſpace of an hour.—A large and very ſtout dog was bitten by another Cobra de capello on the inſide of the thigh, which in a minute or two was drawn up, the firſt ſymptom in general of the poiſon having taken effect. He continued, however, nearly half an hour longer walking on the three remaining legs, ſeeming not otherwiſe diſordered; but after this time, he laid himſelf along in great inquietude, his head and throat being convulſed in an uncommon degree; he made ſeveral vain efforts to riſe, his legs became both paralytic, and after continuing in this ſtate for an hour, he expired.—A large dog was bitten by a Cobra de capello which had been captive only two days. He complained a good deal at the inſtant of the bite, and the leg was ſoon drawn up. In twenty-five minutes he was ſeized with convulſions, ſucceeded by ſtupor, in which ſtate he lay for ten minutes; the convulſions, however, returned, and he expired in a quarter of an hour, being fifty-ſix minutes after the bite. This experiment was tried on the 11th of November.

Auguſt 9th, a Cobra de capello, which had loſt two of his longeſt fangs, but retained two of the ſecond order, was made to bite a very large ſtout dog. At firſt the dog complained loudly, though without drawing up the thigh, or ſhewing any other ſymptom of poiſon; but happening at this time to break looſe, he was purſued, and brought back, after a chace of an hour and a half, much fatigued and heated. After reſting a quarter of an hour, water was offered to him, which he refuſed, though he eat ſome morſels of bread thrown into it. About a quarter of an hour afterwards he became much diſturbed, grew entirely outrageous, howling violently, ſnapping at and gnawing the ſtake to which he was tied with incredible ferocity. This continued about three hours, when growing faint, his howlings grew weaker, his convulſions increaſed, and he expired about four hours after the bite.—A pig bitten by a ſnake of this kind, which had been fed only once in ſeven days with milk, became greatly diſordered in twenty minutes, and expired in leſs than an hour.—A chicken has been ſometimes known to ſurvive two hours after being bitten by a Cobra de capello. Chickens and pigeons bitten by a Cobra de capello, whoſe fangs had been eradicated, ſuffered no ſymptoms of poiſon; but when poiſon taken from the ſame ſnake was inſerted into their bodies, either by inciſion or puncture, they ſuffered the uſual ſymptoms, and very often died.

It was endeavoured alſo to aſcertain the effects of the bite of the Cobra de capello upon reptiles of the ſame ſpecies, the reſult of which appears doubtful. In ſome inſtances, the bitten animal experienced no kind of injury, while to others the bite proved fatal. An attempt was made, on the 17th of Auguſt 1788, to make a Cobra de capello bite another (of the variety called *Nooni paragoodo*) in the tail, but that part being found too ſmall, the belly was bitten, a little above the vent. The bitten ſnake ſoon loſt its former activity, and when put under a glaſs coiled itſelf up. In this ſtate it was left, and after an hour and a quarter was found dead. On opening the belly, the parts immediately beneath the bite appeared much inflamed, though it could not be diſcovered whether any fangs had penetrated into the cavity.

A Cobra de capello, received by Dr. Ruſſell from Ganjam, under the name of *Saltanag*, was made to bite another remarkably large Cobra brought from the ſame place, under the name of *Coultiah*. The poiſon was ſhed on the place, but no marks of fangs could be perceived, and the Coultiah remained as well as before: this experiment was repeated with the ſame reſult, though a little blood as well as poiſon was found on the part bitten. Some days after this, a Cobra de capello (of the variety called *Coodum nagoo*) was made to bite the Coultiah on the belly; both fangs viſibly acted; blood appeared on the wound, but no other conſequence followed. A *Tar tutta* ſnake, bitten immediately after, in the ſame manner, died within two hours.

RUFUS. Rufous, with diſtant reddiſh-fuſcous bands; ſpectacle-ſpot ſomewhat heart-ſhaped, and marked with four black ſpots. Seba. *Naja braſilienſis*, Laurenti. La Cepede, &c.

Deſcribed by Seba and others after him as a native of Braſil. This is perhaps a variety of the preceding.

BUCEPHALUS. Brown, with tranſverſe whitiſh bars; head large, cordated, and depreſſed; body compreſſed; tail very ſlender. *Serpens luſitanis cobra de capello dicta*, Seba. *Coluber bucephalus. bull-headed ſnake*, Shaw Gen. Zool.

According to Seba, this ſpecies is a native of Ceylon; he conſiders it as a kind of Cobra de capello, or hooded ſnake, in which reſpect he is miſtaken. The length of this ſnake is between four and five feet; the head is extremely large, depreſſed, cordated behind, ſomewhat compreſſed at the ſides of the mouth, and covered above by very large ſcaly plates. At ſome diſtance from the eyes are two remarkable, oblong, brown ſpots. The neck is thin, and, together with the whole body, extremely compreſſed on the ſides; tail long, round, and tapering to a fine point. From the head, along the back, runs a row of large, broad, hexagonal ſcales, thoſe on the other parts are ovate; the abdominal plates are very narrow. The general colour of the animal is rufous-brown, with moderately diſtant, broadiſh, tranſverſe, pale bands, each of which, at its juncture with the ſcuta, is marked with a white ſpot.

RUSSELLI. Browniſh-yellow, with acutely-ovate, blackiſh, dorſal ſpots, edged with white; lateral ſpots ſmaller and ovate. *Ratuka rekula poda*, Ruſſ. Ind. Serp. *Ruſſelian ſnake*, Shaw Gen. Zool.

The abdominal plates, according to Dr. Ruſſell, amount, in this ſpecies, to 168, and the ſcales under the tail to 59. The length of this ſnake is about four feet. Its colour an elegant pale yellowiſh-brown, marked throughout the whole length of the back with a continued ſeries of large ovate ſpots of a deep brown colour, paleſt in the centre, and ſurrounded by a narrow line of white. In ſome parts thoſe ſpots are nearly confluent; on each ſide of the body is a row of brown oval ſpots, ſmaller than thoſe on the back; and beſides theſe, a few ſtill ſmaller tranſverſe marks are ſparingly ſcattered on the ſides; the under part of the body is white, with a few duſky ſpots; the head is rather large, the ſnout obtuſe, the mouth wide, the fangs large, and, as in ſeveral other poiſonous ſerpents, double, a ſmaller fang being ſituated cloſe to the larger one on each ſide.

Dr. Ruſſell informs us, this ſpecies is ſcarce leſs common in India than the Cobra de capello; but from its not being carried about, like that and ſome other ſnakes, as a public ſhow, is not ſo univerſally known either among the natives or Europeans.

Several experiments were made by Dr. Ruſſell to determine the effects of its bite, from which it appears to be one of the moſt poiſonous of its tribe. A chicken bitten in the pinion by one of theſe ſnakes, which had been caught two or three days before, and ſeemed in high ſpirits, was inſtantly infected, ſeized with convulſions, and expired in thirty-eight ſeconds. Immediately after the chicken, a ſtout dog was bitten in the thigh; within leſs than five minutes he appeared ſtupefied; the thigh was drawn up, and he frequently moved as if in pain. He remained, however, ſtanding, and eat ſome bread that was offered to him. In about ten minutes the thigh became paralytic; in fifteen minutes he entirely loſt the uſe of the wounded thigh, and lay down, howling in a diſmal manner, frequently licking the wound, and making, at intervals, ineffectual attempts to riſe. In nineteen minutes, after a ſhort ceſſation, he again began to howl, moaned often, his breathing became laborious, and the jaws were completely ſhut. The few ſucceeding minutes were paſſed alternately in agony and ſtupor, and in twenty-ſix minutes after the bite he expired. A ſecond dog, of much ſmaller ſize, was next bitten, and expired in the ſpace of ſix hours. After this, a rabbit was expoſed to the bite of the ſnake, and died in leſs than an hour; and, laſtly, a chicken bitten in the pinion expired in leſs than ſix minutes. The whole of the above experiments were made with the ſame ſnake in the courſe of the ſame morning.

GRAMINEUS. Green, beneath yellowiſh, with the edges of the abdomen ſpotted with green. *Boodro pam*, Ruſſell Ind. Serp. *Graſs-green ſnake*, Shaw Gen. Zool.

The length of this kind is about thirty inches. The head is rather large in proportion, and obtuſely tapering, but not pointed, and is covered entirely with very ſmall ſcales; the colour is as above deſcribed. This is a native of India, and was firſt deſcribed by Dr. Ruſſell; it is of the poiſonous kinds, and has the fangs remarkably long and ſlender. From the experiments of the laſt-mentioned writer it appears, that a chicken died, after having ſuffered ſtrong convulſions, and afterwards ſtupor, in about eight minutes from the bite; pigs and dogs were ſeized with a ſtupor, convulſions, &c. but in a few hours recovered from the effect of the poiſon.

CROTALINUS. Cinereous, marked above with large alternate blackiſh ſpots; beneath yellow, freckled with brown. *Coluber crotalinus*, abdominal ſcuta 154, ſubcaudal ſcales 43. Linn.

A large ſpecies, with the habit of the rattle-ſnake; the head is heart-ſhaped, the eye-lids protuberant, ſcales carinated. Native country unknown.

SEVERUS. Cinereous, with oblique linear whitiſh bands, edged with brown. *Coluber ſeverus*, abdominal ſcuta 170, ſubcaudal ſcales 42. Linn.

Length about ſeventeen inches; thickneſs moderate; head broad, obtuſe, livid, with cinereous band between the eyes, and behind the noſe; eyes large; neck thick; the colour of the upper parts as before deſcribed; the abdomen duſky; ſides ſpeckled with white; tail ſhort. The figure in Seba, quoted by Linnæus, is of a pale rufous colour, with yellowiſh bands, ſomewhat reſembling Hebrew characters in form, and edged with brown; the abdomen pale yellow, with a row of blackiſh ſpots on each ſide.

PORPHYRIACUS. Violet-black, with the abdomen and ſides crimſon, the ſcuta margined with black. Zool. New Holl. p. 27. pl. 10. Abdominal ſcuta 188, anal ſcuta 7, ſubcaudal ſquamæ 45.

Firſt deſcribed by Dr. Shaw, who ſpeaks of it as a moderately large and beautiful ſpecies; the general proportions nearly the ſame with thoſe of Coluber natrix, the common Engliſh ſnake. The head is rather ſmall, and covered in front with large ſcales; the colour of the head and whole under-parts very fine deep violet; ſides and abdomen crimſon, deepeſt on the fore-part, the large ſcales near the ſcuta being carmine-coloured, with black tips; the abdomen roſe-coloured, with a tinge of yellow, each ſcutum deeply edged with black, thus forming a beautiful ſeries of tranſverſe black bars down the abdomen. The tail meaſures about a ſixth part of the whole length, and is furniſhed beneath, excluſive of the divided ſubcaudal ſcales, with about ſeven ſcuta, or undivided laminæ, commencing immediately beyond the vent, which is edged with ſimilar ſmaller ſquamæ; the colour of the under parts of the tail is a blueiſh-aſh, the roſe-colour of the abdomen ceaſing at the commencement of the tail. In the Zoology of New Holland, Dr. Shaw deſcribes this ſpecies as deſtitute of fangs, and conſequently innoxious; an error ariſing from the mutilated ſtate of the ſpecimen he examined. The ſnake has been ſince obſerved to be furniſhed with thoſe organs; and, as Dr. Shaw remarks, in his General Zoology, to be highly dreaded by the natives of Auſtralaſia, as a poiſonous ſpecies.

Hæmachates. Red, clouded with white; abdomen yellowiſh-white. *Serpens aſiatica hæmachates dicta*, Seba. *L'hæmachate*, Cepede.

Seba deſcribes this ſnake as a native of the Eaſt Indies, having received it from Perſia and Japan. Its general length is about two feet or more; its colour red, varying to deeper or paler in different individuals, and ſometimes inclining to brown; the variegations white or whitiſh. The head is moderately large, and covered in front with large ſcales; tail extremely ſhort and tapering to a point. La Cepede conſiders it a poiſonous ſnake.

Aquaticus. Brown, with the abdomen banded with black and yellow. *Water viper*, Cateſby.

We are acquainted with this ſpecies only from the account given of it by Cateſby. "This ſerpent (ſays that writer) is called in Carolina the water rattle-ſnake; not that it hath a rattle, but is a large ſnake, and coloured not much unlike the rattle-ſnake, and the bite ſaid to be as mortal. This ſnake frequents the water, and is never ſeen at any great diſtance from it. The back and head are brown, the belly tranſverſely marked with black and yellow alternately, as are the ſides of the neck; the neck is ſmall; the head large, and armed with the like deſtructive weapons as the rattle-ſnake; it is very nimble, and particularly dextrous in catching fiſh. In ſummer great numbers are ſeen lying on the branches of trees hanging over rivers, from which, at the approach of a boat, they drop down into the water, and often into the boat on the men's heads. They lie in this manner to ſurpriſe either birds or fiſh, after which laſt they plunge, and purſue them with great ſwiftneſs, and catch ſome of a large ſize, which they carry on ſhore and ſwallow whole. One of theſe I ſurpriſed ſwimming aſhore with a large cat-fiſh in his mouth. The tail is ſmall towards the end, and terminates in a blunt horny point, about half an inch in length, and which, though harmleſs, is conſidered as of dreadful efficacy, by the credulous vulgar, who believe that the animal is able, with this weapon, not only to kill men and other animals, but even to deſtroy a tree by wounding it with it, the tree withering, turning black, and dying."

Lacteus. Milky-white, the back marked by double black ſpots; head black, with a longitudinal white line. *Coluber lacteus*, abdominal ſcuta 203, ſubcaudal ſcales 32. Linn.

Length eighteen inches. A native of India and South America, and is reputed poiſonous.

Niveus. Snowy-white, without variegations. *Coluber niveus*, abdominal ſcuta 209, ſubcaudal ſcales 62. Linn. Inhabits Africa.

Melanis. Deep black; ſides clouded with blueiſh, the eyes brown, with the edge of the pupil ſilvery. *Coluber melanis*, abdominal ſcuta 148, ſubcaudal ſcales 27. Gmel. Pallas It.

Obſerved by Dr. Pallas on the borders of the Volga and Samara rivers in Siberia. It has the general appearance of the viper, but differs in colour, being of a deep black on the back, and of a ſteely luſtre beneath, marked with patches of a deeper caſt, while the ſides are clouded, and ſpotted at intervals with blueiſh. The eyes are of a bright white, with perpendicular pupils, and ferruginous irides; tail ſhort, and gradually tapering to the tip.

Buccatus. Whitiſh, with large double brown dorſal ſpots; head ſomewhat depreſſed, cheeks timid. *Coluber buccatus*, abdominal ſcuta 107, ſubcaudal ſcales 72. Linn.

A poiſonous ſpecies; it inhabits South America and India. Length twelve inches.

Atrox. Grey brown, with tranſverſe linear whitiſh ſtripes; abdomen duſky with white tranſverſe variegations. *Coluber atrox*, abdominal ſcuta 196, ſubcaudal ſcales 69. Linn.

Length about eighteen inches; it is a poiſonous ſnake, and is a native of the iſland of Ceylon.

Corallinus. Glaucous, with ſcales ſomewhat heart-ſhaped, and three brown lines down the back. *Coluber corallinus*, abdominal ſcuta 193, ſubcaudal ſcales 82. Linn.

Linnæus deſcribes this as a poiſonous ſpecies: it is a native of the eaſtern regions; it preys on lizards.

Leberis. Pale; head white; body marked above with linear black bands. *Coluber leberis*, abdominal ſcuta 110, ſubcaudal ſcales 50. Linn.

Deſcribed by Kalm, who informs us that it is a native of Canada, and that the upper parts are traverſed by linear black bands; the head white with two rufous ſpots on the top, and a triangular ſpot over the noſe. Linnæus mentions it as a poiſonous ſpecies, a particular conſidered doubtful by Dr. Gray.

Aulicus. Grey brown, with tranſverſe white bands bifurcating over the ſides. *Coluber aulicus*, abdominal ſcuta 184, ſubcaudal ſcales 60. Linn.

The length of this ſpecies is ſix inches; it inhabits America, and is one of the poiſonous kind of ſnakes.

Elegantissimus. White; head variegated with black; body marked above by a quintuple ſeries of ocellated red ſpots. *Coluber elegantiſſimus*, Gmel. Laur. Amph. *Serpens lemniſcata venuſtiſſima Americana*, Seba.

This is a beautiful ſpecies, meaſuring in length about two feet; the colour is white, marked down the upper part with a quintuple ſeries of black ſpots with red centres; the middle row is compoſed of very ſmall ſpots, the next on each ſide with larger ocellated ones, and the loweſt on each ſide, next the ſcuta, reſembling that on the middle of the back, and conſiſting of ſmall ſpecks; the head is marked by a croſs-ſhaped ſpot on the top, and by a few blackiſh ones acroſs the ſnout; the tail is ſhort, meaſuring two inches and a half in length, and tapering to a point.

Rhombeatus. Glaucous, with blackiſh lozenge-ſhaped ſpots, blue in the middle. *Coluber rhombeatus*, abdominal ſcuta 157, ſubcaudal ſcales 70. Linn.

Length from two to three feet; colour, in general, grey, ſometimes browniſh, with three alternating rows of ovate duſky ſpots, with large blue centres; the abdomen is pale or whitiſh, and often clouded with blueiſh grey. This is a native of India and South America.

Javanicus. Grey; head ſtriped with blue; body marked with tranſverſe blue ſtripes edged with golden.

Deſcribed by Mr. Wurmb in the "Memoirs of the Batavian Society," for the year 1787. This is a large and moſt beautiful ſpecies, and is ſeen principally in the rice fields, whence it obtains the name of *Oular-Sawa*, or Rice-field Snake. Thoſe which are found in the higher and more wooded ſituations arrive at a far ſuperior ſize. The head of this ſnake is large and flat, and is covered, as in the major part of the coluber genus, with large ſcaly plates; the mouth is furniſhed with double rows of ſharp teeth, but is deſtitute of fangs, the animal not being of a poiſonous nature; the iris is yellow; upper part of the head grey, mixed with blue; from behind the eyes paſs two blue ſtripes to the upper part of the neck, where they unite into an arch about an inch beyond the head; a third ſtripe of the ſame colour proceeds from the ſnout to the occiput, where it divides into two, and ſurrounds a yellow ſpot marked with a few blue ſpecks; the upper part of the body is divided into a kind of lattice-work, formed by ſtripes of bright blue with gold-coloured edges; the middle parts of the ſquare being of a grey colour, with changeable reflections of yellow, blue, and green; towards the ſides the grey colour is of a lighter or paler caſt, as well as on the tail, where the ſquares are ſmaller than on the back; each ſide of the body is alſo marked by a row of white ſpots, ſituated at the croſſings of the blue ſtripes. This ſnake preys on birds, rats, and various other ſmall animals.

Boæformis. Whitiſh, with brown variegations; white beneath, with very ſhort ſcuta. *Pedda poda*, Ruſſell Ind. Serp. *Boaform ſnake*, Shaw Gen. Zool.

A new ſpecies deſcribed by Dr. Ruſſell. The length of the ſpecimen, examined by that writer, was about two feet and a half; but it is ſuppoſed to attain to a much larger ſize. It was ſhort and thick with moderately large oblong-ovate head, covered with large ſcales; and the tail ſhort and ſharp pointed. The colour of the upper parts very pale or whitiſh brown, variegated on the back and ſides, with large and ſmall irregularly formed, deep-brown patches, and ſpots, thoſe on the ſides being moſtly ocellated. The body is covered with very ſmall ſcales, the three rows next the abdomen being much larger than the reſt; abdomen white, the ſcuta being remarkably narrow or ſhort, and reddiſh at the margins. The under part of the tail is variegated with black and white.

This is a native of India, and is repreſented as an animal of great ſtrength, wreathing round the arm, if held for a ſhort time, ſo cloſely as to numb the hand; it is not poiſonous, its bite producing no other effect than that of temporary pain.

The ſerpent mentioned by Dr. Ruſſell, under the name of *Bora*, is conſidered as a variety of coluber boæformis, and ſo alſo is the *Pedda poda*, t. 23, 24. The firſt is much larger than the ſerpent above deſcribed; the diſpoſition of the ſcales and colours are the ſame, but the ground colour is white, and the tail is furniſhed beneath with ſeveral undivided lamellæ towards the tip, or after thoſe immediately ſucceeding the vent, while the tip itſelf is again terminated by a few divided ſcales. This ſnake is found at Calcutta, where it is pretended the bite is very ſoon followed by eruptions on different parts of the body, though it does not prove fatal in leſs than ten or twelve days, but the whole of this is regarded as a mere popular error. The other ſuppoſed variety, the pedda poda, grows to a very large ſize, having been ſeen nine or ten feet in length. In its general appearance it reſembles that firſt deſcribed, but the ſcales are larger in proportion.

Melanurus. Yellowiſh brown, with black head, and two black ſpots on the tail. Ruſſell. Ind. Serp.

A ſmall ſpecies about ten or eleven inches in length, ſcarcely of the thickneſs of a gooſe quill, and nearly of equal diameter from the head to the tip of the tail. The colour is a light yellowiſh brown, with a dotted black line running from head to tail along the middle of the back, and a few fainter fillets on the ſides; the head is ſmall, ovate, black, and covered with large ſcales; the tail ſhort, ſcarcely meaſuring more than an inch in length, and is marked at its origin on the upper part, by a large rhomboidal black ſpot edged with white; and having a white ſpeck in the middle; the tip of the tail is alſo marked by a ſimilar black ſpot; the abdomen is of a pale orange colour, and the under part of the tail white, ſpeckled, and variegated with black. The bite of this ſpecies is ſaid to be painful but not poiſonous. It is a native of India, and is deſcribed among the ſerpents of that country by Dr. Ruſſell.

Jara. Black, with double linear white ſpecks, and yellowiſh collar and abdomen. *Jara potoo*, Ruſſell, Ind. Serp.

This is one of the new ſpecies of ſerpents deſcribed by Dr. Ruſſell. It inhabits India. The length is fifteen inches; tail very ſhort and tapering ſuddenly to a point. The abdominal ſcuta are 175 in number, and the ſubcaudal ſcales 56.

Arnensis. Yellowiſh-brown with narrow blackiſh tranſverſe bands edged with white, and pale abdomen. *Arnee ſnake*, Ruſſ. Ind. Serp.

Inhabits the country of Arnee in the Eaſt Indies. The length is about eighteen inches; the colour above yellowiſh, with moderately diſtant blackiſh, or very deep brown, tranſverſe bands which are whitiſh at the margins; the head is ſmall; tail rather ſhort and tapering to a ſharp-pointed tip. Abdominal ſcuta 169, ſubcaudal ſcales 50.

Sagittatus. Brown, with whitiſh ſagittated dorſal ſpots edged with black. *Tar tutta*, Ruſſ. Ind. Serp.

The length of this ſnake is two feet; the head is rather large in proportion, round, obtuſe, and covered with large ſcales; neck and body ſlender, the colour on the upper parts yellowiſh brown variegated, with a chain or ſeries of ſomewhat triangular, or ſagittated ſpots: the abdomen is yellowiſh white, and the ſcuta is marked by a duſky ſpot on each ſide. This is a native of India.

Striatus. Greeniſh black, with ſpotted white bands, and blueiſh-white abdomen. *Gajoo tutta*, Ruſſ. Ind. Serp.

This is much ſmaller than the laſt, meaſuring only fourteen inches: the colour above is greeniſh black, marked with about twenty tranſverſe bands, each compoſed of a number of longitudinal abrupt white or yellowiſh white ſtreaks, and along the ſides of the body are interrupted rows of ſimilar ſtreaks; the head is obtuſe, and covered with large ſcales, the abdomen blueiſh-white. Abdominal ſcuta 174, ſubcaudal ſcales 40.

Fasciolatus. Cinereous, with whitiſh tranſverſe bands and glaucous abdomen. *Nooni paragoodoo*, Ruſſell. Ind. Serp.

Agilis. Banded alternately with white and fuſcous, and varied with black dots: head ſmall; tail ſhort.—*Coluber agilis*, abdominal ſcuta 184, ſubcaudal ſcales 50. Linn. *Ceraſtes Agilis*, Laur.

A native of Ceylon. The head is ſmall, covered with large ſcales; body ſlender and ſmooth, about a ſpan in length, and covered with ſmall ſcales; tail ſhort, taper, and terminating rather obtuſely.

Simus. Blackiſh, with white tranſverſe bands; noſe turned up. *Coluber*.

SIMUS. Abdominal ſcuta 124, ſubcaudal ſcales 46. Linn. D. Garden.

Length eighteen inches; head rather large, and roundiſh, with the noſe flat in front, and turned up into a ſlightly pointed tip: between the eyes is a black curved band, and on the top of the head a white cruciform mark, with a black central ſpot; abdomen duſky. A native of Carolina, and other parts of North America.

PELIAS. Browniſh, with double tranſverſe black bands, beneath green with a yellow lateral band.—*Coluber pelias*, abdominal ſcuta 187, ſubcaudal ſcales 130. Linn.

A native of South America and India. Deſcribed by Linnæus from the Muſeum of Degeer.

MUCOSUS. Blueiſh, beneath pale, with angular head: lips ſtriped tranſverſely with black. *Coluber muſcoſus*, abdominal ſcuta 200, ſubcaudal ſcales 140. Linn. *Natrix mucoſa*, Laur. Amph.

Deſcribed by Linnæus from a ſpecimen in the Muſ. Ad. Fr. It is a ſmall ſpecies, meaſuring about eighteen inches in length; the native country is South America.

CINEREUS. Cinereous; abdomen white; tail recticulated above with brown, and lineated tranſverſely beneath. *Coluber cinereus*, abdominal ſcuta 200, ſubcaudal ſcales 137.

Indies, according to Linnæus South America and India: it reſembles the common ſnake, and is about two feet in length.

DIPSAS. Green with two white ſtripes. Abdominal ſcuta 152, ſubcaudal ſcales 135. Linn. *Serpens ſurinamenſis cærulæ*, Seba. Inhabits Surinam and other parts of South America.

CASPIUS. Body faſciated alternately above with yellow and fuſcous, beneath yellow. *Coluber caſpius*, Gmel. Lepech. It.

Firſt deſcribed by Lepechin as an inhabitant of the ſhores of the Caſpian ſea, where it haunts the low grounds and buſhy places. It is reported of this ſpecies, that when diſturbed it firſt endeavours to eſcape, but if purſued or irritated, ſprings forwards on its aſſailant with great fury, though incapable of doing any injury by its bite. The uſual length is about five feet.

PERUVIANUS. Black and white; abdomen roſe-coloured. *Serpens Peruviana elegantiſſima et rara*, Seba.

A native of Peru; deſcribed by Seba, who informs us it is rare in European collections. This is an innoxious ſpecies. Linnæus does not notice this ſnake, as the number of its abdominal ſcuta, and ſubcaudal plates could not be aſcertained.

HYGEIÆ. White, with ſomewhat undulated black zones, and head faſciated longitudinally with black. *Serpens ſiamenſis tænoiolis*, &c. Seba.

A ſmall ſpecies of a white colour, barred with numerous irregular black bands, nearly ſurrounding the body; head ſmall, covered with large ſcales, and marked by two broad longitudinal ſtreaks uniting at the top of the ſnout: tail rather ſhort and ſharp pointed. Inhabits Siam.

PETHOLA. Lead colour, with teſtaceous bands. *Coluber pethola*, abdominal ſcuta 209, ſubcaudal ſcales 90. Linn. 207—103. Gronovius. 207—85. Boddaert.

This ſnake inhabits Africa. In the middle of the head, between the eyes is a large ſhining ſhield, compoſed of many plates; the ſides of the head and hind-head is covered with imbricated ſcales each ſide; and the ſnout is ſharp.

No leſs than nine varieties of this ſnake are deſcribed by Gmelin after Laurenti. Theſe we ſhall enumerate in the Gmelinian order, obſerving only that on further inveſtigation it is not unlikely ſome at leaſt of thoſe ſuppoſed varieties may prove to be ſpecifically diſtinct. Thoſe are not noticed by Dr. Shaw, but that writer thinks the C. Petalarius of the Muſeum Adolphi Friderici, can hardly be conſidered as a ſpecies diſtinct from Pethola.

β. *Coronella Africana*, &c. White, with ſpots on the back; thoſe on the anterior part rounded, and gradually becoming rhomboidal, with the edges reddiſh. Laur. Amph.

γ. *Coronella ocellata*, &c. Blueiſh, with a quadruple ſeries of black ocellated ſpots, which are blue in the middle, and are diſpoſed longitudinally. Laur. Amph.

δ. *Coronella faſciata*, &c. Blueiſh white with black brown bands, and two longitudinal divided lines. Laur. Amph.

ε. *Coronella latiroſtrà*, &c. Browniſh, with a few pale bands, ſnout depreſſed. Laur. Amph.

ζ. *Coronella latiroſtra, faſciis*, &c. With yellowiſh confluent bands near the belly. Laur. Amph.

η. *Coronella ceraſtoides*, &c. Browniſh white, with very pale brown ſpots; occipital ſpots two, and longitudinal; dorſal ones eliptic, and diſpoſed in a ſingle ſtripe. Laur. Amph.

θ. *Coronella tæniata*, &c. Middle of the back marked with a brown ſtripe; belly and ſides whitiſh brown. Laur. Amph.

ς. *Coronella anguiformis*, &c. With entire circular brown bands, beneath obliquely concurrent.

PETULARIUS. Brown, with white bands, beneath pale. Abdominal ſcuta 212, ſubcaudal ſcales 102. Linn. Weigel abh. der. hall. Length from twelve to thirty inches; inhabits South America.

LEMNISCATUS. Yellowiſh white, marked at equal diſtances with triple dark brown bands. *Coluber lemniſcatus*, abdominal ſcuta 250, ſubcaudal ſcales 35. Linn. Amoen. Ac. *Natrix lemniſcata*, Laur. *Serpens annulatus*, Seba.

A native of Aſia. The length of this ſnake is about three feet, of a ſlender form, and white or yellowiſh marked throughout the whole length, at equal diſtances, with triple zones of black or deep brown, which entirely ſurround the body. The head is rather ſmall, covered with large ſcales, and marked acroſs the ſnout by a double zone, of which the ſmalleſt diviſion paſſes acroſs the noſtrils, and the largeſt acroſs the eyes. The whole animal is of a ſmooth and ſhining ſurface.

LUBRICUS. Flagelliform; white with equidiſtant black bands; body gloſſy. *Coluber lubricus*, Gmel.

Allied to the laſt ſpecies; the body is white, marked with ſingle black bands; the head is marked acroſs the ſnout by a black band, and at the top by two oblique ſtripes nearly meeting at an angle in front; the ſkin is remarkably ſmooth and gloſſy. The length of this ſnake is eighteen inches. According to Gmelin it is a native of Surinam; the ſnake deſcribed by Seba, as *Natrix lubrica, faſciis rubris*, and which is conſidered as a variety of the ſame ſpecies, is a native of Surinam.

DOLIATUS, milk-white, marked above by large, approximated, ſuboval black rings. *Coluber doliatus*, abdominal ſcuta 164, ſubcaudal ſcales 43. Linn.

A ſmall ſpecies meaſuring from eighteen inches to two feet in length; general colour milk white, marked throughout by large oval jet-black rings, the ends of which approaching each other on the top of the back, give the appearance of double bars, correſponding with the deſcription given of this ſnake by Boddaert, *Colluber albidus, annulis nigris per paria digeſtis*. Inhabits Carolina.

GEMMATUS. Blue, with a black middle-ſtripe ſpotted with white, and two lateral white ſtripes. *Le Chapelet*, La Cepede. Abdominal ſcuta 166, ſubcaudal ſcales 103.

The length of this beautiful ſnake is about fifteen or ſixteen inches; the colour on the upper parts blue, with three narrow equidiſtant ſtripes from head to tail; the two lateral ſtripes being white, the middle one black, marked by a row of ſmall white ſpecks alternately oblong and round, reſembling a ſmall ſtring of beads aud bugles: the head is covered with large ſcales, and marked on each ſide with three or four ſpots, forming a band acroſs the eyes, the top ſpotted with pale blue marks bordered with black; the abdomen white. The ſcuta are each marked at the edge with a ſmall black ſpeck, forming two rows down the abdomen. The native country of this kind is unknown, the ſpecies was deſcribed by La Cepede from a ſpecimen in the royal cabinet.

BILINEATUS. Rufous, with two golden yellow ſtripes. *La double raie*, La Cepede.

This ſnake meaſures twenty-five inches in length, of which the tail exceeds ſix inches. The general colour is rufous; every ſcale is bordered with yellow, and down the back from the head to the tail run two bright yellow ſtripes of a golden hue. The ſcales on the head are large, thoſe on the body ſmooth. The native country is unknown.

TRILINEATUS. Rufous, with three black lines. *La trois raie*, La Cepede.

The length is about eighteen inches; the head is covered with large ſcales; tail about two inches and three quarters long. This is a native of Africa.

TRIFASCIATUS. Body marked with three broad black ſtripes, the middle one divided by a white line, and three ſpotted lines down the abdomen. Shaw Gen. Zool.

A ſmall ſpecies, meaſuring a foot in length, and being rather thick in proportion; head rather large, blackiſh, with the ſutures pale. Deſcribed from a ſpecimen in the collection of Dr. William Hunter.

DIONE. Pale blue, ſpotted with brown, and three whitiſh lines. Pallas It.

This ſpecies is a native of the ſalt deſerts towards the Caſpian ſea, and of the hilly regions near the river Irtin; and was firſt deſcribed by Dr. Pallas. It is of a ſlender form, about two feet in length; the head ſmall, tetragonal and commonly reticulated with blackiſh ſutures. The two intermediate ſpaces between the three lines on the back are marked with a row of duſky alternate ſpots; and the tail is about one ſixth of the whole length.

MYCTERIZANS. Head angular, with ſharp pointed ſnout, and a yellow line on each ſide of the abdomen. *Coluber mycterizans*, abdominal ſcuta 192, ſubcaudal ſcales 167. Linn. *Coluber ſubcæruleus lateribus lineatis*, Boddaert. *Natrix micterizans*, Laur.

This ſnake is in general of a graſs-green colour, and is diſtinguiſhed in particular by the yellow line which extends the whole length of the body on each ſide of the abdomen. It is of a ſlender form, meaſuring about three feet and a half in length, and about half an inch in diameter. The head is moderately large, long, and ſharp ſnouted, the upper jaw extending far beyond the lower. Linnæus was erroneouſly led to conſider this as a poiſonous ſpecies, from the fang-like appearance of the large and long teeth in the upper-jaw. It is a native of many parts of North America, where it is principally ſeen on trees, moving with great velocity in purſuit of inſects, on which it feeds.

Gmelin deſcribes the natrix flagelli formis of Laurenti, and alſo the anguis viridis of Cateſby, as two varieties of the coluber mycterizans. The *Botla Paſſeriki* of Dr. Ruſſell may be perhaps admitted likewiſe as a variety. This differs in the colour of the under parts, inſtead of green being of a cinereous pink colour, elegantly freckled with very numerous minute black and yellowiſh dots; the margin of the ſcuta being edged with dull yellow; the ſkin of the neck alſo, when the animal is irritated, exhibits by the dilatation of the ſkin on that part, a beautiful variegation of black and white recticular marks, which do not appear at other times. This creature is repreſented as of a ferocious nature, hiſſing violently, and ſnapping at any thing oppoſed to it, but producing no other effect by its bite than that of temporary pain in conſequence of mere puncture.

COLUBER NASUTUS. *Serpens viridis, ore acuminato ex Java, aſpidio ſpecies*, Seba.

Whether this be diſtinct from the former is uncertain; the head is ſomewhat larger in proportion, and the body leſs ſlender: in other reſpects it very nearly correſponds. The length is about three feet. This ſnake according to Seba is a native of Java.

LINEATUS. Blue-green, with three or five brown linear ſtripes, the middle one broadeſt. *Coluber lineatus*, Linn. *Serpens ceilonica lineis ſubfuſcis*, Seba.

This ſnake is a native of India, and is commonly about three feet in length. The general colour is pale blueiſh green above, with a golden gloſs, and is marked throughout the whole length by five longitudinal narrow bands, or ſtripes of duſky brown or greeniſh. In young ſpecimens there are rarely more than three ſtripes. The form of this ſnake is long and ſlender, with the head ſmall, the abdomen flattiſh, and the tail long and thin.

JACULATRIX. Whitiſh, with three blackiſh ſtripes, the middle one broadeſt. *Coluber jaculatrix*, Linn. *Serpens Americana xequipiles dicta*, Seba.

Reſembles lineatus, but is ſmaller; the general colour whitiſh tinged with blue, and marked by three longitudinal ſtripes of black or deep brown, of which that in the middle is broadeſt. This appears to vary in colour, that deſcribed by Seba being yellowiſh inſtead of white. The abdominal ſcuta are 163 in number, the ſubcaudal ſcales 77. This kind inhabits Surinam, and is conſidered as a harmleſs animal.

SIBILANS. Blueiſh, with five duſky lines, and the head ſpotted. *Coluber ſybilans*, abdominal ſcuta 166, ſubcaudal ſcales 100.

This, like the laſt, reſembles coluber lineatus, being marked, as in that ſpecies, with five duſky ſtripes, the middle one of which is the broadeſt, and is nearly black, with a whitiſh ſpeck on each of the ſcales. The head is ovate, covered with large ſcales, and marked with ſeveral oblong, blue, ſubangulated ſpots, with black edges; and the tail is very long and ſlender. This animal is of conſiderable ſize, ſometimes meaſuring four feet in length; it is a native of Aſia, and is eſteemed harmleſs.

SITULA. Grey, with a longitudinal duſky band, bounded on each ſide by a black line. *Coluber ſitula*, abdominal ſcuta 236, ſubcaudal ſcales 45. Deſcribed by Haſſelquiſt as a native of Egypt.

SAURITA. Brown, with three blue-green ſtripes. *Coluber ſaurita*, abdominal ſcuta 156, ſubcaudal ſcales 121.

This is the ribbon ſnake of Cateſby, a ſpecies about three feet in length, and very beautiful. The general colour is brown above, with three moderately-broad longitudinal blueiſh-green ſtripes; the head is rather ſmall and ſomewhat pointed, the body ſlender, and the tail thin. Cateſby repreſents it as an animal extremely ſwift in its motions; it inhabits Carolina and many other parts of North America, frequents trees, and is perfectly innoxious.

VITTATUS. Whitiſh, with three black ſtripes, the middle one very narrow; abdomen white, with the edges of the ſcuta brown. *Coluber vittatus,* abdominal ſcuta 142, ſubcaudal ſcales 78. Linn. *Coluber de terragona,* Seba.

The length of this kind ſeldom exceeds thirty inches; the colour is whitiſh, tinged with blue, and marked along the whole length of the back by three black or dark brown ſtripes, the middle one of which is the narroweſt; between this and the principal longitudinal ſtripe on each ſide is a pair of extremely narrow or linear ſtripes, which are gradually loſt after paſſing ſome diſtance down the back. The head is rather ſmall; of an elongated form, covered with large ſcales, and marked with black variegations; the tail is of moderate length, ſlender, and gradually tapering to a point. This ſnake is a native of South America, and is not of the poiſonous tribe of ſerpents.

MONILIS. Whitiſh, with broad brown bands, and three ſpots on the neck. *Coluber monilis,* abdominal ſcuta 164, ſubcaudal ſcales 82. Linn.

A native of South America. This is a ſmall ſpecies meaſuring about a foot and half in length; the colour whitiſh, banded throughout the whole length with very broad tranſverſe brown bars; the head is of moderate ſize, whitiſh, and bordered with brown.

SCABER. Grey, ſpotted with brown, and the ſcales carinated by a riſing point. *Coluber ſcaber,* abdominal ſcuta 228, ſubcaudal ſcales 44. Linn. *Rauhe natter,* Merrem.

Length about eighteen inches, the form rather ſlender; head ſmall, and marked at the back of the neck with a few tranſverſe ſtreaks; the ſpots on the back are ſomewhat rhomboidal, of a brown colour, lighteſt in the centre, and diſpoſed in a triple ſeries. This ſnake is a native of India.

MAURUS. Brown, with two black dorſal lines, ſides tranſverſely banded with black, and the abdomen black. *Coluber maurus,* abdominal ſcuta 152, ſubcaudal ſcales 66. Linn. Syſt. Nat. A native of Algiers.

JUGULARIS. Black, throat ſanguineous. Haſſequiſt. Deſcribed as a native of Egypt; the abdominal ſcuta are 195, and the ſubcaudal ſcales 102.

COCCINEUS. Black, with the back yellow, ſpotted with red, and the abdomen pale. *Coluber coccineus,* abdominal ſcuta 175, ſubcaudal ſcales 35. Gmel.

Length about two or three feet, form rather ſlender, with the head ſmall, the ground colour black, with about twenty-three ſubovate ſpots of bright red, with the ſpaces between yellow. This is a native of South America.

CANDIDUS. White, with large ovate brown dorſal ſpots. *Coluber candidus,* abdominal ſcuta 220, ſubcaudal ſcales 50. Linn. *Serpens æſculapii braſilienſis,* Seba.

General colour milk-white, marked throughout with a row of deep brown ovate patches; the head is brown, and covered with large ſcales; tail of moderate length, gradually tapering to the extremity. This is a native of South America.

NEBULATUS. Clouded with fuſcous and cinereous, beneath varied with white and brown. *Coluber nebulatus,* Linn. Weigel. Abh. Hall. *Ceraſtes nebulatus,* Laurenti.

A native of America. This is of a moderate ſize, meaſuring about two feet in length; the head is rather large in proportion, and covered with ſcales of conſiderable ſize; body rather ſlender, and the tail tapering rather ſuddenly from the body. The colour is yellowiſh brown, clouded with irregular deep-brown, or blackiſh variegations diſpoſed ſomewhat in the form of bands, and nearly ſurrounding the body.

PADERA. White, with blackiſh dorſal ſpots, connected by a line and lateral ſpots. *Coluber padera,* abdominal ſcuta 198, ſubcaudal ſcales 56. Linn. A native of India.

AUSTRALASIÆ. Blackiſh brown, ſpeckled with yellow; ſcuta very narrow, and the abdomen clouded with brown and yellow. *Auſtralaſian ſnake,* Shaw Gen. Zool. White's Journ. New South Wales.

This is a large ſnake, meaſuring nine or ten feet in length, and being rather ſlender in proportion; the colour above deep or blackiſh brown, variegated with numerous yellow ſpecks, ariſing from the circumſtance of the middle of every ſcale being marked with an ovate yellow ſpot. On the ſides of the body many of the ſcales are yellow on one half and black on the other, and by degrees appear more tinged with yellow as they approach the abdomen, which is clouded with a mixture of brown and yellow; the head is ſmall, and covered in front with moderately large ſcales; the teeth rather large, and unaccompanied, ſo far as can be aſcertained from the dried ſpecimens hitherto examined, by any poiſonous fangs.

SCHOCKARI. Cinereous brown, with a double white longitudinal band each ſide; abdomen whitiſh; throat yellowiſh, and ſpeckled with brown. *Coluber ſchockari,* abdominal ſcuta 180, ſubcaudal ſcales 114.

Deſcribed by Linnæus after Forſkal, as being about a cubit and a half in length, and the thickneſs of a finger; the colours as above deſcribed, except that, as the ſnake advances in age, a narrow ſtripe, compoſed of ſmall whitiſh ſpots, is obſervable down the middle of the back. The head is ovate, obtuſe, and covered with large ſcales, and the tail about a third of the whole length. A native of the woody parts of Arabia.

HOELLIEK. Entirely red. Forſk. Forſkal deſcribes this as a native of Arabia. It is about a foot in length; the bite of this ſnake is ſaid to cauſe an inflamed tumour, and its breath to excite an itching in the ſkin.

REGINÆ. Violaceous brown; beneath white, with a ſemi-orbicular brown ſpot on each alternate ſcuta. *Coluber reginæ,* abdominal ſcuta 137, ſubcaudal ſcales 70. Linn. Weigel. Abh. Der. Hall. &c.

Length twelve inches; the tail is of a moderate length, and rather ſlender, and the ſcales beneath are plain. A native of India, and conſidered, by ſome writers, as an inhabitant likewiſe of America.

CYANEUS. Deep blue, beneath cinereous. *Coluber cyaneus,* abdominal ſcuta 119, ſubcaudal ſcales 110. Linn. *Anguiculus ſurinamenſis cyaneus,* Seba.

This is a ſmall ſpecies; the head is of a moderate ſize, rather long, and covered with ſcales of a large ſize; tail long, and tapering gradually to a point. Inhabits South America.

EXOLETUS. Blueiſh-grey; head oblong and flattiſh; lips and throat white. *Coluber exoletus,* abdominal ſcuta 147, ſubcaudal ſcales 132. *Natrix exoletus,* Laur. Amph. p. 78.

Inhabits South America and India. The length is three feet; the ſcales on the body are obtuſe, and arranged in eleven rows; the head oblong and flattiſh; tail ſlender, a foot in length, and pale beneath

DHARA. Coppery-grey, with the edges of the ſcales whitiſh; beneath white. *Coluber dhara,* abdominal ſcuta 235, ſubcaudal ſcales 48.

The length of this ſnake exceeds a cubit; the thickneſs leſs than a finger. The head is ovate, obtuſe, and covered with large ſcales, of which thoſe in the middle between the eyes are larger than the reſt. A native of Arabia. Forſk.

TYRIA. Whitiſh, with a triple ſeries of rhomboidal ſpots. *Coluber tyria,* Linn. Deſcribed by Haſſelquiſt as a native of Egypt

FULVIUS. Fulvous, ſpotted with brown, the body annulated with black bands, and the tail very ſhort. *Coluber fulvius,* abdominal ſcuta 218, ſubcaudal ſcales 31. Linn.

Length about eighteen inches; the head brown above, and covered with large ſcales. A native of North America.

Constrictor. Shining black, with the body very long and ſlender. *Coluber conſtrictor*, abdominal ſcuta 186, ſubcaudal ſcales 92. Linn. *Black ſnake*, Cateſby. Carol.

According to Cateſby, this is a large and very long ſnake, ſome attaining to the length of ſix feet; they are entirely of a ſhining black colour, and are very nimble and beneficial in killing rats, which they purſue with wonderful agility to the roofs and all parts of houſes and barns, where rats are able to run, and for this ſervice are preſerved by moſt of the inhabitants; they are bold and furious, leaping at and biting thoſe that attack them, though no harm enſues, their bite not being venomous; it is commonly ſaid, in Carolina, they will attack the rattle ſnakes, and ſwallow them. "It is certain," ſays Cateſby, "moſt or all ſnakes will devour one another, not only of their own but of all other kinds, which I have often ſeen; one, after a long ſtruggle, ſwallowing another, but little leſs than itſelf."

Sirtalis. Brown, with three blueiſh-green bands. *Coluber ſirtalis*, abdominal ſcuta 150, ſubcaudal ſcales 114. Linn. Deſcribed by Kalm as a Canadian ſpecies.

Decorus. Blueiſh-green, with a double lateral band of black, and black ſpots on each ſide the neck.

A ſpecies deſcribed by Dr. Shaw, from a ſpecimen in the Britiſh Muſeum. Its habit is ſlender and flagelliform; length about two feet and a half; the colour pale, blueiſh, gilded green, with irideſcent variegations; beneath paler, or more inclining to white; on each ſide the body, near the abdomen, a double black ſtripe; head longiſh, covered with large ſcales, immaculate, and marked each ſide, through the eyes, by a broadiſh black ſtripe broken into ſpots, and which, paſſing to ſome little diſtance along the neck, becomes divided, and forms the double lateral ſtripe before mentioned. The eyes are large: tail very long and ſlender.

Domicella. White, with numerous deep black tranſverſe bands meeting beneath, and a blackiſh abdominal line. *Coluber Domicella*, abdominal ſcuta 118, ſubcaudal ſcales 60. Linn. *Anguis bioclor elegantiſſimus malabaricus*, Seba.

Length about two feet and a half, diameter half an inch; the head is ſmall, covered with large ſcales; tail rather ſhort and tapering to a point. This is a native of India; it is ſaid the ladies in India ſometimes carry this ſnake in their boſoms, and hence Linnæus named it domicella.

Viridissimus. Bright green; abdomen whitiſh, with the ſcuta dilated towards the middle. *Coluber viridiſſimus*, abdominal ſcuta 217, ſubcaudal ſcales 122.

This beautiful ſnake is a native of Surinam. The length is about three feet; head ſlightly obtuſe, of moderate ſize, covered with very large ſcaly plates; the remainder of the upper parts with ovate ſcales; the tail is of moderate length and ſlender. The green on the back inclines more or leſs to blue or purple in different individuals, and the abdomen in ſome than in others. It is eſteemed a harmleſs ſpecies.

Cursor. Greeniſh, with two dorſal ſtripes of linear white ſpots, and whitiſh ſides and abdomen.—*La Coureſſe*, Cepede. Abdominal ſcuta 185, ſubcaudal ſcales 105.

A ſpecies deſcribed by La Cepede, from a ſpecimen in the Royal Cabinet at Paris. The length is near three feet; the head is covered with large ſcales, the tail of moderate length and gradually tapering to the tip. It is ſaid to be a timid animal, and remarkable for the ſwiftneſs of its motions. This inhabits the iſland of Martinico.

Hickanella. White, ſpeckled above with blue, and variegated with blue on the abdomen. *Serpens bikkanella Americanus*, Seba.

A native of South America, where it frequents houſes, and is very uſeful in deſtroying rats, mice, and other vermin. It is about two feet and a half in length, the thickneſs moderate, head oblong, and covered with large ſcales, tail rather ſhort, and gradually tapering.

Perlatus. Pearl-coloured; head and tail ſea-green, the former marked by a red ſpot. *Serpens ex novo Hiſpania*, a Fabro Lynceo.

This ſnake is about two feet and a half in length, and rather thick, except towards the tail, where it gradually tapers to a ſlender point; the top of the head is covered with ſmall ſcales except about the noſe and between the eyes. It is a native of New Spain.

Platurinus. White, ſpotted with brown, and annulated with broad brown zones. Shaw Gen. Zool.

Deſcribed from a ſpecimen in the muſeum of Dr. William Hunter. It reſembles the common ſnake C. natrix, but the tail is rather more ſlender in proportion; the head is rather large, and covered with large ſcales of a black brown colour, elegantly marked with intervening ſpaces of white; the whole animal is about three feet and a half in length.

Argus. Cheſnut-brow, banded with tranſverſe rows of ocellated red ſpots; beneath yellow. *Coluber argus*, Linn. *Serpens arabica braſſilienſibus iboboboca*, and *Boiguacu dicta*; alias *argus*, Seba.

The argus ſnake is a large and elegant ſpecies, meaſuring, according to Seba, above five feet in length, and being of a moderate thickneſs in proportion. The head is large, flattiſh, covered in front with ſmall ſcales, and ſo very protuberant on each ſide at the hind part, ſo as to appear heart-ſhaped. The ground colour is brown, very beautifully marked from head to tail by numerous tranſverſe rows of round ocellated red ſpots, ſurrounded by a white iris, and an exterior red one; the abdomen beneath is pale yellow; tail moderately ſlender and tapering to a point. It is a native of Arabia, and ſeems to be conſidered as a poiſonous ſpecies.

Ocellatus. Cheſnut-brown, with ocellated brown ſpots, and yellow abdomen. *Serpens guineenſis rariſſima argus dicta*, Seba.

In ſize reſembles the viper; the head is covered with ſmall ſcales; tail tapers to a moderately ſlender tip. This, according to Seba, is a native of Guinea, and is a rare ſpecies.

Chiametla. Blue, the ſcales marked with a white ſpot, body beneath yellow. *Serpens americana chiametla dicta*, Seba.

A beautiful ſpecies about four feet and a half in length, found in the Weſt Indian iſlands.

Zeylonicus. Abdominal ſcuta 180, ſubcaudal ſcales 80. Gmel. Gronov. *Coluber maculis majoribus brunneis*, Boddaert. *Serpens maculata ceylonica*, Seba. *Serpens americanus*, Scheuchz.

Catus. White; the ſcales diſpoſed in fours, black, and thickly crowded into patches. *Coluber catus*, Gmel. *Coronella catus*, Laur. Amph.

A native of America; it is obſerved of this ſnake that it lies in wait, and ſprings upon mice like the cat, whence its name.

Cervinus. White, dotted in the middle with black, and branched with black at each end. Gmel. *Coronella virginica*, Laur. Amph. Inhabits America.

Tessellatus. Above alternately teſſellated with black and brown; beneath black with white unequal ſpots each ſide; head long and ſhielded. Gmel. *Coronella teſſellata*, Laur. Amph.

RUBER. Bright red with the ſpots alternately uniting; beneath white. Gmel. A doubtful ſpecies.

MOLURUS. Abdominal plate 248, ſubcaudal ſcales 59. Gmel.

This kind inhabits South America, and reſembles the Boa tribe, but is diſtinguiſhed by the plates, and large ſcales on the head, as in the coluber genus.

MINERVÆ. Glaucous, with a brown dorſal ſtripe, and three on the head; abdominal ſcuta 238, ſubcaudal ſcales 90. Linn.

Length about eighteen inches; thickneſs exceeding that of a ſwan quill; the colour glaucous, with a broad, longitudinal, brown band down the back, and three longitudinal bands on the heads, two of which paſs through the eyes. The head is oblong, ovate, convex, and ſmooth; the eyes large; tail ſlender, and meaſuring about a third of the whole length. Deſcribed by Linnæus from a ſpecimen in the muſeum Adolphi Friderici brought from the Eaſt Indies.

SCUTATUS. Black; ſcuta extremely broad; tail ſubtriangular. *Coluber ſcutatus*, abdominal ſcuta 190, ſubcaudal ſcales 50. Pallas.

Reſembles the common ſnake, *coluber natrix;* the length is about four feet; colour entirely black, except that the abdomen is marked alternately on each ſide with a row of ſmalliſh ſquare yellowiſh-white ſpots. The principal character conſiſts in the ſcuta being remarkably wide, extending on each ſide in ſuch a manner as to embrace two-thirds of the body. This ſpecies was obſerved by Dr. Pallas about the borders of the river Ural; it is found occaſionally both in the water and on land.

HIPPOCREPIS. Livid, ſpotted with brown, with a reverſed lunulated or horſe-ſhoe mark on the back part of the head. *Coluber hippocrepis*, abdominal ſcuta 232, ſubcaudal ſcales 94. Linn. Muſ. Ad. Fr.. *Natrix hippocrepis*, Laur.

Length about twelve inches; head of moderate ſize, marked by a tranſverſe arched brown band between the eyes, and a larger horſe-ſhoe-ſhaped mark on the back of the head; abdomen pale; tail tapering gradually from the tip. A native of America.

DOMESTICUS. Grey, ſpotted with brown; a bipartite black ſpot between the eyes. *Coluber domeſticus*, abdominal ſcuta 245, ſubcaudal ſcales 94. Linn.

This is a native of Barbary, where it appears to be in ſome degree domeſticated, being very common in the houſes of the inhabitants, where it is kept to deſtroy the ſmaller kind of noxious animals. In its general appearance this ſnake is allied to the laſt-mentioned ſpecies, and like that is perfectly harmleſs.

DUBIUS. Abdominal ſcuta 141, ſubcaudal ſcales 24. Linn. Gron. Muſ. Seba.

EXALBIDUS. Whitiſh with tranſverſe broad ſpots mixed with black and white.

COLUBER EXALBIDUS, abdominal ſcuta 135, ſubcaudal ſcales 42. Gmel. *Coluber exalbidus maculis tranſverſis latiſſimis ex et albo mixtis.*

CAHIRINUS. Grey, with large oval brown ſpots on the back, and ſmall quadrangular notched ſpots on the ſides; beneath ſilky white. *Coluber cabarinus*, abdominal ſcuta 230, ſubcaudal ſcales 82. Forſk. Fn. Arab.

Inhabits Cahira. Length four feet and a half, and the thickneſs that of a finger; the head is flattiſh, ſub-cordated, with two pale oblong ſcales on the crown,

CALAMARIUS. Livid, with tranſverſe brown bands and linear points; beneath teſſelated with brown and white. *Coluber calamarius*, abdominal ſcuta 140, ſubcaudal ſcales 22. Linn.

This is a ſmall ſnake, meaſuring about a ſpan in length, the thickneſs that of a gooſe-quill; colour above livid, ſprinkled with linear duſky ſpots, and marked by ſeveral dark narrow tranſverſe bars; the head is very ſmall, convex, and ovate; the tail ſhort and terminating obtuſely. This ſpecies inhabits America.

CARINATUS. Lead-coloured, with large ovate, porous ſcales; back carinated; abdomen whitiſh. *Coluber carinatus*, abdominal ſcuta 157, ſubcaudal ſcales 115. Linn. Muſ. Ad. Fr.

A large ſpecies, growing to the length of five or ſix feet, and of a moderate thickneſs; tail tapering gradually to a point; tail much carinated, riſing into a ridge on the top; colour deep blueiſh brown, or cinereous, inclining to lead-colour, paler or whitiſh underneath; ſcales very large and marked with numerous impreſſed points as if pierced with pin-holes. This is repreſented as a harmleſs ſpecies; it inhabits North America, and varies in colour.

GETULUS. Blueiſh-black, with linear yellow lines on the ſides and bifid bands on the belly. *Coluber getulus*, abdominal ſcuta 215, ſubcaudal ſcales 44. Linn. D. Garden.

Inhabits Carolina, where it frequents moiſt woods and ſhady places, and preys on lizards. Length about three feet. An elegant ſpecies.

PLICATILIS. Livid, with a ſtripe of duſky brown confluent ſpots on each ſide, the anterior ones ocellated with a white pupil. *Coluber plicatilis*, abdominal ſcuta 131, ſubcaudal ſcales 46. Linn. Amoen. Acad. *Ceraſtes plicatilis*, Laur. Amph. *Serpens baliſalan-boeket*, Seba.

Length from two to three feet; the colour browniſh-yellow or livid, with a duſky and lateral ſtripe of confluent ſpots immediately above the centre, the anterior ones of which have a white dot in the centre. The abdomen is pale, and marked with three or ſometimes four rows of ſmall duſky ſpots. The head is covered in front with large ſcales, ſnout obtuſe; tail thick and rather blunt. The ſpecimen deſcribed by Linnæus meaſured, as above-mentioned, leſs than three feet, that deſcribed by La Cepede, a ſpecimen in the Muſeum of the king of France, was more than ſix feet long, from which it appears this ſnake is of a large ſize when full grown.

BATAEN. Spotted with black and white. Forſk. Fn. Arab.

Deſcribed by Forſkal as a native of Arabia; it is a foot in length and two inches in thickneſs, and is highly poiſonous; the body ſwelling to a great ſize after being bitten by this ſnake.

HANNASCH. Entirely black. Gmel. Inhabits Arabia, a cubit in length, and as thick as a finger.

PURPURASCENS. Abdominal ſcuta 189, ſubcaudal ſcales 122. Gmel.

PICTUS. Abdominal ſcuta 172, ſubcaudal ſcales 142. Gmel. Boddaert.

HAJE. Black, with oblique bands, and ſcales half white. *Coluber haje*, abdominal ſcuta 207, ſubcaudal ſcales 109. Linn.

Firſt deſcribed by Forſkal. This ſnake inhabits Lower Egypt, is of a very large ſize, when irritated lifts up, and ſtretches out its head to bite.

PULLATUS. Bands of the body black with white dots; temples ſnowy with black ſpots; beneath white with black ſpots. *Coluber pullatus*, abdominal ſcuta 217, ſubcaudal ſcales 108. Gmel. A native of Aſia.

CARACARAS. Blue, with the ſcales on the fore-part of the body elongated; thoſe behind rhomboidal, and the neck tranſverſely ſtriated with black, *Coluber caracaras,* abdominal ſcuta 190, ſubcaudal ſcales 125. Linn. *Serpens caracaras braſilienſis ſingularis,* Seba

A ſpecies of moderate ſize, length two feet and a half; the head rather large and oblong; ſnout obtuſe; from behind each eye a black ſtreak; colour pale blue, the poſterior part of the body tinged with roſe colour; the ſcales on the fore parts of the animal are of a narrow lengthened form, and on the hind parts rhomboid; neck and anterior parts elegantly marked by numerous tranſverſe black lines; tail rather long, and gradually tapering to the tip. This ſpecies inhabits Braſil.

STOLATUS. Glaucous, with two whitiſh ſtripes, and quadrangular tranſverſe brown ſpots between. *Coluber ſtolatus,* abdominal ſcuta 143, ſubcaudal ſcales 76. Linn. Laurenti. Seba.

Deſcribed from a ſpecimen in the Muſeum Adolphi Friderici as a poiſonous ſnake, but it appears erroneouſly ſo. This ſpecies inhabits India. It is of the middle ſize, meaſuring from a foot and a half to two feet or more in length. The colour is blueiſh above, with two rather remote white lines down the back, and a continued ſeries of brown, tranſverſe, equidiſtant zones. The abdomen is pale or white, each ſcutum being marked on each ſide by two ſmall ſpecks; the head is covered with large ſcales, pale or blueiſh above, and of moderate ſize; tail rather ſhort and tapering to a point.

AURORA. Orange coloured, with the dorſal band and abdomen yellow. *Coluber aurora,* abdominal ſcuta 179, ſubcaudal ſcales 37. Linn. Muſ. Ad. Fr. *Ceraſtes aurora,* Laur Amph. *Serpens acontias, &c.* Seba.

Length two feet and a half, and of moderate thickneſs in proportion; general colour dull orange, with a broad dorſal line of pale yellow; head rather large and covered with very large ſcales; tail rather ſhort and tapering to an obtuſe point. Inhabits South America.

PALLIDUS. Grey, ſpeckled with brown, and marked with a double, interrupted black line on each ſide. *Coluber pallidus,* abdominal ſcuta 156, ſubcaudal ſcales 96. Linn. Amoen. Acad.

Linnæus deſcribes this as being a foot and a half in length, and the thickneſs of a ſwan-quill, with the back ſlightly angulated each ſide. The head is roundiſh, much thicker than the neck and covered with large ſcales; the ground colour pale variegated with ſcattered grey ſpots and points. Inhabits India.

ORIENTALIS. Abdominal ſcuta 202, ſubcaudal ſcales 96. Gmel. Boddaert. *Vipera vera orientalis,* Seba. Inhabits Eaſtern countries.

OVIVORUS. Abdominal ſcuta 203, ſubcaudal ſcales 73. Gmel. *Guinpuajura,* Piſ. Braſil.

We only know of this ſpecies that the plates and ſcales are as above deſcribed, and that the ſpecies inhabits America.

CENCHOA. Head globoſe; body whitiſh, with tranſverſe rhomboidal brown bands. *Coluber cenchoa,* abdominal ſcuta 210, ſubcaudal ſcales 124. Linn. *Anguis de cencoatl americanus,* Seba.

A long and very ſlender ſpecies growing ſometimes to the length of three or four feet, and yet ſcarcely exceeding the thickneſs of a ſwan-quill. The head is very large and nearly globular, the neck extremely thin; and the tail remarkably long, meaſuring nearly a third part of the whole animal, and gradually tapering to the extremity. The colour is white or yellowiſh, marked throughout the whole upper part from the head to the end of the tail, with numerous tranſverſe rhomboidal bars, or patches of brown, the points of which deſcend on each ſide.

FLAGELLUM. Extremely long, ſlender, and brown; abdomen pale. *Coach-whip ſnake,* Cateſby.

This ſpecies meaſures from four to five feet; or even ſix feet in length, and is remarkably ſlender. Cateſby, who deſcribes this ſnake, ſpeaks of it as an active nimble creature, running very ſwiftly and being perfectly harmleſs, "yet, ſays he, the Indians report, not without gaining many proſelytes to their ſilly belief, that it will by a jerk of its tail, ſeparate a man in two parts." This ſnake is a native of Carolina and Virginia.

AHAETULLA. Bright blue-green and irideſcent; abdomen pale, with a black ſtreak acroſs the eyes. *Coluber ahaetulla,* abdominal ſcuta 163, ſubcaudal ſcales 150. Linn. Amoen Acad. *Natrix ahaetulla.* Laur. Amph. *Serpens ornatiſſima amboinenſis bouguatrora.* Seba. *Long green Borneo ſnake,* Petiver.

The general colour is a bright blue green with a golden gloſs, and highly irideſcent. The length is from three to four feet, and the diameter about three-fourths of an inch; the head is covered above with large ſcales, and the ſnout is ſlightly elongated, though not pointed; the tail is ſomewhat angular, and of conſiderable length. It is an innoxious ſpecies, is found in ſeveral parts of India, and is eſteemed one of the moſt beautiful of the ſerpent race.

AESTIVUS. Blue green, ſlender; ſnout obtuſe; abdomen pale green. *Coluber æſtivus,* abdominal ſcuta 155, ſubcaudal ſcales 144. Gmel. *Green ſnake,* Cateſby.

Long and ſlender, the general length about three feet; the head is obtuſe; colour of the upper parts blue green, ſlightly tinged with purple; tail very long and ſlender. This kind inhabits many parts of North America, where it frequents trees and preys on flies and other inſects. Cateſby, to whom we are indebted for the above particulars, adds, that it is eaſily reclaimed from its natural wildneſs, becoming tame and familiar, and affirms that ſome people carry it in their boſoms.

FILIFORMIS. Very ſlender, black; beneath white. *Coluber filiformis,* abdominal ſcuta 165, ſubcaudal ſcales 158. Linn. Muſ. Ad. Fr. *Natrix filiformis,* Laur.

Length about twelve inches, and thickneſs that of a gooſe-quill; the colour above black, appearing like a broad dorſal ſtripe, beneath white; the head is ovate, twice the diameter of the body, above black and beneath white; tail about one-third the whole length, very ſlender, and ſharp-pointed. A native of India.

TORQUATUS. Black above, beneath red, with a white collar round the neck. Shaw Gen. Zool. *Little black and red ſnake,* Edwards.

A ſmall ſpecies, leſs than an earth-worm; head and upper parts jet black, and gloſſy; the head rather large, and covered with large ſcales; eyes flame-coloured. This is a native of Pennſylvania where it inhabits crevices of rocks, old walls, &c. and feeds on inſects.

SIPEDON. Entirely black or deep brown. *Coluber ſipedon,* abdominal ſcuta 144, ſubcaudal ſcales 73. Linn. A native of North America; deſcribed by Kalm.

DABOYA SNAKE, *Le daboie,* La Cepede.

Deſcribed by La Cepede who conſiders it as the ſpecies which in the kingdom of Juda, and ſome other parts of Africa, is regarded as a deity, and kept in temples conſecrated to its worſhip. This ſuperſtition is ſaid by the traveller, De Marchais, to have ariſen from the following circumſtance; the army of Juda being on the point of yielding to that of Ardra, it happened that a large ſerpent of this ſpecies made its appearance, which the chief prieſt probably knowing it to be innoxious lifted it up in his arms and diſplayed as a kind of miracle, or at leaſt as a propitious omen, perſuaded the army again to rally, by which means a ſignal victory was obtained, and the animal was in conſequence exalted into a divinity. It is ſaid to arrive at a very conſiderable ſize, and is of a whitiſh colour, ornamented on the upper part throughout the whole length by a triple row of large oval rufous patches bordered with black, the head is rather large, and is covered with oval carinated ſcales ſimilar to thoſe on the reſt of the animal. The individual deſcribed by La Cepede was preſerved in the Royal Cabinet, and meaſured three feet five inches in length.

Braſilian Snake, *La braſiliene*, La Cepede.

Length three feet; head and body covered with oval carinated ſcales, ſnout terminated by a large and almoſt perpendicular ſcale rounded at the top, but emarginate at the bottom for the paſſage of the tongue; upper parts of the animal marked with large oval rufous patches bordered with black, and in the intervals between the large patches are ſeveral much ſmaller ones of a duſky colour; fangs very large. This is a native of Braſil, and La Cepede believes may be about ſix feet in length when it has attained its full ſize.

Triangular-headed Snake, *La tête triangulaire*, La Cepede.

Reſembles the common viper in general appearance. The colour is greeniſh, with ſpots of different ſhapes on the head and body, uniting ſo as to form a regular band down the back; abdomen duſky, edged with white. The head is of a more triangular ſhape than uſual, and covered with ſmooth ſcales, as are likewiſe the body. Its total length is two feet. This kind inhabits the iſland of Euſtatia.

Panther Snake, *La tigrée*, La Cepede.

Allied to the laſt; length about eighteen inches; head as in the common viper. Colour of the upper parts whitiſh, rufous, with duſky ſpots bordered with black like thoſe on the ſkin of the panther or leopard. The native country unknown.

The *coluber hydrus*, and *coluber laticaudatus* of Linnæus, are excluded from the above, and will be deſcribed under the article Hydrus, the new genus to which they are referred by Mr. Schneider, and which we think it right to adopt. They are generally diſtinguiſhed from the colubrine tribe by having the body ſlender in front, becoming gradually thicker, ſcaled, and the tail compreſſed. See Hyrdus.

COLUBRARIA *Inſula*, in *Ancient Geography*, an iſland of the Mediterranean ſea, near the Baleares. Pliny ſays that the ſoil engendered ſerpents. It is thought to be the preſent iſle of Formentera, and the ſame with that which the Greeks called Opdiuſa, from ὄφις, *ophis*, *a ſerpent*. It lies S. of Yicca, and was inhabited.

COLUBRINUM *Lignum*. See Lignum Colubrinum.

COLVEND *Copper-Mine*, in *Mineralogy*, Galway county, in Ireland; the ſpecimens of ore found in this mine are very beautiful and deſerving the attention of mineralogiſts and collectors. See Willimes's Mineral Kingdom.

COLVILLE, Cape, in *Geography*, a cape on the eaſt coaſt of New Zealand; lying in S. lat. 36° 26′. E. long. 194° 27′. This cape riſes directly from the ſea, to a conſiderable height, and is remarkable for a lofty rock, which may be diſtinguiſhed at a very great diſtance. From the S. point of this cape the river Thames runs in a direct line S. by E., and is no where leſs than three leagues broad for the diſtance of fourteen leagues above the cape, and there it is contracted into a narrow ſtream, but continues the ſame courſe through a flat country, or broad valley, which lies parallel with the ſea-coaſt. On the eaſt ſide of the broad part of this river the land is tolerably high and hilly; on the weſt ſide it is rather low, but the whole is covered with verdure and wood, and has the appearance of great fertility, though there were in Cook's voyage, Nov. 1769, but a few ſmall ſpots which had been cultivated. Six leagues within cape Colville, under the eaſtern ſhore, are ſeveral ſmall iſlands, which, together with the main, ſeem to form good harbours; and oppoſite to theſe, under the weſtern ſhore, lie other iſlands of which, probably, good harbours may be formed. The river affords good anchorage, and is defended from the ſea by a chain of iſlands, lying acroſs the mouth of it, and on this account called by Cook "Barrier Iſlands;" theſe ſtretch N.W. and S E. 10 leagues. The S. end of the chain lies N.E. between two and three leagues from cape Colville; and the N. end lies N.E. 4½ leagues from Point Rodney. "Point Rodney" lies W.N.W. nine leagues from cape Colville, in S. lat. 36° 15′. W. long. 184° 33′. The natives, reſiding near the river, are not numerous; but they are a ſtrong, well-made, and active people, and all of them paint their bodies with red ochre and oil from head to foot. Their canoes were large and well-built, and adorned with carving.

COLUMB, St. Major, a market town of England, in Cornwall, in the hundred of Pider; 19 miles N.E. of Truro, and 245 W. of London. This town had for ſome years a communication with the ſea-coaſt by means of the Columb canal, but which is now filled up and diſuſed. The Mawgan canal was alſo another abortive attempt at conducting a permanent navigation into this elevated neighbourhood for the conveyance of its China-ſtore and potters' clay to the place of ſhipping.

Columb, *St. Minor*, a village of Cornwall, in the hundred of Pider: the ſituation of its church ſteeple was determined in the Government Trigonometrical Survey in 1796, by obſervations from St. Agne's ſtation, diſtant 58,448 feet, and bearing 44° 7′ 57″ S.W. from the parallel to the meridian of St. Agnes; and from Henſbarrow ſtation diſtant 53,942 feet; whence is deduced its latitude 50° 25′ 21″.0 N. and its longitude 5° 1′ 29.3″ or $20^{m}\ 5^{s}.9$ W. of Greenwich.

COLUMBA, in *Ornithology*, the genus pigeon. Thoſe have the bill ſtraight, and deſcending towards the tip; the noſtrils oblong, and half covered with a ſoft tumid membrane.

The pigeon tribe is divided into two families, the firſt having the tail even at the end, and of moderate length; the other cuneated and long.

* *Section*. Tail of moderate length, and even at the end.

Oenas. Blueiſh; neck above gloſſy-green; double band on the wings and tip of the tail blackiſh. Linn. Fn. Suec. *Oenas*, or *Vinago*, Aldr. Will. *Stock dove*, Arct. Zool. *Holtztaule*, Friſch.

The ſtock dove inhabits Europe and Siberia, frequenting rocky places and ruins in retired ſituations.

Domestica. Cinereous; rump white; band on the wings, and tip of the tail blackiſh. Linn. Fn. Suec. Scopoli. *Columba domeſtica*, Briſſ. *Common pigeon*, Ray, Albin, &c. *White rumped pigeon*, Lath.

The common, or domeſtic pigeon admits of an infinite number of varieties, many of which are remarkable for the beauty and elegance of their plumage; the principal varieties of theſe birds have been minutely regarded by Buffon and ſome other writers, and are enumerated in the following order in the Gmelinian Syſtema Naturæ.

Livia. Stock dove. Wings with a double blackiſh band, called by Buffon *biſet*, and by Albin the *ſtock dove.*

Saxatilis. Rock pigeon. Quill-feathers fuſcous. *Columba rupicola* of Ray.

Hispanica. Roman pigeon. Cere whitiſh and ſcurfy. *Columba romana* of Briſſon. *Columba domeſtica major*, Ray. *Pigeon romain*, Buff. *Greater tame pigeon*, Willughby.

Dasypus. Rough-legged pigeon. Legs rough with feathers. *Rough footed dove*, Willughby. *Rauchfüſige taube*, Friſch.

Cristata. Creſted pigeon. Head creſted; legs hirſute and cinerous. *Pigeon huppé*, Buff.

Norwegica. Norway pigeon. Head creſted; legs hirſute and ſnowy. Briſſ.

Barbarica. Barbary pigeon. Area of the eyes naked and papillous; a double black ſpot on each wing. *Pigeon de barbarie*, Buff. *Barbary pigeon*, Ray.

Cucullata. Jacobine. Feathers of the hind head erect, reflected. *Columba anglica*, or *ruſſica*, Geſn. *Pigeon nonain*, Buff. *Jacobine*, Ray. *Zahme ſchlagtaube*, Friſch.

Hispida. Laced pigeon. Down ſmall, erect, and diſperſed over the back and wings. *Columba criſpa*, Aldr. *Pigeon friſé*, Buff.

Turbita. Turbit pigeon. Feathers on the breaſt recurvate. *Pigeon à cravate*, Buff. *Turbit*, Ray.

Laticauda. Shaker pigeon. Tail erect, many-feathered, and broad. *Pigeon paon*, Buff. *Broad-tailed ſhaker*, Ray. *Pfauentaube*, Friſch.

Gyratrix. Tumbler pigeon. Throws itſelf over and over in flight. *Pigeon culbutant*, Buff. *Tumbler*, Ray. *Tummeltaube*, Friſch.

Galeata. Helmet pigeon. Head and quill-feathers of one colour, and different from that of the body. *Pigeon cuiraſſé*, Buff. *Helmet pigeon*, Ray.

Turcica. Turkiſh pigeon. Cere papillous and red. *Türkiſche taube*, Friſch. *Turkiſh* or *Perſian pigeon*, Willughby.

Tabellaria. Carrier pigeon. Cere broad, carunculated and whitiſh; eye-lids naked. *Carrier pigeon*, Ray, Willughby.

Gutturosa. Cropper pigeon. Breaſt inflated. *Pigeon groſſe gorge*, Buff. *Cropper pigeon*, Ray. *Kropftaube*, Friſch.

Eques. Light-horſeman pigeon. Breaſt inflated; cere carunculated. *Light horſeman pigeon*, Ray.

Percussor. Smiter pigeon. Strikes its wings violently in flight. *Smiter pigeon*, Ray, Willughby.

Jubata. Turner pigeon. Creſt hanging down from the crown like a mane. *Turner pigeon*, Will.

Maculata. Spot pigeon. White tail and frontal ſpot of one colour. *Spot pigeon*, Willughby.

Montana. Orbits naked and red; body rufous, beneath yellow. Linn. *Columba rufa cayennenſis*, Briſſ. *Perdix montana*, Ray. *Mountain partridge*, Sloane, Brown, &c. *Partridge pigeon*, Latham.

This bird, is eight inches and a half in length. The bill is red, with a black tip; the irides red, and ſurrounded with a warty ſkin of the ſame colour; the upper parts of the body are rufous, with a purpliſh hue; the under part of the neck, with the breaſt fleſh colour; belly, ſides, and vent, ſomewhat rufous; under wing-coverts, quills, and tail rufous; legs red, with the claws black. Thoſe birds inhabit Cayenne; they build in trees which have the boughs hanging low, and line their neſts with hair and cotton. They feed on the berries of the myrtle. Dr. Latham ſuſpects, that this ſpecies is found in St. Helena, as a bird is mentioned in Mr. Anderſon's catalogue, under the name of *columba perdix*, and which is ſaid to be very common in that iſland. A kind of pigeon, conceived to be a variety of the above, is deſcribed by Edwards; the forehead is of a clay colour; the head and neck, reddiſh purple; back, wings, and tail, red brown, with a gloſs of copper-colour; the fore part of the neck is reddiſh clay colour; breaſt, belly, thighs, and under tail-coverts, light clay colour; a white mark on each ſide under the eye, and another at the ſide of the throat, and juſt at the joint of each wing.

Tetraoides. Head, and neck black, with white margin. Scop. *Tetraoid pigeon*, Lath.

The only account we have of this bird, is from the work of Scopoli. Ann. 1. p. 125. He informs us it equals the red-legged partridge in ſize, and that the head and neck are black, and encompaſſed with a white margin, as in that bird. The deſcription was taken from a bird living in a menagerie.

Leucocephala. Bluiſh; orbits and crown white. *Columba leucocephala*, Linn. *Columba minor, capite albo*, Ray. *Columba ſaxatilis jamaicenſis, le pigeon de roche de la Jamaique*, Briſſ. *Bald-pate pigeon*, Sloane. *White crowned pigeon*, Arct. Zool.

Breeds in vaſt numbers among the rocks on the coaſts of Jamaica, St. Domingo, and the Bahama iſlands; and ſubſiſts on the berries of the ſweet wood. The length is ten inches and a half; the bill red with a white tip; the eyes ſurrounded with a white ſkin, the irides yellow; crown of the head white, beneath changeable; neck green and blue, varied with a gloſs of copper; the quill, feathers, and tail are brown; the legs red, with grey claws.

Leucoptera. Orbits naked, and blue; tail feather cinereous, with the tips white, the middle ones fuſcous. Linn. *Columba indica*, Briſſ. *Brown Indian dove*, Edwards. *White winged dove*, Brown. Jam.

This bird is the ſame ſize as the common turtle, and meaſures in length eight or nine inches. The bill is duſky black. A fine blue ſkin ſurrounds the eyes, and according to the figure in the plates of Edwards, goes on to the baſe of the upper mandible. The irides are crimſon; the forehead, cheeks, and front of the neck and breaſt, pale rufous brown; hind part of the head and neck dull brown. The upper part of the body is dark brown, with a mixture of blue; greater wing-coverts the ſame, but the outer margins, and tips are white. The two middle tail feathers, are the ſame colour as the back, the reſt dull aſh, with white tips; legs red, with black claws. The white winged dove, inhabits the Eaſt Indies, and is obſerved to flirt up its tail at intervals, like the common wagtail.

Fusca. Fuſcous; eyes black; neck and breaſt white, undulated with black. Jacq. Beytr.

This is the ſize of the turtle, and inhabits Carthagena, in America. Latham conſiders it as a variety of the laſt.

Martinica. Somewhat violaceous; abdomen reddiſh; quill feathers rufous on the inner webs. *Columba martinica*, Linn. *Columba violacea martinica*, Briſſ. *Pigeon violet de la martinique*, Buff. *Martinico pigeon*, Lath.

About the ſize of a turtle; the length nine inches and a quarter; the bill is red, and the eyes are ſurrounded with crimſon tubercles; the head, neck, and upper parts of the body, are cheſnut gloſſed with violet; the under parts of the body, more or leſs rufous; the quills the ſame as the upper, but on the outer edges only, the inner rufous; the tail feathers, the ſame on both margins; legs reddiſh with browniſh claws. Inhabits Martinico. *Le pigeon de la Martinique* of Briſſon, and which Buffon calls *Le pigeon roux de Cayenne*, is conſidered as a variety or rather the female of the above mentioned bird; it is of a reddiſh brown colour, with a collar of golden violet; the wings are ſpotted with black; lateral tail feather black at the end, with the tip white. Inhabits alſo Martinico.

JAMAICENSIS. Purpliſh brown, beneath white; tail feathers blue, terminated by a white line. *Columba jamaicenſis*, Linn. *Pigeon de la Jamaique*, Buff. *Columba minor ventre candido*, Raii. *White bellied pigeon*, Lath. *White bellied dove*, Sloane.

The length of this ſpecies is nine inches. The noſtrils are much elevated, and form two tubercles at the baſe; the top of the head, with the under parts of the neck and body are white; hind part of the neck varied with blue and purple; back, rump, and upper tail-coverts, purpliſh brown, with a light reddiſh tinge. This bird is found in the ſavannas of Jamaica, in the month of January. It feeds on berries, frequents trees, and has a mournful note, which is ſometimes very loud and diſagreeable.

CORONATA. Blueiſh, above cinereous; orbits black; creſt erect; ſhoulders ferruginous. Gmel. *Columba mugiens*, Scop. Ann. *Phaſianus criſtatus indicus*, Briſſ. *Faiſan couronné des Indes*, Buff. *Goura de la nouvelle Guinée*, Sonnerat. *Great crowned Indian pigeon*, Edwards.

The crowned pigeon is nearly the ſize of a turkey, in which particular, it far exceeds any other ſpecies of the ſame tribe. Briſſon has placed it with the pheaſants, and his example is followed in the *planches enluminées*, but the bird poſſeſſes in every reſpect, the manners of the pigeon tribe; its note is cooing and plaintive like thoſe birds, only louder in proportion. We are told, the mournful notes of theſe birds, alarmed the crew of Bougainville very much, when they touched in their voyage at one of the iſlands they inhabit, as they miſtook it at firſt for the cries of the human ſpecies. The crowned pigeon, we are aſſured by Scopoli, has been known to build its neſt and lay eggs in Europe, though the young were not hatched; they made a neſt on trees in the menagerie, where they were kept, compoſed of hay and ſtalks. The female it is obſerved never ſat, but ſtood upon the eggs, and it is ſuppoſed by Scopoli, that it muſt be from this cauſe alone, theſe eggs proved abortive. In the Eaſt Indies, they are occaſionally kept in court yards like other domeſtic poultry.

CRISTATA. Reddiſh brown, creſted; under ſide, head, and neck, black; back and tail green; front with ſix very long, erect feathers. *Columba criſtata*, Gmel. *Le zouloul de Malacca*, Sonnerat. *Uncommon bird from Malacca*, Phil. Tranſ. *Leſſer crowned pigeon*, Lath.

The bill of this ſpecies is conical and rather bent; the colour black, except the under mandible, which is yellow at the baſe. On the fore part of the head, are ſix very long black briſtly hairs, which ſtand upright, and may be depreſſed or elevated by the bird at pleaſure; on the back part of the head, is a creſt of a gilded red colour, compoſed of hard and ſtill feathers, The ſpace between the two creſts is white, forming a band acroſs the head. The eyes are encircled with ſtiff white feathers. The legs are yellow; the toes are ſeparated at their origin, and the hind claw is deſtitute of a claw. Size of the common pigeon. A variety of this bird, formerly in the Leverian Muſeum, meaſured ten inches in length: the bill was yellowiſh, with the tip black; the back part of the head, creſted as in the former; the forehead white, paſſing backwards on each ſide beneath the creſt; the eyes were ſurrounded with feathers of a reddiſh colour, which paſſed backwards in a point; the head and neck were dark reddiſh brown; breaſt, belly, and vent, violet black; wings fine reddiſh brown; back, rump, and tail, dull browniſh green; tail coverts long and falling over the tail; legs reddiſh yellow, with black claws. The hiſtory of this laſt bird is unknown, but it is conſidered as a variety, or perhaps a ſexual difference.

POMPADORA. Green; wings purpliſh, quills black; chin and throat yellow. Gmel. *Pompadour pigeon*, Lath. Gen. Syn. Brown. Illuſtr. *Yellow-faced pigeon*, Brown (fem).

The pompadour pigeon is a native of India, and appears to be moſt common in the iſland of Ceylon. It is conſtantly ſeen on trees, and for the moſt part on thoſe known by the name of *Waringin grothebria*, on the berries of which it delights to feed. They are ſhot by Europeans, who eſteem them excellent eating; the natives take them with bird-lime. The ſize is leſs than that of the common turtle; the back, breaſt, and belly, are pale green; the wing-coverts of a fine pompadour colour; tail green; and legs red. The female is paler, and has the wing-coverts the colour of the body. Thoſe birds are common in the country about Bengal, where they are called *coucla*; it is ſaid to have a whiſtling note, reſembling that of the thruſh.

ERYTHROPTERA. Black; eye-brows, and front white; neck above, ſhoulders and wing-coverts garnet colour; tail from the baſe to the middle cinereous; legs brown.

Length nine inches and a half; tail two inches and a half long and even at the tip; legs brown.

This inhabits the iſland of Eimeo. Another bird much reſembling this, and ſuppoſed to be the female, was met with at Otaheite; the forehead, throat, front of the neck and breaſt, were white, the hind part of the neck duſky; over the eye a ferruginous ſtreak, paſſing a little downwards on each ſide of the neck; the back duſky black; belly duſky; quills and tail blackiſh. Another analogous kind, found in the South Sea iſlands, is of a reddiſh black colour, with the breaſt, and eye-brows white, and the legs red.

ALBICAPILLA. Green; crown hoary; ſides of the neck cheſnut with a golden gloſs; greater quill feathers and tail black. *Columba albicapilla*, Gmel. *Le pigeon vert à tête griſe d'Antique*, Sonnerat. *Grey headed pigeon*, Lath.

A native of the iſle of Panay. Its ſize is equal to that of the common pigeon: the bill dull red with the irides yellow; the leſſer quill feathers are green, with a metallic luſtre, and on the arm-pits is a ſemi-circular ſpot, half grey, and half green; the legs are dull red.

INDICA. Body purple; ſhoulders green; cap blueiſh. *Columba indica*, Linn. *Palumbus amboinenſis*. *Le pigeon ramier d'amboine*, Briſſ. *Green winged pigeon*, Lath.

Size of the turtle; the bill ſcarlet and ten inches in length; noſtrils blueiſh; forehead white, with a ſtreak of the ſame through the eye. The ſides of the head, neck, and breaſt is reddiſh, the hind part deepeſt; upper part of the back and wing-coverts green gold, gloſſed with coppery; ridge of the wing ſpotted with white; lower part of the back, rump, and upper tail-coverts reddiſh brown; quills browniſh, and rufous next the baſe; tail three inches long; two middle tail feathers black; the reſt cinereous, with the tips black; legs red, with black claws. A native of Amboina. Jacquin deſcribes a variety of this bird, having the quills and tail feathers green; wing-coverts violet; and the rump and vent blue.

PURPURATA. Green; cap ſcarlet; vent fulvous; head, neck, and collar white. *Columba purpurata*, Gmel. *Purple-crowned pigeon*, Lath.

A general inhabitant of the iſlands in the Pacific ocean, and ſubject to conſiderable variations in the colour of its plumage. The natives of Tongo Taboo call it *kurukuru*, thoſe of Otaheite Oopa, and Oopara. It lives on the banana, and is eaſily tamed.

JAMBOS. Green; front red; breaſt white. *Columba jambu*, Gmel. *Pooni jamboo*, Marſd. *Jamboo pigeon*, Lath.

Rather ſmaller than the common dove; the bill is yellow, the fore part of the head of a deep pink, reſembling the colour of the bloſſoms of the jamboo, whence its name of jamboo pigeon; the back, wings, and tail are green, with the breaſt and crop white; the eyes are yellow, and from the orbits to the breaſt extends a white ſtreak, edged on one ſide with green, and on the other with pink. This is a native of Java, and feeds chiefly on berries.

RUBRICAPILLA. Violet-black; cap and orbits of the eye naked and red; neck, upper part of the back, and breaſt greyiſh. *Columba atricapilla*, Gmel. *Le pigeon violet à tête rouge d'Antique*, Sonn. *Red crowned pigeon*, Lath.

Found in the iſle of Panay by M. Sonnerat. This bird is the ſize of the jacobin pigeon. The bill is grey. At the baſe of the upper mandible is a fleſhy membrane of a bright red colour entirely encircling the eye; legs grey.

PURPUREA. Green; head and neck purpliſh; breaſt fulvous; vent ſcarlet. *Columba purpurea*, Gmel. *Purple pigeon*, Brown, Lath.

Size of the common wood-pigeon. The front is pale green; breaſt orange; back, ſcapulers, and belly light green; quills duſky. A native of Java where it is called *joan.*

EIMENSIS. Greeniſh brown; front, collar, and beneath vinaceous; crown and neck above brown; double band on the breaſt purple and white. *Columba eimenſis*, Gmel. *Purple breaſted pigeon*, Lath. Inhabits the iſland of Eimeo. Length fourteen inches.

VERNANS. Green, beneath yellow, outer margin of the wing pale yellow. *Columba vernans*, Linn. Gmel. *Le pigeon vert de Philippines*, Buff. *Columba madera ſpatana*, Raii Syn. *Le pigeon vert male de l'iſle de Luçon*, Sonnerat. *Parrot pigeon*, Lath.

Inhabits the iſlands of Manilla and Panay. The female is of a greeniſh-grey, and greeniſh yellow beneath. The ſpecies is rather larger than the turtle.

AROMATICA. Green-olive; back bay-colour; double bar on the wings yellowiſh and black; quill feathers black, with yellow edges. *Columba aromatica*, Gmel. *Columba viridis amboinenſis*, Briſſ. *Pigeon vert d'Amboine*, Buff. *Aromatic pigeon*, Lath.

Size of the common turtle; length ten inches and a half. The bill is greeniſh; crown grey; tail beneath black at the baſe, and at the tip whitiſh; legs grey or red. A native of Amboina.

ST. THOMAE. Green; vent yellow; bill curved, blue, and red at the baſe. *Columba viridis S. Thomæ*, Briſſ. *A wild pigeon from St. Thomas's iſland*, Will. Ray. *St. Thomas's pigeon*, Lath.

The ſize of the common pigeon; the eyes are black, ſurrounded by blue orbits, with the wings and tip of the tail brown. Inhabits the iſland of St. Thomas.

CURVIROSTRA. Green; beneath yellowiſh; vent white; back and ſhoulders bay; wings with two yellow bars; middle tail feathers green; lateral ones cinereous with a black band. *Columba curviroſtra*, Gmel. *Hook billed pigeon*, Lath.

Inhabits the iſle of Tanna in the South Seas; the bird, ſuppoſed to be the female of this ſpecies, differs from the male in having the back and ſhoulders green, and the under tail-coverts, together with the vent white.

TANNENSIS. Green; wing-coverts ſpotted with white; ſecondary quill feathers edged with yellow at the tip. Lath.

Deſcribed from a drawing in the poſſeſſion of ſir Joſeph Banks. The bird is eleven inches in length, and inhabits the iſle of Tanna. This is, perhaps, only a variety of the laſt.

CYANOCEPHALA. Vinaceous-brown; head and throat blue, with a white band between the eyes. *Columba cyanocephala*, Linn, *Turtur jamaicenſis*, Briſſ. *Tourtelle de la Jamaique*, Buff. *Turtle dove from Jamaica*, Albin. *Blue-headed turtle*, Lath.

A native of the iſland of Jamaica, Cuba, and other warm parts of America. Size of the common pigeon.

PACIFICA. Back greeniſh brown; head, neck, breaſt, and abdomen cinereous white; tail blackiſh. *Columba pacifica*, Gmel. *Ferruginous vented pigeon*, Lath.

The length of this ſpecies is thirteen inches and a half; the noſtrils are gibbous, the throat whitiſh; breaſt vinaceous, and the legs either red or brown. It is a native of the Friendly Iſlands. A variety of this ſpecies has the head, neck, breaſt, and belly whitiſh; back, wing-coverts, and tail greeniſh, and the bill gibbous at the baſe. This inhabits Otaheite and Tongataboo.

MEXICANA. Fuſcous, orbits ſcarlet; breaſt and tip of the wings white. *Columba mexicana*, Briſſ. *Pigeon du Mexique*, Buff. *Ceboilolt*, Ray. *Mexican pigeon*, Lath.

A native of Mexico; the irides are black; the legs red.

NAEVIA. Above fuſcous, ſpotted with black; beneath pale fulvous; under tail-coverts, and beneath the wings, cinereous. *Columba naevia*, Gmel. *Oenas mexicana*, Briſſ. *Hoilotl*, Ray. *Black ſpotted pigeon*, Lath.

Inhabits the ſame country as the laſt, and frequents woods; ſize of the common pigeon.

HOILOTL. Rufous purple; leſſer wing-coverts white; bill and legs ſcarlet. *Columba hoilotl*, Gmel. *Columba montana Mexicana*. Briſſ. *Hoilotl*, Ray. *White-ſhouldered pigeon*, Lath. Inhabits the mountainous parts of Mexico.

CAERULEA. Blue; beneath, bill, legs, and wing-coverts red. *Columba caerulea*, Gmel. *Columba caerulea mexicana*, Briſſ. . *Flacahoilotl*, Ray. *Blue pigeon*, Lath.

Size of the domeſtic pigeon; and an inhabitant of Mexico.

PALUMBUS. Cinereous: tail feathers black on the poſterior part; primary quill feathers whitiſh on the outer edge; neck on each ſide white. *Columba palumbus*, Linn. *Le pigeon ramier*, Buff. *Colombo ſaſſaiuolo*, Cetti. *Ringel tauben*, Gunth. *Ring pigeon*, Lath.

Inhabits the woods of Europe and Siberia, and builds its neſts on trees.

ÆNEA. Legs feathered halfway down; beak and legs greeniſh; body braſſy. *Columba ænea*, Linn. *Palumbus moluccenſis*, Briſſ. *Pigeon ramier des moluques*, Buff. *Nutmeg pigeon*, Lath.

Inhabits the Molucca iſlands, and feeds on the nutmeg: its ſize is equal to that of the ring-pigeon. A variety of this ſpecies is deſcribed by Sonnerat, under the title of *Pigeon cuivre mangeur de muſcade*, and which appears to have been found in New Zealand; another variety has been met with at Amſterdam iſland, where it is called *Orooba ya*.

ALBA. Body white; primary quill-feathers and tip of the tail black. *Columba alba*, Gmel. *Le pigeon blanc mangeur de muſcade*, Sonner. Voy. *White nutmeg-pigeon*, Lath.

This bird inhabits New Guinea, and is deſcribed by Sonnerat, who mentions its feeding on nutmegs, obſerving, that it is probably only the outer ſkin which ſerves them for nouriſhment, as the nut itſelf is voided whole, and ſo little altered, that, after paſſing through the organs of digeſtion, it is not rendered leſs fit for vegetation; and hence it happens, that thoſe birds flying from one iſland to another, diſperſe, and ſow the ſeeds of thoſe valuable plants in every part they frequent. A variety of this ſpecies having the tail white inſtead of black.

GUINEA. Orbits naked and rufous; wings ſpotted with triangular ſpots of white; tail-feathers black at the tip. *Columba guinea*, Linn. Gmel. *Pigeon de guinée*, Buff. *Le tourterelle du cap de bon eſpérance*, Sonner. *Triangular ſpotted pigeon*, Edwards, Lath.

Inhabits the rocky parts of Africa, and is in particular common about the Cape of Good Hope. The ſize is that of the wood-pigeon; its bill is brown, irides yellow; head and neck cinereous, upper parts gloſſed with violet and purple; rump and belly white.

CARIBÆA. Blueiſh; abdomen white; head, lower part of the neck, and breaſt purpliſh; tail faſciated tranſverſely with black. *Columba caribæa*, Gmel. *Columba cauda faſcia notata*, Ray. *Ring-tail pigeon*, Lath.

A bird the ſize of the ring-pigeon, and which is found in all the woods of the Caribbee iſlands. It is in great eſteem for food, each bird ſelling for the table at the price of a dollar. In Jamaica it is frequently called the mountain pigeon. A ſuppoſed variety of this bird is deſcribed by Jacquin, which has the tail cuneated, the orbits bare of feathers, and yellowiſh, and the body blueiſh; the tail of the laſt-mentioned bird is as long as the body, and is deſtitute of the black band ſo conſpicuous in the ring-tail pigeon. We conceive this ought ſcarcely to be conſidered as a mere variety.

ZEALANDICA. Red; abdomen white; rump blue; tail black. *Columba novæ ſeelandiæ*, Gmel. *New Zealand pigeon*, Lath.

A native of New Zealand, obſerved by the Engliſh circumnavigators, in Duſky bay, where the inhabitants call it *Hagarrèroo*. The length of this bird is eighteen inches. The bill and irides are red; quill-feathers duſky; vent blueiſh.

BRUNNEA. Cap, neck above, back, and wing-coverts brown; breaſt, neck beneath, and the rump ſhining green. Lath. Inhabits New Zealand; the bill and legs are ſanguineous.

CHALCOPTERA. Brown-cinereous, edged with rufous; front and chin white; a bifid copper-gold band acroſs the wing, and a black one near the tip of the tail. *Columba chalcoptera*, Lath. Ind. Orn. *Bronze-winged pigeon*, Phil. Bot. Bay.

This beautiful bird is a ſpecies recently diſcovered, and was firſt deſcribed by governor Phillips, in his account of Botany bay. It is the ſize of the common wild pigeon, and appears to be found chiefly in Norfolk iſland. The moſt remarkable character of the bird is the rich band of coppery-gold acroſs the wings; a few ſpots of the ſame colour occurs alſo on the leſſer wing-coverts. Its bill and legs are red; quill-feathers brown, beneath rufous; the two middle tail-feathers brown, the reſt pale lead colour.

MADAGASCARIENSIS. Legs feathered; tail violaceous; body blue-black. *Columba madagaſcarienſis*, Linn. *Le founingo*, Buff. *Pigeon ramier bleu de madagaſcar*, Pl. Enl. *Madagaſcar pigeon*, Lath.

The length of this ſpecies is ten inches and a half; its ſize that of the common pigeon. The bill and legs are red; the eyes placed in a bare reddiſh ſkin; the feathers on the neck are narrower than the others, and have a mixture of aſh.

AUSTRALIS. Green; abdomen, vent, and thighs ſpotted; ſhoulders violet. *Columba auſtralis*, Linn. *Palumbus viridis madagaſcarenſis*, Briſſ. *Pigeon ramier verd de madagaſcar*, Buff. *Madagaſcar pigeon*, Lath.

A native of Madagaſcar. Length twelve inches; bill lead colour; eyes and legs ſanguineous; poſterior part of the abdomen and thighs ſpotted with black. Perhaps a variety of the laſt.

FRANCIÆ. Blue; orbits naked; rump and tail red; feathers of the neck long, narrow, and pointed at the end. *Columba franciæ*, Gmel. *Le pigeon hollandais*, Sonnerat. *Hackled pigeon*, Lath.

This bird conſiderably exceeds the ring-pigeon in point of ſize. The bill and irides are crimſon; the feathers of the head, neck, and breaſt are long, narrow, pointed, of compact texture, and with a highly poliſhed ſurface. It inhabits the iſle of France, and is never eaten, the fleſh being reputed poiſonous.

MACULATA. Deep green; body above ſpotted with whitiſh; belly blackiſh; tail black, with the tip ferruginous. *Columba maculata*, Gmel. *Spotted green pigeon*, Lath.

Deſcribed by Dr. Latham from two ſpecimens, one in the collection of general Davies, the other in that of ſir Joſeph Banks. The length is twelve inches. The bill black, with the tip yellow; the general colour is dark green, with a gloſſy ſurface; the head and neck darker than the reſt. The feathers of the neck are long and narrow; every feather of the wings and ſcapulars are marked with a pale cinereous-white, and ſub-triangular ſpot; the quill-feathers are black, with the tip cinereous; the legs are brown, and are covered half way down with downy feathers. The native place of this ſpecies is unknown.

NICOBARICA. Tail white; body black; wings blue; back ſhining green; feathers of the neck long. *Columba nicobarica*, Linn. Gmel. *Pigeon de nincombar*, Buff. *Nicobar pigeon*, Albin.

This is one of the moſt ſplendid of the pigeon tribe. Its ſize is that of the common pigeon; the bill is duſky; the irides hazel; head, neck, breaſt, belly, and thighs, and under tail-coverts dark blueiſh-purple; the feathers on the neck are long and pointed, and with the upper parts of the wings are of the fineſt green colour, gloſſed with the moſt vivid hues of red, blue, copper, or golden. The tail and upper coverts are white; legs reddiſh. The female is diſtinguiſhed by the plumage being leſs brilliant and gloſſy, and in having the pointed feathers of the neck ſhorter than in the male. Thoſe birds inhabit the iſle of Nicobar.

SPECIOSA. Ferruginous; tail blackiſh; neck and breaſt varied with rufous, white, and purple undulations. *Columba ſpecioſa*, Gmel. *Le pigeon ramier de Cayenne*, Buff. *Le ramiret*, Ib. *Scallop-necked pigeon*, Lath.

Rather larger than the common turtle. The bill is red, covered with a white cere; the head ferruginous; neck and breaſt varied with rufous white and purple, each feather being rufous, with a white mark, and the margin blue, gives the whole plumage in this part a beautiful undulated appearance; the back and wings are ferruginous; quills darker than the reſt; tail duſky black, and rounded; the legs red. The female is marked in the ſame manner as the male, but is much duller in colour. A native of Cayenne.

TURTUR. Tail-feathers white at the tip; black grey breaſt fleſh-colour; on each ſide of the neck a patch of black feathers, white at the tip. *Columba turtur*, Linn. *Turtur auritus*, Ray. *Palumbus turtur*, Klein. *Tourterelle*, Buff. *Tortora*, Zinnan. *Common turtle*, Penn.

The turtle is a general inhabitant of Europe, China, and India, and appears to be moſt frequent in Turkey and the ſouthern parts of Ruſſia, and in the rocky country beyond the lake Baikal. In England thoſe birds are not uncommon during the ſummer, but it is only in this ſeaſon that they are obſerved with us, for they arrive late in the ſpring, and depart in autumn. They build on the higheſt trees in thick and deep foreſts, and lay two eggs like the other kinds of pigeons.

It is related by baron de Tott, that this bird is highly favoured in the Turkiſh dominions, where it is extremely plentiful, government allowing a certain rate per cent. on the duty impoſed on corn that thoſe birds may be allowed to feed unmoleſted. A crowd of them conſtantly alight on the veſſels which croſs the port of Conſtantinople, and carry the corn uncovered either to the mills or magazine, and the boat-men never oppoſe them. This permiſſion to feaſt on the grain brings them in great numbers, and familiarizes them to ſuch a degree, that they are ſeen ſtanding on the ſhoulders of the rowers watching for a vacant place where they might fill their crops in turn. The ſame cuſtom is mentioned by Sonnini.

"In the Leverian Muſeum (ſays Dr. Latham) is a bird ſhot in Buckinghamſhire, which differs from the common turtle in having almoſt the whole ſide of the neck black, inſtead of a patch only, and inſtead of each feather being tipped with white, there is a round ſpot of white on each very near the end, giving the ſides of the neck a moſt beautiful appearance." There were three of thoſe elegant birds in the Leverian Muſeum, including the male, female, and young, all which are now preſerved in the London Muſeum. Thoſe we are perſuaded ought rather to be conſidered as a diſtinct ſpecies than a variety of the turtle. Two others, conſidered as varieties of this bird, are the Portugal dove of Albin, and *La tourterelle griſe de l'iſle de luçon* of Sonnerat, the firſt inhabits Portugal, as its name implies, and is of a brown colour, with the ſpot on the ſide of the neck varied with black and white, and the lateral tail feather on the outer ſide tipped with white; the other is diſtinguiſhed principally by having the two middle tail-feathers black, and the lateral ones white. This inhabits Manilla. Beſides the above Dr. Latham deſcribes *La tourterelle brune de la Chine* of Sonnerat as a further variety of this bird in his "Synopſis," but in the "Index Ornithologicus," it is enumerated as a ſpecies under the name of *orientalis*.

ORIENTALIS. Griſeous brown; feathers on the ſides of the neck black, with pale cinereous tips; band on the wings yellow. *Chineſe turtle,* Lath.

A native of China, and of the ſize of the common turtle; the bill and irides are red; head, neck, breaſt, and back dirty browniſh grey, paleſt on the breaſt; wings brown; rump and tail deep cinereous grey; belly and thighs vinous grey; legs red.

ÆGYPTIACA. Teſtaceous-fleſh colour; chin ſpotted; the feathers black, and two lobed, truncated and ferruginous at the tip. Forſk. Fn. Arab.

This bird is deſcribed by Forſkal, who informs us it frequents houſes in Egypt; the bill is black; head violet and fleſh-colour; orbits naked and blueiſh; back cinereous; breaſt violaceous fleſh-colour; belly and thighs whitiſh; wings brown; the two outermoſt tail feathers cinereous at the baſe, black in the middle, and the remainder white; the two next on each ſide cinereous at the baſe, black in the middle, cinereous beneath, and whitiſh at the tips, the fifth on each ſide brown, in the middle pale black, the two middle ones wholly brown; legs fleſh-colour.

SURINAMENSIS. Cinereous, beneath white; chin varied with black and green; bill blue. *Columba ſurinamenſis,* Gmel. *La tourterelle,* Sonnerat. *Surinam turtle,* Lath.

Length ten inches; the bill long and ſlender, of a fine deep blue without, and red within; and the legs red. The ſpecies is thus deſcribed by Fermin, who informs us it is a common bird in Surinam. It lays eggs twice in a year, making its neſt in woods on the higheſt trees; the fleſh is juicy and delicious.

RISORIA. Above yellowiſh, beneath white, with a black creſcent on the back of the neck. *Columba riſoria,* Linn. *Turtur torquatus,* Briſſ. *Turtur indicus,* Aldr. *La tourterelle à collier,* Buff. *Indian turtle,* Albin. *Collared turtle,* Lath.

Exceeds ten inches in length; the female differs from the male in having the colours leſs vivid, and inclining to grey. Inhabits India, and the ſouthern parts of Europe.

La tourterelle griſe de la Chine of Sonnerat is conſidered as a variety of this bird; it is of a brown colour, beneath vinaceous grey; crown grey; black creſcent on the neck, above ſpotted with white; lateral tail-feathers black, ſpotted with white. This kind inhabits China and Madras.

La tourterelle mulet, turtur hybridus of Briſſ. is alſo of this ſpecies; or, at leaſt, a mixed breed between the common and collared turtles. The head, neck, and breaſt are vinaceous; the back dull reddiſh aſh-colour; belly, beneath the wings, and tip of the tail as in the laſt mentioned bird; the quills are brown; legs ſanguineous.

SINICA. Fuſcous, faſciated with black; abdomen ſomewhat ſanguineous; wings and bill black. *Columba ſinica,* Linn. *Turtur ſinenſis ſtriatus,* Briſſ. *Tourterelle rayée de la Chine,* Buff. *Dove* from China, Albin. *Striated turtle,* Lath.

This is a native of China, and is the ſize of the laſt. The bill is blueiſh aſh-colour; the irides white; crown of the head aſh colour; tail paliſh brown; legs red, and claws white.

STRIATA. Orbits and lores white; body cinereous, faſciated with black; beneath rufous. *Columba ſtriata,* Linn. *Turtur indicus ſtriatus,* Briſſ. *Tourterelle rayée des Indes,* Buff. *Barred turtle,* Lath.

Length nine inches and a half; the bill three quarters of an inch long, and of a pale horn colour; the noſtrils pale blue; irides blue grey. The eyes are placed in a bare white ſkin, which paſſes to the noſtrils; forehead, cheeks, and throat pale blue; top of the head and hind head incline to rufous; upper part of the neck, the back, and wing-coverts are browniſh aſh marked with tranſverſe arcuated black bands; ſides of the neck and body blueiſh, croſſed with blue, black, tranſverſe ſlender lines; fore part of the neck, breaſt, belly, and thighs tinged with roſe-colour; under tail-coverts white; legs pale red; claws brown.

This bird is frequent at Malacca and the iſland of St. Helena; and is alſo found, according to Jacquin, in South America.

SURATENSIS. Griſeous; neck above black; hind head white; nape banded with rufous; quill-feathers black; back, rump, and tail obſcure grey. *Columba ſuratenſis,* Gmel. *La tourterelle de Surate,* Sonner.

About ten inches in length. The bill is black; the irides and legs red. It is a native of Surat in the Eaſt Indies.

CAMBAYENSIS. Grey, beneath white; head ſomewhat vinaceous; collar beneath black, varied with rufous; lateral tail-feathers half black and half grey. *Columba cambayenſis,* Gmel. *La tourterelle griſe de Surate,* Sonner. *Cambayan turtle,* Lath.

Deſcribed after Sonnerat as a native of Surat, and other provinces of Cambaya. Its ſize is that of the collared turtle.

VIRIDIS. Braſſy, fore part of the neck purple-violet. *Columba viridis,* Linn. *Turtur viridis amboinenſis,* Briſſ.

Le turvert, Buff. *La tourterelle à gorge pourprée d'amboine*, Pl. Enl. *Green turtle*, Lath.

The length of this bird is ſeven inches and three quarters. The bill is red; fore part of the head and throat aſh-colour; the hind head and back part of the neck, back, rump, upper tail and wing-coverts, breaſt, belly, ſides, and thighs green gold, gloſſed with copper; the greater wing-coverts have the outer edges of the feathers at the tip ſulphur-coloured; under wing-coverts aſh, quills blackiſh; tail blue-green, gloſſed with copper; the legs are red, and covered half their length with feathers; the claws grey-brown. This bird inhabits Amboina.

MALABARICA. Cinereous, beneath white; middle wing-coverts with oval ſpots; lateral tail-feather black two-thirds their length from the baſe, the remaining part white. *Columba malabarica*, Gmel. *Tourterelle de la cote de malabar*, Sonner. *Malabar turtle*, Lath.

A ſpecies the ſize of the laſt, and alſo deſcribed by Sonnerat. It inhabits the coaſt of Malabar. The bill and irides are red; the head, back, and wings are of a pale cinereous-grey; the neck and breaſt grey, tinged with vinaceous; the two middle tail-feathers grey; the belly white; and legs red.

MELANOCEPHALA. Green; head ſomewhat cinereous; head blueiſh-aſh; hind head black; chin and throat yellow; vent orange; ſix middle-tail-feathers green; the outer ones on each ſide fine crimſon. *Columba melanocephala*, Zool. Ind. *Turvert*. Buff. *Tourterelle de Batavia*, Pl. Enl. *Black-capped pigeon*, Ind. Zool.

Found in the iſland of Java. The length is nine inches and a half; the bill black, ſhort, and yellow at the tip; the tail is of a ſomewhat cuneated form; and the legs are black.

JAVANICA. Green; head and neck vinaceous red; abdomen duſky; primary quill-feathers fuſcous. *Columba javanica*, Gmel. *Le turvert*, Buff. *La tourterelle de java*, Buff. Pl. Enl. *Javan turtle*, Lath.

Length nine inches; the bill pale red; covered with a white cere; tail duſky beneath; legs red. Inhabits Java.

CÆRULEOCEPHALA. Green, beneath red; crown blue; wings and tail black-blue. *Columba cæruleocephala*, Lath. *Columba cyanocephala*, Gmel. *Blue-crowned turtle*, Lath. Syn.

Size of the laſt; it is an inhabitant of China, where it is called by the natives *Taupaun*. Common alſo in the iſland of Cuba, where it is caught in traps, and brought to the markets in great numbers as an article of proviſion.

AFRA. Griſeous brown, beneath whitiſh; exterior tail-feathers, at the outer baſe, and the ſpot at the tip white; wing-coverts with violet-azure ſpots. *Columba afra*, Linn. Gmel. *La tourterelle du ſenegal*, Briſſ.

The length of this bird is eight inches. The bill is reddiſh; top of the head aſh-coloured; hind part of the neck, back, wing-coverts, and rump grey-brown; throat whitiſh; fore part of the neck and breaſt pale vinaceous; the belly, ſides, thighs, and under tail-coverts dirty white; the upper tail-coverts are grey-brown, with the tips blackiſh; quills brown, with the inner webs rufous; on the wings are ſome ſpots of green gold-colour, gloſſed with violet; the tail is two inches and three quarters in length; the two middle tail-feathers blackiſh-brown, the reſt grey-brown, with the ends blackiſh; the legs are red, with brown claws. This is a native of Senegal, and is the *Columba ſenegalenſis* of Briſſon, but not of Linnæus; the latter writer deſcribes the next ſpecies under that name.

SENEGALENSIS. Reddiſh-brown, beneath white; neck beneath ſpotted with black; three outer tail-feathers white on the lower half. *Columba ſenegalenſis*, Linn. *Turtur gutture maculato ſenegalenſis*, Briſſ. *Tourterelle à gorge tachetée du ſenegal*, Buff. *Senegal turtle*, Lath.

The length of this ſpecies is nearly ten inches; the bill is blackiſh, the head, neck, and breaſt vinaceous; upper part of the back brown, lower cinereous; the ſix middle feathers cinereous brown; the three others on each ſide dark-aſh from the baſe to the middle, and from thence to the ends white; beneath the colours are half aſh, and half black in the ſix middle feathers, and white in the three outer ones; the legs are red, the claws brown. This bird is found chiefly near the river Senegal.

VINACEA. Grey-brown, beneath white; on the upper part of the neck a black collar; wings fuſcous, with the outer margin of the feathers whitiſh. *Columba vinacea*, Gmel. *Turtur torquatus ſenegalenſis*, Briſſ. *Tourterelle à collier du ſenegal*, Buff. *Collared ſenegal turtle*, Lath.

Size of the laſt, and inhabits the ſame country. The bill is blackiſh; head, neck, and breaſt claret-colour; upper part of the back brown, lower cinereous; belly white; ſix middle tail-feathers aſh-coloured-brown; beneath from the baſe to the middle black, the reſt cinereous.

CRUENTA. Grey; neck beneath white; nape violet; three greyiſh bands acroſs the wings; on the breaſt a ſanguineous ſpot. *Columba cruenta*, Gmel. *La tourterelle griſe enſanglantée*, Sonner. *Red-breaſted turtle*, Lath.

Firſt deſcribed by Sonnerat; it inhabits Manilla. The length of this bird is eight inches; the bill is black; the irides ferruginous; collar on the neck violet, gloſſed with green; the blood-coloured ſpot on the breaſt darkeſt in the middle; wings with three grey and two black tranſverſe bands; quill-feathers black; tail grey at the baſe, and black at the end; legs blackiſh, and ſomewhat violet.

SANGUINEA. Body entirely white; ſpot on the breaſt, the bill and legs ſanguineous. *Columba ſanguinea*, Gmel. *Tourterelle blanche enſanglantée*, Sonner. *Sanguine turtle*, Lath.

This bird inhabits Manilla, and was firſt deſcribed by Sonnerat. It is a ſpecies of great ſingularity, the whole of the plumage being white, except the ſpot on the breaſt, which is of a deep ſanguineous colour; the bill and legs are red, the irides purpliſh.

PASSERINA. Wings and tail duſky; body purpliſh; bill and legs yellow. *Columba paſſerina*, Linn. Gmel. *Turtur parvus americanus*, Briſſ. *Columbus minimus*, Klein. *Turtur indicus*, or *Cocotzin*, Ray. *Cocotzin*, Buff. *Les petites tourterelles*, Pl. Enl. *Ground dove*, Cateſby.

The ground dove is a native of the warmer parts of America, and the contiguous iſlands; and is obſerved as far north as Carolina, but more rarely. Willughby ſays it is very common in Mexico, where it inhabits mountainous places. Bancroft obſerves, that it is the only kind of dove met with at Guiana. In the Caribbee iſlands it is very abundant, and is commonly eaten, being in much eſteem for food; its haunts are ſtony places under buſhes. It is alſo common in Jamaica, where, as Sloane mentions, "they feed on the ground like partridges, and ſpring as they do, riſing and flying for a ſhort flight, and then light again on the ground." They ſubſiſt chiefly on grain and ſeeds of vegetables; and are taken in traps baited with the ſeeds of the *Ricinus*, or wild caſſada.

This is a ſmall and elegant ſpecies, the length about ſix inches. The bill is pale red, with the tip blackiſh; the irides orange; upper part of the head and neck aſh-colour; back, rump, and upper tail-coverts the ſame, but deeper; front vinaceous; throat and breaſt ſpotted with brown; two middle tail-feathers are deep aſh-colour; the others blackiſh;

legs red, the claws blackiſh. The female differs in the general colour of the plumage being paler.

There are ſeveral varieties of this ſpecies, one of which, found at Carthagena in South America, is diſtinguiſhed by having fewer brown ſpots than uſual; another has the body more inclining to reddiſh, and the eyes cheſnut; and a third with the feathers of the neck and breaſt of many colours.

MINUTA. Brown; wings with from five to ſeven ſteel-blue ſpots; outermoſt tail-feathers white at the tip. *Columba minuta*, Linn. *Turtur parvus fuſcus americanus*, Briſſ. *Cocotzin aliud genus, tlapalcocotli*, Will. *Paſſerine turtle*, Lath.

It admits of ſome doubt whether this pigeon is diſtinct from the laſt, C. paſſerina. This kind inhabits America, and is five inches and a half in length. The upper parts of the body are brown, the under more or leſs rufous-white; wing-coverts rufous; two middle tail-feathers brown, the others aſh-coloured at the baſe, black in the middle, and brown at the tip; the bill and legs are black.

MALACCENSIS. Undulated with black lines; above cinereous-grey; beneath cinereous; ſides of the neck white; tail-feathers fuſcous, ſides near the tips white. *Columba malaccenſis*, Gmel. *La petite tourterelle de queda*, Sonner. *Malacca turtle*, Lath.

This is a beautiful ſpecies, ſcarcely exceeding the ſize of the common houſe-ſparrow; the bill is yellow, and in the middle black; the forehead and throat are light cinereous-grey; breaſt and belly vinaceous-grey; middle tail-feathers brown for two-thirds of their length, and from thence to the end white; thighs and under tail-coverts white; legs yellow. This ſpecies inhabits Malacca, and is eſteemed a delicacy for the table.

VERNANS. Green; beneath yellowiſh; outer edges of the wings pale-yellow. *Columba viridis philippinenſis*, Briſ. *Pigeon vert des philippines*, Buff. *Columba vernans*, Gmel.

A native of the Philippine iſlands; the bill and legs are red, the breaſt azure.

Section ** *Tail long and cuneated, or wedge-form.*

MIGRATORIA. Orbits naked and ſanguineous; body cinereous; breaſt rufous. *Columba migratoria*, Linn. Borowſk. *Ænas Americana*, Briſ. *Palumbus caroliniensſis*, Klein. *Pigeon de paſſage*, Buff. *Paſſenger or migratory pigeon*, Phil. Tranſ. Kalm, &c.

Thoſe birds inhabit North America, paſſing the ſummer in the higher latitudes, and retiring to the more ſouthern provinces at the approach of winter. They build in trees, and lay two eggs. It is ſaid thoſe pigeons are ſo abundant in America, that at the period of their migration they are ſeen paſſing from one place to another in flocks of two or three miles in length, and a quarter of a mile in breadth, and which literally darken the air as they proceed. Frequently at ſuch times we are told they alight on trees, and ſometimes in ſuch immenſe numbers as to break down pretty ſtrong branches. They are eſteemed excellent eating, and, during the time of migration, furniſh the common people of America with abundance of food. About Philadelphia they ſhoot theſe birds from the tops of their houſes, or knock them down in the evening from their rooſting places. In Louiſiana they adopt another mode of capture: a party of five or ſix go in the evening into the wood; and taking with them ſeveral diſhes, or other flat veſſels, they ſet brimſtone on fire in theſe under ſuch trees as the birds commonly prefer to rooſt upon, the ſmoke and vapour of which aſcending ſo ſtupefy the birds that they drop down from their reſting places, and are picked up and ſecured in ſacks previouſly provided for that purpoſe. It is ſaid ſuch parties are often accompanied in thoſe nocturnal rambles by the ladies; this mode of taking pigeons being eſteemed a delightful evening's amuſement. The chief food of theſe birds are acorns, rice, corn, and other grain.

The paſſenger, or migratory pigeon of America, is about the ſize of the common domeſtic pigeon of this country. The bill is black, the ſpace round the eyes crimſon; irides orange; head, throat, and hind part of the neck, back, rump, and upper tail-coverts cinereous; wing-coverts the ſame, marked with duſky or black ſpots; the ſides of the neck are gloſſy, variable purple; fore part of the neck vinaceous; belly, ſides, and thighs, with the under tail-coverts, the ſame colour; paler, quills black-brown, edged with white; the tail rather long, with the two middle feathers blackiſh brown, the reſt hoary; legs red, with black claws.

A variety of this ſpecies is deſcribed by Gmelin. The colour is browniſh above, beneath whitiſh-rufous; neck on the forepart ſomewhat vinaceous; lateral tail feathers with a round black ſpot in the middle on the under ſurface.

CAROLINENSIS. Body rufo-cinereous, beneath reddiſh; orbits blue. *Columba carolinenſis*, Linn. *Turtur carolinenſis*, Briſ. *Picacuroba*, Will. *Tourterelle de la Caroline*, Buff. Pl. Enl. *Carolina pigeon*, Arct. Zool. Lath.

Rather larger than the common turtle. The bill is blackiſh; irides black; front, throat, and breaſt rufous, with a green-gold and violet gloſs. The hind part of the head and neck are browniſh aſh; the back, rump, upper tail, and wing-coverts aſh-brown; on the wings, near the tip of the greater coverts, are a few black ſpots; quills blackiſh aſh with whitiſh edges; tail-feathers unequal, the two middle ones four inches and an half in length; the outer ones very ſhort; the two middle ones entirely aſh-coloured brown; the next two on each ſide aſh-coloured, marked with black in the middle, the others light aſh-colour, whitiſh at the end, with a black ſpot between the two colours; the legs are red, the claws black. The female is deſtitute of the gloſſy violet colour on the breaſt. Thoſe birds inhabit Carolina, Braſil, and St. Domingo.

CANADENSIS. Body grey-brown, beneath whitiſh; primary quill feathers yellowiſh at the tip; tail feathers white at the apex. *Columba canadenſis*, Linn. *Tourterelle de Canada*, Buff. *Canada turtle*, Arct. Zool.

Length thirteen inches; the bill blackiſh; upper part of the head, neck, back, and wings grey-brown; the lower part of the back, rump, and upper tail-coverts aſh-coloured; throat and fore part of the neck grey-brown tinged with yellowiſh; wing-coverts marked with blackiſh brown ſpots; tail aſh-coloured, the feathers tipped with white, except the two middle ones; legs red; claws black. In the female moſt of the feathers are tipped with dirty white, which gives the plumage a ſtriated appearance. The native place is Canada.

MARGINATA. Body above fuſcous; beneath brown-grey; breaſt red; tail feathers black at the tip, the edges white. *Columba marginata*, Linn. *Turtur Americanus*, Briſ. *Tourterelle d'Amerique*, Buff. *Long tailed dove*, Edw. *Marginated pigeon*, Lath.

Inhabits America. Length ten inches; the bill is horny; irides rufous; lores white; front and chin reddiſh brown; hind head blueiſh aſh; under the ears a black ſpot; upper part of the body brown; ſhoulders ſpotted with black; throat roſy; two middle tail feathers blackiſh, the reſt cinereous.

AMBOINENSIS. Body rufous; neck waved with black. *Columba amboinenſis*, Linn. *La tourterelle d'Amboine*, Buff. *Amboina turtle*, Lath.

Length fourteen inches; bill black; feathers of the crown, neck, and breaſt with a blackiſh tranſverſe bar near the tip; feathers of the upper part of the back, and wing-coverts brown tipped with rufous; wings brown; tail reddiſh-brown. A native of Amboina.

CAPENSIS. Body grey-brown, beneath white; primary quill feathers rufous on the inſide. *Columba capenſis*, Linn. *La tourterelle*, Buff. *Cape pigeon*, Lath.

Inhabits the ſouthern parts of Africa. The length of this bird is nine inches and a half; the bill is red; body grey-brown; belly whitiſh; ſpot on the wing ſteely; ſecondary quill feathers brown, with the exterior edge grey; tail black beneath; lateral feathers at the baſe grey-brown, with the tips blackiſh; legs red, with the claws black. The female differs in having the throat and fore-part of the neck of the ſame colour as the reſt of the head, and the greater wing-coverts not tipped with black. There are ſeveral varieties of the cape pigeon.

MACROURA. Body cinnamon coloured, beneath whitiſh; tail whitiſh at the tip. *Columba macroura*, Gmel. *Le tourocco*, Buff. *La tourterelle à large queue*, Pl. Enl. *Great tailed pigeon*, Lath.

The length of this bird is twelve inches, the bill red, with a white cere; tail as long as the body; legs red. A native of Senegal.

BANTAMENSIS. Orbits naked and fleſhy coloured; neck, breaſt, and flanks waved with black and white. *Columba bantamenſis*, Muſ. Curſ. f. 3. t. 67.

Common in the iſland of Java. The ſpecies is ſmall, being about the ſize of the wry neck; the bill is black; body above hoary aſh; beneath whitiſh; back, wings, and breaſt with lunate black ſpots; tail ſame length as the body, and conſiſting of fourteen feathers, the ſix middle of which are black, the reſt white towards the tip; legs red.

MELANOPTERA. Body livid or blueiſh; wings black. Molin. Gmel. Deſcribed as a native of Chili. Vide Molin. Hiſt. Chili.

DOMINICENSIS. Body grey; ſides of the head and collar beneath the nape white; ſpot on the crown; band under the eyes, and collar on the neck black. *Tourterelle de St. Domingue*, Pl. Enl. *Columba dominicenſis*, Lath. Ind. Orn.

A native of St. Domingo; the length of this bird is eleven inches; the bill black; wings with a few blackiſh ſpots; breaſt vinaceous; front, chin, and vent white; tail grey; the outermoſt feathers white; legs red.

COLUMBA *groenlandica*, a name given by authors, as Ray, Willughby, and Albin, to the black guillemot. See COLYMBUS *grylle*.

COLUMBA is alſo the name of a military order inſtituted by John I. of Caſtile, about the year 1739.

COLUMBA *Noachi*, a ſmall conſtellation in the ſouthern hemiſphere, conſiſting of ten ſtars. The longitudes, latitudes, &c. of which are given in Sharp's Catalogue.

COLUMBAC denotes that part of the agallochum, which is between the heart, and that part next to the bark.

COLUMBARIA, in *Ancient Geography*, an iſland of the Mediterranean on the coaſt of Etruria, according to Pliny. —Alſo, another iſland of the Mediterranean, near Drapanum in Sicily, called by the Greeks "Pelias."

COLUMBARIUM, a promontory of the iſle of Sardinia, N. of Portu Olbianus, on the E. coaſt: the ſame with *Colymbarium*.

COLUMBATE *of iron*. See COLUMBIUM.

COLUMBIA, in *Geography*, a county of America, in New York, bounded N. by Renſſelaer, S. by Dutcheſs, E. by the ſtate of Maſſachuſetts, and W. by Hudſon river, which divides it from the county of Albany. It is 32 miles long and 21 broad, and is divided into 8 towns, *viz.* of which Hudſon, Claverack, and Kinderkook are the chief. It contained, in 1790, 27,732 inhabitants, and in 1796, 3560 electors.

COLUMBIA, a county of America, in the upper diſtrict of Georgia, bounded by the Savannah river on the E. and N.E., which ſeparates it from the ſtate of Carolina, and N.W. of Richmond county.

COLUMBIA, a townſhip of Waſhington county, in the diſtrict of Maine, on Pleaſant river, adjoining Machios on the N.E., was incorporated in 1796.

COLUMBIA, a poſt-town of America, the capital of Kerſhaw county, and the ſeat of government of S. Carolina. It is ſituated in Camden diſtrict, on the E. ſide of the Congaree river, juſt below the confluence of Saluda and Broad rivers. The ſtreets are regular, and the town contains upwards of 70 houſes. It lies 115 miles N.N.W. of Charleſtown, 35 S.W. of Camden, and 678 S.W. of Philadelphia. N. lat. 34° 1'. W. long 81° 5'.

COLUMBIA, a flouriſhing town of Goochland county in the ſtate of Virginia, on the ſide of James river, near its junction with the Rivanne, 45 miles from Richmond, and 35 miles from Charlotteville.

COLUMBIA, a town of America, in the county of Lancaſter and ſtate of Pennſylvania, ſeated on the N.E. bank of the Suſquehanna river, 10 miles from Lancaſter, and 76 W. by N. from Philadelphia.

COLUMBIA, a town of America, in the county of Hamilton and ſtate of Ohio, ſeated at the confluence of the Little Miami with the Ohio, 6 miles above Cincinnati. The ſettlement began in 1789. N. lat. 39° 20'.

COLUMBIA *College*. See COLLEGE.

COLUMBIA, *territory of*. See WASHINGTON.

COLUMBIANA, a county of America, in the ſtate of Ohio, bounded N. on the county of Trumbull, S. on Jefferſon and Muſkingum counties, E. on the ſtate of Pennſylvania, and the Ohio, and W. on Muſkingum river, and county.

COLUMBIC ACID, in *Chemiſtry*. See COLUMBIUM.

COLUMBIERS, in *Geography*, a town of France, in the department of the Aveiron, and diſtrict of Rhodes; 10 miles W. of it.

COLUMBINA, a name given by Actuarius, and ſome other medical writers, to the verbena, or common vervain.

COLUMBINA *Marga*. See MARLE.

COLUMBINE, in *Botany*. See AQUILEGIA.

COLUMBINE *feathered*. See THALICTRUM *aquilegifolium*.

COLUMBINE, a kind of violet-colour, called alſo dove-colour. See DYEING.

COLUMBIUM, in *Chemiſtry*, a new metal diſcovered by Mr. Hatchett, in the year 1802, in a mineral which he had from the Britiſh Muſeum. The mineral, it appears, had been ſent with ſome ſpecimens of iron ores from Maſſachuſetts in America, to ſir Hans Sloane, in whoſe catalogue it is deſcribed as "a very heavy black ſtone, with golden ſtreaks." By Mr. Hatchett it is deſcribed as of a dark browniſh grey externally, and more inclining to an iron grey internally; he found the longitudinal fracture lamellated; and the croſs fracture had a fine grain. Its luſtre is vitreous, ſlightly inclining in ſome parts to metallic, moderately hard, and very brittle. The colour of the powder was dark chocolate brown; but the ſtreaks were yellow mica. The particles were not attracted by the magnet. Its ſpecific gravity, at the temperature of 65°, was 5.918. A ſeries of very accurate experiments made by Mr. Hatchett proves that this ore conſiſts of iron combined with a new metallic acid: of 200 grains of the ore 42 were found to be the oxyd of iron, and 155 of acid. The mode which Mr. H. adopted to analyſe this columbate of iron was this: he took one part of the ore reduced to powder, and mixed it with five times its weight of carbonate of potaſh, and fuſed them in a ſilver crucible. An efferveſcence took place, which being ſubſided, the whole was poured into a proper veſſel, and ſuffered to cool. Boiling diſtilled water was then poured upon it, and the whole was transferred upon a filter. The inſoluble reſiduum was repeatedly waſhed in diſtilled water. The filtered fluid was now ſuperſaturated with nitric acid. The reſult of which was a white flacculent precipitate, which he denominated *columbic* acid. The inſoluble reſidue was again fuſed with carbonate of potaſh, and treated as before, but ſcarcely any effect was produced, the alkali was therefore waſhed away, and the powder digeſted with muriatic acid, in order to get rid of the iron. The acid was then decanted, and the reſiduum waſhed in diſtilled water. It was again fuſed with carbonate of potaſh, diſſolved, and precipitated with nitric acid. The reſiduum was repeatedly treated in a ſimilar manner, till the whole was completely decompoſed. By theſe means he obtained a precipitate of oxyd of iron which combined with the muriatic acid. The columbic acid is of a pure white colour, but not very heavy, and has ſcarcely any perceptible taſte; it is not ſoluble in boiling water. When ſome of the powder is placed upon litmus paper, moiſtened with diſtilled water, the paper in a few minutes becomes red. When expoſed to the blow-pipe, it is not fuſible, but only becomes of a leſs brilliant white. Having found that this acid poſſeſſed properties different from all other acids, and that the baſe was metallic, Mr. H. gave to the metal the name of *columbium*. In the attempts which he made by heat to reduce it to the metallic ſtate, the oxyd was found only in a ſtate of black powder. From his experiments he found that the metal combines with oxygen in different proportions, and theſe oxyds are diſtinguiſhed by different colours. It combines with ſome of the acids, and forms ſalts; thus we have the ſulphate, muriate, &c. of columbium.

Sulphate of Columbium. Boiling ſulphuric acid forms a tranſparent colourleſs ſolution with columbic acid. When water is added to this ſolution, it becomes turbid, aſſuming a milky appearance; and a white precipitate is gradually depoſited, which cracks as it becomes dry upon the filter, and from white it changes to a lavender blue colour; and when completely dry, to a browniſh grey. It is then inſoluble in water, is ſemitranſparent, and breaks with a vitreous fracture. This precipitate obtained from the ſulphuric ſolution, by the addition of water, is a ſulphate of columbium.

Muriate of Columbium. Columbic acid, when recently ſeparated from potaſh is ſoluble in boiling muriatic acid. This ſolution may be conſiderably diluted with water, without any change being produced. When evaporated to dryneſs, it left a pale yellow ſubſtance, inſoluble in water, and which is diſſolved with great difficulty, when it is again digeſted with muriatic acid.

Phoſphate of Columbium. A few drops of phoſphoric acid being added to a part of the ſolution of columbium in concentrated ſuſphuric acid, at the end of 12 hours converted the whole into a white, opaque, ſtiff jelly, which was inſoluble in water. When a ſmall quantity of phoſporic acid was added to the muriatic ſolution of columbium, in a few hours a white flocculent precipitate was formed. Philoſoph. Tranſ. 1802, part i.

COLUMBO, in *Geography*, the capital of the iſland of Ceylon, and the ſeat of government, is ſituated towards the S.W. part of the iſland, in about 7° N. lat. and 78° E. long. from London. It was captured from the Dutch by the Britiſh troops under general Stewart in 1796. Although Trincomater, on account of its ſituation and harbour, be of greater conſequence to the Britiſh nation to retain, yet Columbo is in every reſpect greatly ſuperior. The number of its inhabitants is much greater; its fort and black town are much larger; the country in which it is ſituated much more fertile; and the rich diſtrict depending upon it much wider, being not leſs than 20 leagues in length and 10 in breadth. Columbo is commonly ſuppoſed to have been firſt fortified by the Portugueſe; but captain Percival queſtions the truth of this ſtatement, as Laurence de Almeyda, after his firſt treaty with the king of the iſland, found that the Moors and Malabars had a fortreſs here, on which ſome guns were planted, which had been procured from ſhips wrecked on this coaſt. That part of the fort, where theſe ancient works ſtood, is now ſtrongly fortified, and ſhewn as the firſt works of the Portugueſe. It is in a manner detached from the main body of the fort, being ſeparated from it by an entrenchment and wall, with a foſſe or ditch, now almoſt choaked up. The fort is placed on a peninſula projecting into the ſea, and it is thus expoſed on all ſides to the ſea-breezes, by which the air is rendered temperate and healthy, though it lies ſo very near the equator. This fort is upwards of a mile in circumference; and is indebted for its ſtrength both to nature and art. On the ſouth ſide the ſurf runs ſo high, and the ſhore is ſo rocky, that it would be dangerous to approach it. On the weſt ſide of the bay, where the ſea is ſmoother, and near the wharf or landing place, which at all ſeaſons of the year is ſafe for boats, the only attempt could be made; but theſe quarters are ſo well defended by the batteries which command the harbour, that there is hardly any probability of its ſucceeding. On the weſt ſide of the fort, and facing the ſea, are two very fine batteries, *en barbet*, intended for the ſecurity of the harbour. Theſe ſtand on a part that projects a conſiderable way from the main body of the fort, from which they are ſeparated by a high wall and ditch flanked with baſtions, and have gates that communicate with the interior of the fort. Here the wharf or landing place is found; it conſiſts of large piles of timber, extending ſeveral yards into the ſea, and affords a very commodious ſtation for loading and unloading ſloops and large boats, which may be brought cloſe alongſide. At this end ſeveral ſtore-houſes, and barracks for half a regiment are erected. The ramparts of the fort are very ſtrong, having eight principal baſtions; and they have alſo a number of leſſer ones, with curtains, banquets, and parapets, communicating with each other all round the fort, and fitted for troops to line and defend with muſketry and field-pieces. The whole fort is ſurrounded by a road and deep oval ditch, over which draw-bridges are thrown at each of the gates. On the outſides are ſome ſmall magazines, with a powder-mill and a ſaw-mill attached to the fort. Adjoining to the covert-way, and at the foot of the plain, is a lake extending three or four miles into the country, in a N. E. direction. For near a mile on the outſide of the fort, the neck of land which connects it with the country, is not above five or ſix hundred yards broad; and in the middle of this ſpace lies the lake, leaving room on each ſide only for a narrow cauſeway. Near the plain an approach might be entirely cut off, by opening the ſluices and cutting the road acroſs, where the lake would be connected with the ſea, and the garriſon completely inſulated. In the centre of the lake is an iſland, communicating with a ſally-a ſally-port on the eaſt face, by a narrow cauſeway and draw-bridges. This is a pleaſant ſpot, abounding with cocoa-nut trees, and was called by the Dutch "Slave Iſland," as it was the place whither they ſent their ſick ſlaves. A battalion of Malays is ſtationed here. This iſland is very convenient, as it lies contiguous to the fort, and opens the neareſt way to the cinnamon gardens, which are cloſe by it. The fort has three gates; the principal one, where the main-guard is ſtationed, which is called the Delph-gate, and leads into the "pettah," or black town. It has two draw-bridges to paſs over the ditch, which here forms an angle. At each of the gates are guard-houſes, with a ſubaltern's guard placed over them.

The plan of Columbo is regular. It is nearly divided into four equal quarters, by two principal ſtreets, which croſs each other, and extend the whole length of the town. To theſe ſmaller ones run parallel, with connecting lanes between them. At the foot of the ramparts, in the inſide, is a broad ſtreet or way, which goes round the whole fort, and communicates with the baſtions and ſoldiers' barracks; and alſo affords, at the different angles, open ſpaces for their private parading. The grand parade is by no means ſufficient for the garriſon, as it can hardly contain one complete regiment. On one ſide of it are ranges of public offices for the civil and military departments, with the town or ſtadt-houſe in the centre of them, where the Dutch held their high court of juſtice. On the arrival of the Britiſh troops they found a rack, wheel, and many other implements of torture, which had been uſed for inflicting puniſhment on criminals, particularly ſlaves, but theſe ſavage modes of puniſhment were immediately aboliſhed by the Britiſh government. On the other ſide of the grand parade ſtand the cinnamon ſtore-houſes, or "go-downs," as they are here called. At the upper end of the parade the Dutch had begun to erect a church, which has never been finiſhed. The Dutch uſually attended divine ſervice at a ſpacious and handſome church in the black town, about a mile diſtant from the fort; and worſhip is ſtill performed there for the Engliſh, either before or after that of the Dutch inhabitants. The government houſe, which faces the harbour, is a very long and capacious building, but more convenient than elegant: ſeveral offices are attached to it, where the buſineſs of government is tranſacted. Behind it is an excellent garden, intended for a "tank" or reſervoir, in caſe of a ſiege; for though every houſe has a well plentifully ſupplied with water through the year, yet it is of a brackiſh quality, and not fit to drink. The Europeans, therefore, both of the civil and military eſtabliſhment, are ſupplied with water from a ſpring, about a mile from the fort, which is brought by means of bullocks, in leathern bags, called here "puckally bags," a certain number of which is attached to every regiment and garriſon in India.

Columbo is built more in the European ſtyle than any other garriſon in India. The interior of the fort has alſo more the appearance of a regular town; the Dutch houſes are all regularly built, though few are above one ſtory high; and the windows have all glaſs-panes, after the European manner. Before each houſe, and connected with it, is a large open ſpace, roofed in and ſupported on pillars of wood, called a "viranda," affording a ſhade from the ſun, and expoſed to the refreſhing breeze of the ſea. The houſes are alſo agreeably ſhaded by a double row of thick-ſpreading trees, planted on each ſide of the ſeveral ſtreets. The walls of the houſes are plaſtered over and white-waſhed with a very fine bright lime, made of burnt ſhells. This beautifully white colour may contribute to the coolneſs of the houſes, but it throws an inſupportable glare on the eyes of the paſſengers along the ſtreets. The houſes are for the moſt part uniformly conſtructed, conſiſting of the hall in the front, with a chamber at each ſide, and another room in the back part, equal in length to the other three, and called the "back viranda." Behind this are one or two ranges of ſmall buildings, proportioned to the ſize of the houſe and deſigned for the accommodation of ſervants, for cellars, and ſometimes for ſleeping rooms. The houſes are covered with indented tiles, which afford no ſecurity againſt rain. In the centre of the principal ſtreet is a very handſome and lofty houſe, which belonged to the Dutch governor, and has ſince been occupied by the commander of the Britiſh forces on the iſland. There is alſo another very handſome and ſpacious houſe for the commandant of the garriſon, with ſuitable offices and gardens. The hoſpital, deſigned for ſoldiers and ſailors, is a roomy and convenient building. Three or four battalions are uſually ſtationed as a garriſon in the fort of Columbo.

The harbour of Columbo, which lies on the weſt ſide, is an open road, affording good and ſafe anchorage to ſhips for only four months of the year, from December to April, when the N.W. winds do not prevail to any great degree; but about May, when the monſoon ſets in on the Malabar coaſt, and extends its ravages to the W. coaſt of Ceylon, the roads of Columbo no longer afford any protection. Hence it is, that Columbo is cut off from any intercourſe by ſea, with the other parts of the iſland, for two thirds of the year. For ſix months of the ſtormy ſeaſon, this ſide of the iſland is ſubject to very heavy falls of rain, accompanied with dreadful thunder and lightning, and violent winds blowing in there. During this ſeaſon the variations of the climate are very great. The heavy rains, predominating moſt by night, render the air damp and chill; and the exceſſive heat of the ſun by day is almoſt inſupportable. Theſe tranſitions make the climate more unhealthy at this ſeaſon than during the hot weather. During the rainy ſeaſon, the Indians from the continent are very ſubject to fluxes, dyſenteries, and fevers. They are alſo ſubject to another very extraordinary diſeaſe, called the "Berry berry," occaſioned by low diet and hard water, which ſwells the body and legs of the patient to an enormous ſize, and generally carries him off in twenty-four hours. The cure is effected by rubbing the diſeaſed perſon all over with cow-dung, oil, chinam, lime-juice, and other preparations from herbs, and then burying him up to the chin in hot ſand. The Britiſh ſoldiers counteract the bad effects of the air and water, by drinking plentifully of arrack and ſmoking tobacco. The "Pittah," or black town, of Columbo deſerves particular notice, on account of its extent and ſuperior ſtructure, compared with other ſuch towns attached to the forts of India. It is divided into two parts; that neareſt the fort conſiſts of one very large ſtreet, beginning at the eſplanade near the walls, and running on till ſtopped by an old mud wall, and a gate called the "Kenman's port." In this diviſion of the Pittah are moſt excellent houſes, where many Dutch gentlemen and merchants reſide. Through Kenman's port there is a narrow paſſage leading into the other diviſion, which conſiſts of a long ſtraggling town, ſkirted on one ſide by the lake above deſcribed. Beſides a principal ſtreet, there are ſeveral ſmaller ones running parallel to it, in one of which is a large well-conſtructed building, called the "Orphan ſeminary, or ſchool," where the Dutch uſed to educate the children of their ſoldiers and the poorer Europeans, as well as thoſe they had by the native women. Here the boys were educated at the public expence, till they were fit for trades; and the females were either ſettled in ſome comfortable ſituation, or married to perſons of their own rank. This laudable inſtitution is ſtill maintained by the Britiſh government. Cloſe by the eſplanade, and adjoining the black town, is the burial ground of the garriſon. The ſhops, bazars, and ſtalls, placed all along the ſtreets, are repleniſhed with various articles of merchandize, peculiarly in uſe among the natives of India; and the town, during the whole day, ſwarms with people of all deſcriptions. The boats or canoes uſed in the fiſheries of Columbo are of a curious ſhape and conſtruction. They are about fifteen feet long, and not more than two in breadth. They move with great ſpeed, eſpecially with the addition of a very large ſquare ſail; and, to prevent their overſetting, a log of wood is extended five or ſix feet from the end of the boat, by way of out-rigger; this log is faſtened to the boat by two long and bent poles, and ſeems to ſerve at once for helm and ballaſt. A paddle, ſomewhat in the form of a ſhovel, is uſed to guide the boat's head. The body of the canoe is a large tree, hollowed out by fire, or ſcooped out by the carpenters. Along its ſides boards are nailed to the height of about two feet, and in the form of a gun-wale, to prevent the water from getting in. When large burdens are to be carried inland by the canals or rivers, two or three of theſe canoes are laſhed together without the out-riggers. Split canoes, bamboes, or betel tree, are then laid acroſs them, ſo as to form a kind of raft; which, though ever ſo much loaded, will draw but very little water. Other flat-bottomed boats of a much greater breadth are alſo uſed by the natives. Theſe are thatched with cocoa-tree leaves, like a houſe, and are large enough to hold couches. Near Columbo may be ſeen two or three hundred of theſe boats in regular rows, moored along the banks of the rivers, with entire families on board, who make them their habitations.

Columbo, for its ſize, is one of the moſt populous places in India; and its population conſiſts of a great variety of nations. Beſides Europeans and Cingleſe, the proper natives of the iſland, you meet, ſcattered over the town, almoſt every race of Aſiatics; Moors of every claſs, Malabars, Travancorians, Malays, Hindoos, Gentoos, Chineſe, Perſians, Arabians, Turks, Maldivians, Javians, and natives of all the Aſiatic iſles; Perſees, or worſhippers of fire, who would rather have their houſes burnt, and themſelves periſh in the flames, than employ any means to extinguiſh it. Here are alſo a number of Africans, Caffrees, Buganeſe, or a mixed race of Africans and Aſiatics; beſides the half-caſts, people of colour, and other races which proceed from a mixture of the original ones. Each of theſe different claſſes of people has its own manners, cuſtoms and language. The language moſt generally ſpoken by both the Europeans and Aſiatics, who reſort to Columbo is the Portuguſe of India, a baſe, corrupt dialect, altogether different from that ſpoken in Portugal.

Columbo, though difficult of acceſs, is ſituated in a rich diſtrict, and furniſhes a great variety of articles to commerce; and, therefore, it is much frequented both by Europeans and the natives of the different coaſts of India. From this diſtrict large quantities of cinnamon and pepper, the ſtaple ſpices of the iſland, are yearly tranſported to Europe in veſſels that touch here on their voyage from Madras and Bengal. A great quantity of arrack is made in the neighbourhood of Columbo and the other diſtricts along the weſt coaſt. A large quantity of Coya-rope, or cordage is alſo manufactured here, for the ſupply of our ſhips on the various ſtations in thoſe ſeas. The inferior articles, exported by the Moors and Malabars, who reſide here for that purpoſe, are betel-leaf and arecca-nut, jaggory, or a ſort of coarſe blackiſh ſugar, cocoa-nut, and oil, honey, bees-wax, cardamoms, coral, ivory, fruit, and a variety of other ſmaller articles. In return they import coarſe woollen cloths, and calicoes, pieces of printed or painted clothe for women's apparel, coarſe muſlins, handkerchiefs, palampores, ſtockings, china-ware, tin, copper, and a variety of toys; alſo bomelves, a ſpecies of fiſh peculiar to Bombay, and onions, from the ſame place, where they are remarkably good. Every year, generally towards February, a Portugueſe or Chineſe ſhip arrives from Macao with teas, ſugar, candied ſweetmeats, hams, ſilks, velvets, nankeens, umbrellas, ſtraw-hats, all kinds of china-ware and toys; all which articles find a very ready ſale, and are paid for in hard caſh. The current coin at Columbo, as well as in the other European dominions on the iſland, conſiſted, on the arrival of the Engliſh, of rix-dollars, a nominal coin, like one pound ſterling, valued at a certain quantity of copper money. There were beſides ſeveral ſmall copper coins, called pice or ſtivers, half-pice, and dudies. Four pice or two dudies made a fanam, and ſeven fanams were equal to a rix-dollar. New regulations have been adopted with regard to the coin ſince the iſland has belonged to the Engliſh. There is now current a new coinage of double and ſingle pice and half-pice made by our Eaſt India Company. A pice is about a halfpenny ſterling; four pice are equal to a fanam, and twelve fanams to a rix-dollar, or, as it is uſually called by our people, a copper rupee. This latter coin paſſes for about two ſhillings ſterling; and four of theſe are equivalent to a ſtar pagoda, a Madras gold coin worth eight ſhillings ſterling, the fluctuation in the value of money in Ceylon is very great, and depends upon the plenty and ſcarcity of gold and ſilver there. The expence of coining at Columbo is more conſiderable than on the continent of India. Horſes and ſervants are particularly expenſive, vegetables are extremely ſcarce, and they form a great article of food in thoſe warm climates. Such articles, however, as are the native produce of the iſland, are found in great abundance, and at a moderate price. Beef, fiſh, and fowl, in particular, are both cheap and plentiful. Mutton is exceſſively dear, as no ſheep can be reared in the neighbourhood of Columbo, which ſome attribute to the noxiouſneſs of the climate or paſture of the iſland, but which may be principally owing to their falling an eaſy prey to jackals, ſnakes, and other deſtructive animals, and alſo to certain poiſonous herbs that occur in many places. Pigs and ducks are plentiful and cheap. Geeſe are rare, and turkeys are not to be had, except occaſionally by importation from other parts of India.

The country round Columbo for ſeveral miles is flat and very rich. It is diverſified with fields of rice and paſture, as well as a variety of groves, in which the cocoa-tree is conſpicuous. The ſcene is embelliſhed by a number of ſmall rivers, lakes, and canals. The ſhady roads, which every where interſect the country, afford to the traveller an agreeable ſhelter; while the numerous country ſeats and gardens which ſkirt them preſent his eye with a continual change of gratification. The river Mutwal extends itſelf here into a very broad channel, and by its numerous windings affords a moſt enchanting proſpect from the road, which runs along its banks for many miles. Several temples of the natives are ſituated along the banks of this river and among the adjoining groves. One of the chief beauties in the vicinity of Columbo is the immenſe number of cinnamon trees, which produce the niceties of the iſland. In the woods they grow wild in abundance, and in the gardens they are now regularly cultivated with the greateſt ſucceſs. Percival's Account of the Iſland of Ceylon, 1805.

Columbo, in the *Materia Medica*. This root was firſt brought from the town of Columbo, in the iſland of Ceylon, in which country it had long been uſed as a valuable remedy in bilious fevers, and other diſorders of the ſtomach and bowels. Our practitioners in the Eaſt Indies adopted the uſe of this root from them, and it is now deſervedly in high reputation in moſt parts of Europe. The plant that yields it is not commonly known.

Columbo root comes to us in circular pieces about two inches in diameter, covered with a thick wrinkled bark of a dark brown externally, but a light yellow within. On paring off this bark the root is ſeen to conſiſt of three diſtinct lamina. The whole is uſed indiſcriminately in medicine.

Columbo root has an aromatic ſmell; the taſte is bitter and nauſeous. It gives no eſſential oil when diſtilled with water, and contains ſcarcely any volatile aromatic parts. When boiling water is poured on the powdered root a ſtrong infuſion is produced, which poſſeſſes all the ſenſible qualities and virtues of the plant, but it grows mouldy in a day or two. Spirit of wine alſo extracts the active qualities of this root very readily.

Columbo is employed with nearly equal advantage in ſubſtance in ſpirituous tincture or in watery infuſion, and generally with the addition of cinnamon or ſome grateful aromatic. This root is of ſingular efficacy in ſtrengthening the fibres of the ſtomach and bowels, either in chronic caſes, or more particularly in cholera morbus, dyſentery, and other violent diſorders of the alimentary canal, where, after due evacuations, it may be employed with great ſucceſs in checking the inceſſant vomiting action of the bowels that bring down the powers of life with ſuch rapidity.

An extract and a tincture of Columbo are kept in the ſhops, the latter of which is by itſelf a very uſeful ſtomachic taken daily in very ſmall doſes.

COLUMBUS, Christopher, in *Biography*, a ſubject of the republic of Genoa, celebrated in hiſtory as the diſcoverer of America. Neither the exact time nor place of his birth can be aſcertained with any degree of certainty, but it is generally ſuppoſed that he was born in ſome part of the Genoeſe dominions about the year 1447. He is ſaid to have deſcended from an honourable family, reduced by various misfortunes to a ſtate of indigence. In whatever rank of ſociety his parents moved, it is certain that they gave their ſon an education adapted to the bent of his genius; at ſchool he acquired the elements of the Latin language, and made ſome proficiency in geometry and the other ſciences which he was enabled in the future part of his life, to apply to the practical parts of navigation. At the age of fourteen he went to ſea, and though his firſt voyages were confined to the Mediterranean, yet he very ſoon ventured out on the northern ſeas, and viſited the coaſts of Iceland, to which the Engliſh and other nations reſorted on account of its fiſhery. About the year 1467 he entered into the ſervice of a ſea captain of his own name and family, and ſpent ſome years in a predatory warfare againſt the Mahometans and Venetians the rivals of his country in trade. In this ſituation he continued acquiring both wealth and reputation, till at length in an obſtinate engagement with ſome Venetian veſſels, off the coaſt of Portugal, the ſhip in which he ſerved took fire, and he, with difficulty, preſerved his life by throwing himſelf into the ſea, and ſwimming a diſtance of two leagues to the ſhore. As ſoon as he had recovered ſtrength for the journey he repaired to Liſbon, where his brother Bartholomew had ſettled, and where he found many of his countrymen, who, like himſelf, had embarked in the ſea ſervice. Here his merit and talents were ſoon appreciated; and here he married the daughter of Pereſtrelle, one of the captains employed by prince Henry in his early navigations, and who, under his protection, had diſcovered and planted the iſlands of Porto Santo, and Madeira. Columbus got poſſeſſion of the journals and charts of this experienced navigator, and from them he learned the courſe which the Portugueſe had held in making their diſcoveries, as well as the various circumſtances which guided and encouraged them in their attempts. While he contemplated the labours of his father-in-law, and read the deſcription of the countries which he had ſeen, his own impatience to viſit them became irreſiſtible. To indulge it he made a voyage to Madeira, and for ſeveral years traded with that iſland, with the Canaries, the Azores, the ſettlements in Guinea, and all other places which the Portugueſe had diſcovered on the continent of Africa. He now began to think of extending the boundaries of nautical knowledge. He was ſatisfied, not only that there muſt be lands ſtill further to the weſt, than thoſe already explored, but that a ſhorter paſſage to the Eaſt Indies, then the great object of the Portugueſe navigators, might be found by ſteering in that direction, than round the continent of Africa. When he had ſettled his plan, he was anxious to ſecure the patronage and ſupport of ſome European power capable of undertaking ſo important an enterpriſe. With this view, he laid his ſcheme before the ſenate of Genoa, and, making his country, for which he bore a filial and ſincere affection, the firſt tender of his ſervice, offered to ſail under the banners of that republic, in queſt of new regions, which he expected would render illuſtrious his own name, and the nation which ſhould enable him to realize his vaſt projects. Genoa rejected his offer: and Portugal, to whom he next applied, treated him with ſo much duplicity, that he went himſelf to Spain, while at the ſame time he ſent his brother Bartholomew into England to make the like propoſals to both courts. By both, his ſchemes were at firſt ſlighted, till, by the interpoſition of ſome zealous friends at the court of Spain, a change was effected in his favour, and in the ſpring of 1472 a treaty was ſigned with Columbus, by which Ferdinand and Iſabella, the ſovereigns of Spain, appointed him their high admiral in all the ſeas he ſhould diſcover, and their viceroy in all the iſlands and continents. They granted him and his heirs a tenth of all the profits that ſhould accrue from the enterprize, with ſome other important advantages. As ſoon as the treaty was ſigned, Iſabella, by her activity and attention, in forwarding the preparations for the voyage, endeavoured to make ſome reparation to Columbus for the time which he had loſt in fruitleſs ſolicitation.

On the third of Auguſt 1492, Columbus ſet ſail with three ſmall ſhips and ninety men. The expence of which did not amount to more than 4000*l.* He had already, in the moſt public manner, implored the guidance and protection of heaven, and on the morning of his departure the ſhores were crowded with ſpectators, who ſent up their ſupplications to the Almighty for the proſperous iſſue of the voyage. Columbus ſteered directly for the Canaries, where, on account of the ill condition of the ſhips, he was obliged to refit. Having ſupplied himſelf with freſh proviſions, he ſailed from Gomera, one of the moſt weſterly of the Canary iſlands, on the ſixth day of September. Here the voyage of diſcovery may be ſaid to begin; for Columbus holding his courſe due weſt, left immediately the uſual track of navigation, over a vaſt and unknown ocean, with no other guide, than well-founded hopes and rational conjectures. Scarcely had he loſt ſight of the Canaries, when ſeveral of his men exhibited ſigns of conſternation bordering on deſpair. He comforted them with the vaſt wealth which was to be found in thoſe regions whither he was conducting them, and in his own perſon he ſet ſuch an example of patience and induſtry as could not fail of exciting the admiration of thoſe about him. Scarcely did he allow himſelf time for neceſſary refreſhments: he regulated every thing; he ſuperintended the execution of every order, and kept the deck with the ſounding line or inſtrument for obſervation perpetually in his hand, and noting down every unuſual appearance with the utmoſt accuracy and preciſion. Three weeks had they traverſed the ocean, and had proceeded to a diſtance which Columbus thought it prudent to conceal, when his men became mutinous, and even threatened to throw their admiral overboard ſhould he perſiſt in an undertaking which they ſuppoſed muſt prove fatal to them all. He ſucceeded for the preſent in quieting their apprehenſions, but in a few days they became more violent, declaring that nothing ſhould induce them to proceed in ſo mad an enterpriſe; after trying every means of perſuaſion in vain, he at length promiſed to direct his courſe homewards within three days, ſhould not land be diſcovered. This propoſition did not appear unreaſonable to the men, and to the commander it appeared ſufficiently ſafe, for the preſages of diſcovering land by the flight of birds, &c. were now ſo numerous and promiſing that he deemed them infallible. From a variety of ſymptoms Columbus was ſo confident of being near land, that on the evening of the 11th of October, after the uſual invocations to heaven for ſucceſs, he ordered the ſails to be furled, and the ſhips to lie to, keeping the ſtricteſt watch, leſt they ſhould be driven on ſhore. During this interval of ſuſpenſe and expectation, no man ſhut his eyes, all kept upon deck, gazing intently towards that quarter where land was expected to be diſcovered. At ten o'clock Columbus, ſtanding on the forecaſtle, obſerved a light at a diſtance: he pointed it out to another, and he again to a third perſon; all three ſaw it in motion, and at midnight there was heard from the foremoſt veſſel the joyful ſound of *land, land.* Having, however, been frequently deceived by falſe appearances, every man was ſlow of belief; and waited in all the anguiſh of uncertainty and impatience for the return of day. When the morning dawned their doubts were diſpelled, and an iſland was ſeen about two leagues to the north, whoſe verdant fields, well ſtored with wood, and watered with many rivulets preſented the aſpect of a delightful country. Thankſgivings were inſtantly offered to heaven: never was gratitude more ſincere, never were the expreſſions of joy more ardent, than thoſe which proceeded from every tongue. Their duty to God was followed by an act of juſtice to their commander. They threw themſelves at the feet of Columbus, with feelings of ſelf-condemnation, mingled with reverence entreating pardon for their paſt conduct; and now they regarded as the favourite of heaven the man whom they lately reviled as a viſionary and impoſtor. No ſooner had the ſun tinged with its rays the ſhores of the newly diſcovered iſland, than their boats were manned and armed. As they approached the coaſt with colours, muſic, and martial grandeur, they ſaw it covered with a multitude of people, whom the novelty of the ſpectacle had drawn together, whoſe attitudes and geſtures expreſſed wonder and aſtoniſhment at the ſtrange objects which preſented themſelves to their view. The land proved to be one of the Bahama iſlands, named afterwards by Columbus, San Salvador: he was the firſt European who ſet foot in the New World which he had diſcovered, and he took ſolemn poſſeſſion of it for the crown of Caſtile and Leon, with all the formalities which the Portugueſe were accuſtomed to obſerve in acts of this kind, in their new diſcoveries. The Spaniards, while thus employed, were ſurrounded by many innocent and unſuſpecting natives, who gazed in ſilent and awful admiration upon actions which they could not comprehend, and of which they could not foreſee the direful conſequences. Towards the evening Columbus returned to his ſhips accompanied with many of the iſlanders in their canoes. "Thus," ſays Dr. Robertſon, "in the firſt interview between the inhabitants of the Old and New Worlds, every thing was conducted amicably, and to their mutual ſatisfaction. The former, enlightened and ambitious, formed already vaſt ideas with reſpect to the advantages which they might derive from the regions that began to open to their view. The latter ſimple and undiſcerning had no foreſight of the calamities and deſolation which were approaching their country."

From San Salvador, Columbus proceeded on other diſcoveries; he ſaw ſeveral iſlands, and touched at three of the largeſt, on which he beſtowed the names of St. Mary of the Conception, Ferdinanda, and Iſabella. He viſited alſo Cuba and Hiſpaniola; wherever he went he inquired for gold, and having obtained a certain quantity of the precious metal, and made other arrangements, he took his departure homewards. He encountered a violent tempeſt, in which he had nearly loſt his ſhips. While all on board were overwhelmed with a ſenſe of perſonal danger, Columbus was only anxious for the means of preſerving a record of his great diſcoveries. Retiring to his cabin, he wrote an account of what he had ſeen and done, which he covered with wax, encloſed in a tight caſk, and committed to the ſea with a proper direction, hoping that it might be fortunately landed on ſome European ſhore. The ſtorm, however ceaſed, and in a few days he found himſelf approaching the Azores. Here he obtained proviſions, and renewed his voyage. When he was almoſt within ſight of the Spaniſh coaſt, another ſtorm aroſe, that forced him to take ſhelter in the Tagus, from whence he proceeded to Liſbon; where, in the preſence of the king of Portugal, he narrated every thing that he had done and ſeen. Columbus remained at Liſbon but five days, and on the fifteenth of March he arrived in the port of Palos, ſeven months and eleven days from the time when he ſet out thence. As ſoon as his ſhip was diſcovered, the inhabitants ran eagerly to the ſhore, to welcome their relations and fellow-citizens, and to learn the tidings of their voyage. Columbus repaired to the court, then at Barcelona, where he was received with all the reſpect and honour due to his great atchievements. Every mark of attention that gratitude or admiration could ſuggeſt was conferred upon him. All his ſtipulated privileges were confirmed, his family was ennobled; and, which was moſt ſatisfactory to his active mind, another armament was immediately fitted out for him. This conſiſted of 17 ſhips and about 1500 perſons; of whom a large number were men of diſtinction, deſtined to ſettle in the newly diſcovered countries.

On the 25th day of September 1493, Columbus ſailed on his ſecond voyage from Cadiz. He firſt reached the Caribbee or Leeward iſlands, which he viſited, and then proceeded to Hiſpaniola, where he had left a ſmall garriſon of his own men, but who had been deſtroyed, probably from miſconduct on their own parts, by the natives. Inſtead of waſting his time in puniſhing paſt wrongs, Columbus took precautions for preventing any future injury. With this view he built a ſmall town, which he named Iſabella, in honour of his royal patroneſs. While ſome were employed in the neceſſary operations of building, he ſent others to explore the interior of the country, in the hope of finding gold. The hardſhips to which the Spaniards were obliged to ſubmit, rendered them impatient of control, and it was with the utmoſt difficulty that Columbus could maintain any ſubordination. Signs of mutiny were every where exhibited; and to the commander was imputed the moſt unworthy motives, by perſons from whoſe rank in ſociety better and more rational conduct might have been expected. Having, however, by prudence and vigour allayed the ferment, he left his brother Diego as governor of the ſettlement, and proceeded with a ſquadron in queſt of new diſcoveries. During a tedious voyage of five months, in which he endured every hardſhip, he diſcovered only the iſland of Jamaica. But on his return to Hiſpaniola, he had the ſatisfaction of finding there his brother Bartholomew, whom he had not ſeen for a long period, and who had brought with him a large ſupply of proviſions and men. About this period the native Indians perceiving that the yoke impoſed upon them by the invaders would prove intolerable, reſolved, if poſſible, to free themſelves from ſo dreadful an evil. Hoſtilities were commenced, and much blood was ſhed on both ſides; but in the event the Indians were completely defeated. The conſternation with which the Indians were filled by the noiſe and havoc made by the fire-arms, by the impetuous force of the cavalry, and the fierce onſet of twenty large dogs trained for the purpoſe, was ſo great, that they threw down their weapons, and fled, without attempting farther reſiſtance. Many were ſlain, more were taken priſoners, and reduced to a ſtate of the moſt humiliating ſervitude; a rigorous tax was impoſed upon them of gold, which was the deareſt object of European ambition, and which was now become neceſſary to plead the cauſe of Columbus in Spain, where numerous accuſations had been laid againſt his conduct. Willing, however, to meet the charges in perſon, he inveſted his brother Bartholomew with full power of government during his abſence, and then ſet ſail. He arrived in Spain in 1496, and immediately appeared at court, with the modeſt but determined confidence of a man, conſcious not only of his own integrity, but of having performed many very eminent ſervices for the ſtate, in whoſe employment he had embarked. The dignity of his conduct ſilenced his enemies; and, with the aſſiſtance of the gold and precious commodities which he had brought with him, he recovered the good opinion of his ſovereigns. They reſolved to make every exertion to render the new colony a permanent and complete eſtabliſhment, by ſending out ſuch reinforcements as Columbus thought neceſſary for the purpoſe.

It was not, however, till late in the ſpring of 1498, that he was enabled to proceed on his third voyage; during which he diſcovered Trinidad, at the mouth of the Orinoco. The vaſt ſize of this river, though only ranking in the third or fourth magnitude of rivers in the New World, convinced him that it muſt have its riſe in a great continent. He even touched upon various parts of the continent, without ſuſpecting it, conceiving that they belonged to iſlands which he had not leiſure to explore. Columbus arrived at Hiſpaniola in Auguſt, where he found that his brother had removed the colony to St. Domingo, on the oppoſite ſide of the iſland. During his abſence, a mutiny had been excited, and ſome of his people had ſeceded from the main body. To calm the diſcontent, he gave them allotments of land, to which were annexed diſtributions of poor natives, that proved to them an intolerable ſource of oppreſſion. New complaints were ſecretly tranſmitted to court againſt him and his brothers; and having no opportunity of vindicating his conduct, his powers were at firſt greatly abridged by a ſeparate commiſſion of diſcovery having been granted to Alphonſo d'Ojeda; who was accompanied in his voyage by Amerigo Veſpucci, after whom the whole New World has ſince been named. Columbus was then recalled, and Francis de Bovadilla appointed in his ſtead. By his unworthy and inſolent ſucceſſor, Columbus was thrown in chains, and treated with other indignities, which have for ever diſgraced the court that granted to him ſo much power. The captain of the ſhip, to whoſe charge Columbus was given, offered, in the moſt reſpectful manner, to liberate him, but he indignantly refuſed to ſuffer his irons to be removed, but by the expreſs command of his ſovereigns. On his arrival in Spain, he was inſtantly ſet at liberty, and treated with that civility and kindneſs from the king and queen which he had formerly experienced. Bovadilla was diſgraced, but Columbus could not forget the injuries which he had ſuſtained; he carried with him, wherever he went, the fetters he had worn, and ordered that they ſhould be buried in the ſame grave with himſelf.

In 1502, he obtained permiſſion to make a fourth voyage and on arriving off St. Domingo, he found eighteen ſhips richly laden ready to depart for Europe. His own experience led him to perceive an approaching ſtorm; he accordingly requeſted permiſſion to enter the harbour, and at the ſame time warned the fleet of the dangers to which it would infallibly be expoſed by ſailing at that juncture. His requeſt and his warning were equally diſregarded. The hurricane came on, and though, by proper precautions, he ſaved his own veſſels, it fell upon the fleet with ſo much violence, that only two or three veſſels eſcaped; and Bovadilla, with ſeveral others of his moſt inveterate enemies, periſhed with all their ill-gotten wealth. Among the veſſels that weathered the ſtorm, was that on which the wreck of Columbus's property was embarked. This, which, by ſome, was referred to the ſuperintendence of providence, was, by others, imputed to certain magical arts exerciſed by Columbus himſelf. In purſuing his voyage, he traced the coaſt of Darien, in hopes of diſcovering a ſtrait, which he fondly imagined would open a new tract to the Eaſt Indies. Although he was diſappointed in his expectations, he was, nevertheleſs, ſo much delighted with the fertility of the country, and conceived ſuch an idea of its wealth, from the ſpecimens of gold produced by the natives, that he reſolved to leave a ſmall colony upon the river Belem, in the province of Veragua, under the command of his brother, and to return to Spain, to procure the means requiſite for rendering the eſtabliſhment permanent. On his voyage, he was driven back by a violent tempeſt from the coaſt of Cuba, his ſhips fell foul of one another, and were ſo much ſhattered by the ſhock, that with the utmoſt difficulty they reached Jamaica. Here he endured the greateſt calamities, as well from the mutinous diſpoſitions of his own men, as from the ſuſpicions of the natives, who refuſed to ſupply him with proviſions, till, by his ſkill in aſtronomy, he predicted the event of an approaching eclipſe, a circumſtance that gave him an irreſiſtible authority over their minds. From this time the ſuperſtitious natives venerated him as a god, and not only furniſhed him profuſely with proviſions, but cautiouſly avoided every thing that could give him offence. Columbus was at length delivered by a fleet ſent from Hiſpaniola; and, after various difficulties, he arrived at St. Lucar in Spain in December 1504. Here, in addition to his other ſufferings, he learned that his patroneſs, Iſabella, was dead: from her alone he anticipated the redreſs of his wrongs, which he little expected from the king. To him, however, as the laſt reſort, he applied, who amuſed him with promiſes, but, who, inſtead of granting his claims, inſulted him with the propoſal of renouncing them all for a penſion. Diſguſted with the ingratitude of a monarch whom he had ſerved with fidelity and ſucceſs; exhauſted with the calamities which he had endured; and broken with the infirmities which theſe brought upon him, Columbus breathed his laſt at Valladolid, on the 20th of May 1506, in the 59th year of his age. In the cloſing ſcene he exhibited a dignity and compoſure of mind ſuitable to the greatneſs of his character, and to thoſe ſentiments of piety which he had ever cheriſhed in all the trials to which his life had been expoſed. Ferdinand, who had ſlighted his well-founded claims when living, beſtowed upon him funeral honours, and confirmed to his children their hereditary rights. Columbus was buried in the cathedral at Seville, and on his tomb was engraven an epitaph, in memory of his renowned actions and diſcovery of a New World, which in juſtice ought to have been denominated Columbia, in order that the name might for ever excite the remembrance of the hero who, in ſpite of every obſtacle, ſucceeded in realizing a project, eſteemed by his contemporaries as the chimera of a diſturbed imagination. Robertſon's Hiſt. of America.

Juſtinianus, in his curious edition of the Polyglot Pſalter, 1516, of which a beautiful copy is preſerved in the Cracherode collection in the Britiſh Muſeum, has introduced, by way of commentary on Pſ. xix. 4. "their words are gone forth to the ends of the earth," a very curious ſketch of the life of Columbus, an account of his diſcovery of America, and alſo a deſcription of the inhabitants, particularly of the female native Americans.

Columbus, *Congregation of St.*, is the name of a congregation of regular canons, formerly of great extent; having under it an hundred abbeys or monaſteries, in the Britiſh iſlands. See Congregation and Canon.

COLUMELLA, in *Anatomy*. See Uvula.

Columella, in *Botany*, is uſed by Linnæus for the central pillar of a capſule, to which the ſeeds are uſually attached. Gærtner is content with the term receptacle for this part. See Receptacle.

Columella, Lucius, Junius, Moderatus, in *Biography*, was born at Cadiz, and flouriſhed at Rome in the time of the emperor Claudius. He is chiefly celebrated for a work which has come down to our own times, entitled "De Re Ruſtica," and which contains, in twelve books, rules concerning the culture of various vegetables, and the management of domeſtic animals. A ſeparate book "De Arboribus," is annexed to theſe. They have gone through many editions, but the beſt and moſt accurate is that in Geſner's collection of the Rei Ruſticæ Scriptores. Moreri.

Columellæ *muſculus teres*, a name given by Morgagni, and ſome others, to the muſcle called by Albinus *azygos uvulæ*.

COLUMELLIA, in *Botany*, Willd. 1525. Jacq. Hort. Schoenb. 3. 28. tab. 301. Claſs and order, *ſyngeneſia ſuperflua*. Nat. Ord. *Compoſitæ*, Linn. *Corymbiferæ*, Juſſ. Vent.

Eſſ. Ch. Receptacle naked, honey-combed. Down with a toothed margin. Common calyx cylindrical, imbricated. Rays of the florets undivided.

Sp. C. *biennis*. *Root* biennial. *Stem* cylindrical, pubeſcent, corymbous at the top. *Leaves* an inch and a half long, ſeſſile, linear, obtuſe, hairy. *Flowers* both of the diſk and ray yellow, ſeſſile, ſolitary at the diviſions of the branches. A native of the Cape of Good Hope.

COLUMN, in *Architecture*, *columna*, Latin, derived from *columen*, a ſupport. In a ſtrictly architectural ſenſe a column may be defined as an object conſiſting of a nearly cylindrical ſhaft with a capital, and either with or without a baſe. The column, as forming the principal part of an order of architecture, will be conſidered under the articles Doric, Ionic, Corinthian, Tuscan, and Composite *Orders*, and in the preſent article we ſhall treat of columns according to their matter, conſtruction, diſpoſition, and uſe; under the firſt head may be placed

Column, *moulded*, is that made by impaſtation of gravel and flints of divers colours, which are bound together with a cement, which grows perfectly hard, and receives a poliſh like marble

The ſecret of making theſe, it appears, the ancients were maſters of, by the columns lately diſcovered near Algiers; which are, doubtleſs, the ruins of the ancient Julia Cæſarea; on all theſe is found the very ſame inſcription in antique characters; the contours, accents, and even faults, being repeated in every ſhaft; an inconteſtible proof of their being moulded.

Column, *fuſible*. Under this term are comprehended, not only columns of various metals, and other fuſible matters, as glaſs, &c. but alſo thoſe of ſtone, ſaid to have been caſt; the ſecret of which ſome will have us believe to have been known to the ancients.

Column, *tranſparent*, any column made of tranſparent matter; as were thoſe of cryſtal in the theatre of Scaurus, mentioned by Pliny; and thoſe of tranſparent alabaſter, in the church of St. Mark, at Venice.

Column, *water*, is a ſort whoſe ſhaft is formed of a large *jet d'eau*; which ſpouting out water violently from the baſe drives it within the tambour of the capital, which is made hollow; whence, falling down again, it has the effect of a liquid cryſtal column. See Fountain.

An inſtance of this we have at Quinto d'Aveiro, near Liſbon.

Column, *hydraulic*, is that whoſe ſhaft appears to be of cryſtal; being formed by a number of little threads of water, falling from holes made in a girt of metal, at equal diſtances, by means of a pipe mounting through the middle thereof; as in the gardens at Verſailles.

Column, *hydraulic*, alſo denotes a column from whoſe top proceeds a *jet d'eau*, to which the capital ſerves as a baſon; whence the water deſcends by a little pipe, which turns ſpirally around the ſhaft. Such are the Ionic columns of the caſcade of the Belvidera at Freſcati; and thoſe of the vineyard Matthei at Rome.

Columns, *with regard to their Conſtruction*.

Column *of bands or tambours*, a column whoſe ſhaft is formed of ſeveral courſes of ſtone or blocks of marble of leſs height than the diameter of the column, this is what Ulpian means by *columna ſtructilis*, or *adpacta*, which is oppoſite to the *columna ſolida*, or *integra*, i. e. of one piece. This method is only practiſed in very large columns, for inſtance as the Trajan column. Smaller columns are often compoſed of three or four pieces, and this method the French diſtinguiſh by a particular term, *colonne par troncons*, of which we have no proper tranſlation.

Column *of Maſonry*, is built of rough ſtones or compaſs bricks, and covered with ſtucco.

Column, *geminated*, that whoſe ſhaft is formed by three ſimilar and equal ſides, or ribs of ſtone, fitted within one another; and faſtened at bottom with iron pins, and at the top with cramp-irons. This is to be fluted, that the joints may be the leſs diſcernible.

Column, *encruſtated*, is made of ſeveral ribs, or thin ſhells of fine marble, or ſome other rare ſtone, cemented upon a mould of ſtone, brick, or the like. This is done with deſign both to ſave the precious matter, as oriental jaſper, lapis lazuli, agate, &c. or to repreſent pieces of ſuch ſtones of an extraordinary ſize, by the neatneſs and cloſeneſs of the incruſtation, which renders the joints imperceptible.

Column, *banded*; a column whoſe ſhaft has ſeveral bands or cinctures either plain or ornamented, which project ſomewhat beyond the general line of the ſhaft.

Banded columns were firſt introduced by De Lorme at the Chapel de Villers-Coherets, and at the Thuilleries, who imagined this method of concealing the joints of the different blocks of ſtone forming the ſhafts.

COLUMN, *fluted*, called alſo *channelled*, and *ſtriated column;* that whoſe ſhaft is adorned with flutes or channellings; either from top to bottom, or only two thirds of its height.

COLUMN, *cabled or rudented*, is a fluted column, whoſe channels are filled in with aſtragals which generally reach one third of the height of the ſhaft from the baſe.

COLUMN, *cylindrical*, is that which has neither ſwelling nor diminution.

COLUMN, *diminiſhed*, is that which has no ſwelling, but whoſe ſhaft is tapered in a ſtraight line from the baſe to the capital. This is the method obſerved in, we believe, all the Grecian remains of architecture, and in many of the Roman, as in the portico of the Pantheon. The oppoſite practice of giving an entaris or ſwelling in the middle of the ſhaft is obſcurely mentioned by Vitruvius, and has been generally followed by modern architects.

COLUMN, *oval*. There are a few inſtances of oval columns in the remains of antiquity. The Maſſini Palace at Rome, and the frontiſpiece of the church of the P. P. de la Merci at Paris offer ſome modern examples.

COLUMN, *paſtoral*, that whoſe ſhaft is formed in imitation of the trunk of a tree, with bark and knots.

This kind of column, in the Tuſcan proportion, may be uſed in the gates of parks and gardens; and in the decoration of paſtoral ſcenes, &c.

COLUMN, *polygonous;* a column of which the horizontal ſection forms a polygon. There are various examples of this form in Egyptian architecture, it is alſo obſerved in the lower part of the columns of a portico on the iſland of Delos and at the temple of Cora.

COLUMN, *twiſted*, a column whoſe ſhaft is twiſted round in the manner of a ſcrew with ſix circumvolutions. Vignola firſt diſcovered a method of drawing it by rule. The barbarous and ridiculous practice of twiſting columns has been much uſed by modern architects, eſpecially in the ſcreens and altar-pieces of churches. The moſt celebrated inſtance is the Baldaquin of St. Peter's. Columns ſpirally fluted are ſeen in the temple of Spolets, they are alſo not unfrequent on the ſarcophagi's and other ornamental works of the lower ages.

COLUMN, *Corolitic*, that adorned with foliages, or leaves and branches turned ſpirally around the ſhaft; or in form of crowns and feſtoons.

Theſe were uſed by the ancients for erecting ſtatues on; which hence took the denomination of *corolitic*. They are very ſuitable in triumphal arches, and decorations of theatres.

COLUMN, *hermetic*. See HERMA.

COLUMNS, *denominated from their diſpoſition*.

COLUMN, *inſerted*, or *backed*, is that let into a well, a third or fourth part of its diameter.

COLUMN, *niched*, is that whoſe ſhaft enters, with half its diameter, into a wall, which is hollowed for its reception; with its plane parallel to the projecture of the tore. Such is that in the portal of St. Peter at Rome.

COLUMN, *angular*, is an inſulated column, placed in the coin, or corner of a portico; or inſerted into the corner of a building: or even a column that flanks an angle, either acute or obtuſe, of a figure of many ſides.

COLUMNS, *cantoned*, are thoſe engaged in the four corners of a ſquare pillar, to ſupport four ſprings of an arch.

COLUMNS, *coupled*, are thoſe diſpoſed, by two and two, ſo as almoſt to touch each other at their baſes, and capitals, as thoſe in the periſtile of the Louvre and at St. Paul's cathedral.

COLUMN, *doubled*, is an aſſemblage of two columns, joined in ſuch a manner, as that the two ſhafts penetrate each other with a third of their diameter. Such are thoſe of the four angles in the court of the Louvre.

COLUMN, *flanked*, according to M. Blondel, is a column engaged with one half, or at leaſt one-third of its diameter, between two demi-pilaſters.

COLUMNS, *grouped*, are thoſe placed on the ſame pedeſtal, or ſocle; either by three and three, or by four and four.

COLUMN, *inſulated*, is that ſtanding free, and detached on all ſides, from any other body.

COLUMNS, *median*. Vitruvius gives the name *columnæ medianæ* to the two columns in the middle of the porch, which have their intercolumniation larger than the reſt: that if theſe laſt, for inſtance, be *pycnoſtle*, the *medianes* are *euſtyle*.

The term may alſo be applied to the middle row of columns, in a frontiſpiece adorned with three orders.

COLUMNS, *denominated from their uſe*.

COLUMN, *aſtronomical*, is a kind of obſervatory, in form of a very high tower; built hollow, and with a ſpiral aſcent to an armillary ſphere placed at the top, for obſerving the motions of the heavenly bodies.

Such is that, of the Doric order, erected at the Hotel de Soiſſons, at Paris, by Catherine De Medicis, for the obſervations of Orontius Fineus, a celebrated aſtronomer of that time.

COLUMN, *chronological*, that which bears ſome hiſtorical inſcription, digeſted according to the order of time; as by luſtres, olympiads, faſti, epochas, annals, &c. At Athens there were columns of this kind, whereon were inſcribed the whole hiſtory of Greece digeſted into olympiads.

COLUMN, *funeral*, a column placed over a tomb, and bearing an urn, or ſome ſymbol or inſcription relating to the deceaſed. See CIPPUS.

COLUMN, *gnomonic*, is a cylinder, whereon the hour of the day is repreſented by the ſhadow of a ſtyle.

Of theſe there are two kinds: in the one, the ſtyle is fixed, and the hour-lines are no more than the projection of a vertical dial on a cylindrical ſurface.

In the other, the ſtyle is moveable; and the hour-lines are drawn to the different heights of the ſun, in the different ſeaſons of the year. See DIAL.

COLUMN, *indicative*, that which ſerves to ſhew the tides, &c. along the ſea-coaſts. Of this kind, is the nilometer at Grand Cairo, whereon the overflowings of the Nile are expreſſed: by this they form a judgment of the ſucceeding ſeaſon: when the water, for inſtance, aſcends to twenty-three feet, it is a ſign of great fertility in Egypt.

COLUMN, *itinerary*, a column with ſeveral faces, placed in the croſs-ways in large roads; ſerving to ſhew the different routs, by the inſcriptions thereupon.

COLUMN, *lactary*, at Rome, according to Feſtus, was a column erected in the herb-market, which is now the place Montanara; which had a cavity in its pedeſtal, wherein young children, abandoned by their parents out of poverty or inhumanity, were expoſed, to be brought up at the public expence.

COLUMN, *legal*. Among the Lacedæmonians there were columns raiſed in public places, whereon were engraven the fundamental laws of the ſtate.

COLUMN, *limitrophous*, or boundary, is that which ſhews the limits of a kingdom, or country conquered. Such was that, which Pliny ſays Alexander the Great erected at the extremities of the Indies.

As to thoſe of Hercules, ordinarily called his columns, or pillars; they are two very ſteep mountains in the ſtreights of Gades, now Gibraltar.

Column, *manubiary*, from the Latin *manubiæ*, *ſpoils of the enemy;* a column adorned with trophies, built in imitation of trees, whereon the ſpoils of enemies were anciently hung.

Column, *menian*, any column which ſupports a balcony, or meniana. The origin of this kind of column, Suetonius and Aſcanius refer to one Menias; who, having ſold his houſe to Cato and Flaccus, conſuls, to be converted into a public edifice, reſerved to himſelf the right of raiſing a column without-ſide, to bear a balcony; whence he might ſee the ſhows.

Column, *miliary*, was a column of marble, raiſed by order of Auguſtus, in the middle of the Roman Forum; from whence, as a centre, the diſtances of the ſeveral cities, &c. of the empire were reckoned, by other miliary columns diſpoſed at equal diſtances, on all the grand roads. This column was of white marble; the ſame with that which is now ſeen on the balluſtrade of the ſtaircaſe of the capitol at Rome. Its proportion is maſſive; being a ſhort cylinder, ſupporting a ſymbol of the globe of the earth.

It was called *milliarium aureum*, as having been gilt, at leaſt the ball, by order of Auguſtus. It was reſtored by the emperors Veſpaſian and Adrian; as appears by the inſcriptions.

Column, *military*, among the Romans, a column whereon was engraven a liſt of the forces in the Roman army, ranged by legions, in their proper order; with deſign to preſerve the memory of the number of ſoldiers, and of the order preſerved in any military expedition.

The Romans had another kind of military column, which they called *columna bellica*, ſtanding before the temple of Janus; at the foot whereof the conſul declared war, by throwing a javelin towards the enemies countries.

Column, *phoſphorical*, a light houſe; or a hollow column, built on a rock or the tip of a mole, or other eminence, to ſerve as a lantern to a port.

Column, *ſymbolical*, is a column repreſenting ſome particular country, by the attributes proper thereto; as that of the French order, ſet with *fleurs de lis*, in the frontiſpiece of the Jeſuits church at Rouen: or ſome memorable action; as the *Corvinian column*, on which was a crow; erected to Valerius Maximus, ſurnamed Corvinus, in memory of his defeat of a giant in the army of the Gauls, by the aſſiſtance of a crow.

Under the title of *ſymbolic columns*, may alſo be comprehended thoſe that ſerve for ſymbols. Such is that on a medal of Nero, which expreſs the ſtability of the Roman empire. See Symbol.

Columns, *hiſtorical, memorial, honorary, triumphal.* Under this head may be placed various diſtinguiſhed columns, which rank among the eminent works of art ancient and modern, and form the chief ornaments of the ſituation in which they are placed. The moſt celebrated of theſe is the triumphal column of Trajan at Rome. This monument was built by Apollodorus the moſt famous Roman architect in the Forum Romanum. The height of the column is 106 feet, with a diameter of nearly 13 feet; it is placed on a pedeſtal of 19 feet high; upon the capital there is a crowning which formerly ſupported a ſtatue of the emperor, but, at preſent, a bronze ſtatue of St. Peter, about 14 feet in height. The baſe and capital are of the Tuſcan order. The column, with the crowning, is compoſed of 34 tamboons or blocks of white marble, and the ſhaft is adorned, mounting ſpirally from top to bottom, repreſenting the victories of Trajan over the Dacæ. Four eagles at the corners of the pedeſtal ſupport, in their beaks, feſtoons of laurel, and the ſides of the pedeſtal are richly ornamented with a variety of military weapons. The inſide of the column contains a ſtaircaſe, which aſcends to the capital, and as each block of ſtone forms the whole diameter of the ſhaft, the ſteps are wrought out of the ſolid.

The Antonine column, though inferior in deſign, and the beauty of ſculpture to the laſt mentioned, is one of the moſt conſiderable monuments of ancient Rome. It was erected by Marcus Aurelius, and conſecrated by him to Antoninus Pius, whoſe ſtatue was placed upon the ſummit, on the ſhaft however are repreſented the action of Marcus in the Marcoman war. The column is $96\frac{1}{2}$ feet in height, with a diameter of $11\frac{1}{2}$, raiſed upon a pedeſtal of $26\frac{1}{2}$ feet. The conſtruction of this column is exactly ſimilar to that of Trajan; its baſe and capital have Doric profile.

At Alexandria there is a remarkable column, which is commonly called Pompey's pillar. It is a column of the Corinthian order raiſed upon a ſhort pedeſtal. The ſhaft is 67 feet long, and nearly nine feet in diameter, at the bottom of a ſingle piece of granite. The whole height of the column and pedeſtal is about 94 feet.

At Conſtantinople there were two triumphal columns ſimilar to thoſe of Trajan and Antoninus; the column of Conſtantine is entirely deſtroyed, and of the other erected to Arcadius by Theodoſius, only the pedeſtal and the firſt courſe of the ſhaft remains.

Laſtly, may be mentioned the monument of London, which is the largeſt column in exiſtence, being fifteen feet in diameter, and 202 feet high, including the pedeſtal and crowning. This column was erected in memorial of the great fire of London; its architect was Sir C. Wren.

Column, *roſtral*, a triumphal column adorned with the beaks or prows of galies, in memorial of a naval victory. The firſt roſtral column was erected in the capitol, on occaſion of the defeat of the Carthaginians by C. Duillius. Auguſtus conſtructed four with the prows of the ſhips taken from Cleopatra.

Column, *Scenography of.* See Scenography.

Column, in French *Colonne.* Column has been very erroneouſly defined by many writers on military ſubjects to be a long deep file of troops or baggage. This definition, confining a column to a file of troops, ſo far from giving a true idea of it, conveys one totally erroneous. For a column conſiſts both of ranks and files. A column may, therefore, be defined to be a corps or body of men with ranks and files in the form either of a ſquare or rectangle, who march in time, or with one and the ſame movement, leaving a ſufficient interval between every two of the ſaid ranks and files, in order to avoid confuſion. A column may be in the form of a ſquare, having its front equal to its depth; or it may be of a rectangular form, having either its front equal to one of the ſhorteſt ſides of the rectangle, and its depth equal to one of the longeſt, or its front equal to one of the longeſt ſides of the rectangle, and its depth equal to one of the ſhorteſt.

In marching troops in columns, particularly towards the enemy, great care ſhould be taken, that they advance as nearly as poſſible alike, and not one before another, that they may, if attacked, be able to afford mutual aid and aſſiſtance to one another, and that as they approach the field of battle they preſerve their diſtances with ſo much accuracy, that when they wheel and form there may be neither too much nor too little ground for each ſquadron and battalion. This is a nice point, and an operation that is ſeldom executed correctly.

The moſt diſadvantageous order of march is that which compels an army to move in one column. The more columns it is divided into, and the ſmaller their depth, the more eaſily and expeditiouſly are the troops compoſing them formed in order of battle. And the moſt advantageous method of marching an army is that which makes it move in order of battle, without dividing it into columns at all. But open, level, and unembarraſſed ground of ſufficient extent for this purpoſe is rarely to be met with.

Column. *Cloſe*, a ſolid compact column, with very little ſpace or intervals between the diviſions compoſing it.

Column, *Open*, a column with intervals between the the diviſions equal commonly to their reſpective fronts.

Column, among *Printers*, is half a page, when the page is divided into two parts, from top to bottom. See Printing.

COLUMNA, Fabius, in *Biography*, a learned botaniſt, was born at Naples in 1567. He attached himſelf early to the ſtudy of natural hiſtory, particularly to acquire a knowledge of the properties of plants, in which he became eminent. He excelled alſo in the knowledge of languages, of muſic, of mathematics, and in drawing, of which he is ſaid to have made much uſe, the greater part of the engravings in his works being taken from his own deſigns. He was led to ſtudy the works of Dioſcorides, Boerhaave ſays, in order to find a remedy for eliptic fits, to which he was ſubject. That he was not ſucceſsful in his ſearch is probable, as he is ſaid to have received the greateſt benefit, having previouſly tried numerous medicines, by the application of a cauſtic to one of his thighs. The operation was performed by Severinus in the year 1630. He died in 1651, aged 83 years, and is ſaid to have totally out-lived his faculties. Haller gives him great credit as a reviver and improver of the ſtudy of botany, for the light he threw on many obſcure paſſages in Dioſcorides, and for the number of plants he deſcribed not before known. The figures of the plants he has given, which he generally aſſiſted in executing, are among the earlieſt copper-plate engravings in that part of natural hiſtory. His firſt work, which was publiſhed when he was only 24 years of age, "Plantarum aliquot hiſtoria, in qua deſcribuntur plantæ rariores, antiquorum delineationibus reſpondentes." Neap. anno 1592, 4to. far exceeding what had been before done in that line. The engravings alſo are more accurate than had been before ſeen. "In phu (the wild valerian) characterem exacte expreſſit." Haller ſays, it is the plant, the root of which, Dioſcorides recommended in his complaint. He took of it for a long time with advantage, he ſays, but it did not effect a cure. The works were republiſhed in 1744, 4to. by James Plaucus, with obſervations by the Lyncei, a ſociety of naturaliſts, to which Fabius had belonged. Annexed is a ſhort hiſtory of his life. "Minus cognitarum rariorumque noſtro cælo orientium ſtirpium, ecphraſis qua non paucæ ab antiquioribus deſcriptæ diſquiruntur, et declarantur," Rome, 4to. This was prepared for the preſs in the year 1606. The dedication was written in the year 1610, but it did not appear until the year 1616. He now delineated the flowers, fruits, and ſeeds of the plants, and began to arrange them from the ſimilitudes of thoſe parts. A ſecond part of this work ſoon followed. In 1627, his "Adnotationes, et additiones ad opus Franciſci Hernandes, et Nardi Antonii Recchi" appeared. In this he makes further advances in the claſſification of plants, from the reſemblance of the petals. "Stylum et ſtamina novit." In his work appear the firſt dawning of the ſyſtem, by which Linnæus, more than a century afterwards, became immortalized. He was a member of the illuſtrious academy of the Lincei, eſtabliſhed at Rome, which rendered great ſervices to the republic of letters as long as it ſubſiſted. Columna invented a muſical inſtrument, which he called "Sambuca Lyncia," from the name of his academy; it was compoſed of 500 ſtrings of different lengths, and the tone of each was divided in four parts, according to the method of Ariſtoxinus, to include all the genera, diatonic, chromatic, and enharmonic. He publiſhed his invention in a work likewiſe entitled "Sambuca Lyncia," printed at Naples in 1618. Some later editions were publiſhed under the title, "Dell' inſtrumento perfetto." We make no reflections on the excellence of this inſtrument, having never ſeen it; but conjecture, that from the belly being loaded with ſo great number of ſtrings, the tone muſt be very feeble; it muſt likewiſe have been difficult to tune for all the three genera, and ſtill more difficult to keep in tune. Haller Bib. Botan. Eloy. Dict. Hiſt.

Columna *naſi*, is uſed by ſome writers of anatomy, for the fleſhy end of the noſe, jutting out over the upper lip.

Columna *oris*, is ſometimes uſed for the uvula.

Columna *regia*, in *Ancient Geography*, a place of Italy, over-againſt Sicily, on the bank of the ſtrait, and near Regium Julium. It is mentioned in the Itinerary of Antonine.

COLUMNÆ, a name given by Ephorus, cited by Pliny, to a ſmall iſland on the route from the Red Sea to the iſland of Cerne. G. Hardouin thought they were the Maſcarenhas iſles.

Columnæ *albæ*, or white columns, called by Herodotus (l. v. c. 118.) λευκαι ϛηλαι, a place of Aſia Minor, to the ſouth of the river Marſias, and very near it.

Columnæ *carneæ*, in *Anatomy*, called alſo *lacertuli*, and *columnæ cordis*, are ſeveral ſmall muſcles in the ventricles of the heart; derived, and, as it were, detached from the parieties of thoſe ventricles, and connected by tendinous extremities to the valves of the heart.

Theſe little columns, or pillars, being faſtened to the parietes of the heart on one ſide, and the tricuſpid and mitral valves on the other, do, by the contraction in the ſyſtole of the heart, draw out the valves; and by that means not only ſhut the orifices of the veins, but more exactly cloſe the ventricles in their ſyſtole.

Columnæ *herculis*, the columns of Hercules, in *Ancient Geography*, the name given to the ſtrait of Gibraltar, called alſo *Fretum Gaditanum* and *Fretum Herculæum*. Theſe columns of Hercules were properly the two mountains of Calpe in Europe, and of Abyla in Africa. Some have ſuppoſed that Hercules called them by his name; but others conſider Hercules as an imaginary hero, whoſe name is formed of the Phœnician "Harokel," ſignifying a merchant or voyager. Hence, they ſay, it is not aſtoniſhing, that this ſtrait ſhould be called "the Strait of Voyagers," and that its name ſhould be derived from the Phœnician language, ſince the Phœnician navigators had made it known, and continually ſailed through it.

COLUMNAR *Marble*. See Basaltes.

Columnar *ſtrata*, a mineralogical term for the priſms into which different ſtrata of the earth are ſometimes found ſplit or divided, generally in a direction perpendicular to the lamina of the ſtrata or nearly; theſe moſt commonly occur in baſalt or trap, thoſe of Stople in Saxony, exceed 300 feet in length, without any articulation or diviſion. Dolomien obſerved columnar baſalt in the ſtrata of mount

Etna. At Caſtleton in Derbyſhire, Mr. Mawe obſerved an irregular column in the Toad ſtone or trap (Mawe's Derb. p. 40 and 51). Porphyry is often found in a columnar form, ſee 2 Berg. Journ. 1790, 325, and Haiding, 48. Sand-ſtone in the eaſt and north parts of Bohemia, are often ſplit into columns, reſembling baſalts, 2 Berg. Journ. 1792, 70. Lime-ſtone is ſometimes found rent into polygonal pillars of 4, 5, &c. ſides like baſalts, as at Ruoms and Ridon in the Vivarois, and in Saxony. Charpentier 49. See Basalt, Trap and Prismatic *columnars*.

COLUMNARIS, in *Botany*, a name given by ſome to the tail, milky bell-flower; the *campanula lacteſcens*, Ger. Emac. Ind. 2.

COLUMNARIUM, in *Roman Antiquity*, a heavy tribute, demanded for every pillar of a houſe. It was firſt laid on by Julius Cæſar, in order to put a ſtop to the extravagant expences laid out on ſumptuous buildings.

COLUMNEA, in *Botany*, (ſo named by Plumier in honour of Fabius Columna, or Fabio Colonna, of the noble family of Colonna in Italy,) Linn. Gen. 792. Schreb. 1064. Willd. 1210. Plum. 33. Juſſ. 121. Claſs and order, *didynamia angioſpermia*. Nat. Ord. *Perſonatæ*, Linn. *Scrophulanæ*, Juſſ.

Gen. Ch. *Cal.* One-leafed, deeply five-cleft, generally ſomewhat ſwelling at the baſe, permanent; ſegments erect, equal, lanceolate. *Cor.* monopetalous, much longer than the calyx, labiate; upper lip erect; lower lip two or three-cleft. *Stam.* Filaments four free; anthers joined together. *Piſt.* Germ ſuperior, egg-ſhaped; ſtyle filiform, the length of the upper lip; ſtyle bifid, obtuſe. *Peric.* Capſule globular, one or two-celled. *Seeds* numerous, ſmall, attached to a large receptacle.

Eſſen. Ch. Calyx five-cleft. Corolla labiate; upper lip erect, emarginate; lower lip three-cleft. Anthers connected. Capſule, one or two-celled. *Seeds* bedded in the receptacle.

Sp. 1. C. *Scandens.* Linn. Sp. Pl. Mart. 1. Lam. 1. Willd. 1. Jacq. Hort. vol. iii. tab. 48. Amer. Pict. 38. tab. 170. Plum. Gen. 28. ic. tab. 89. fig. 1. Lam. Ill. tab. 524. fig. 1. "Leaves egg-ſhaped, acute, entire or ſlightly crenated, ſomewhat villous; calyx pubeſcent; ſegments entire; corolla pubeſcent; upper lip undivided." *Root* perennial. *Stem* ſlender, very long, pale green, ſlightly villous, either creeping on the ground, or attaching itſelf to the trunks of trees, by ſmall lateral roots. *Leaves* oppoſite, petioled, reſembling thoſe of Parietaria. *Flowers* blood-red, two inches long, axillary, ſolitary, villous on the outſide, on ſhort peduncles, a little curved. *Capſule* globular, white, ſoftiſh, reſembling a berry, but opening, about the ſize of a nut, one-celled. A native of South America, and the Weſt Indies. There is a ſeminal variety with yellowiſh flowers. 2. C. *longifolia.* Linn. Mant. 90. Mart. 2. Lam. 3. (Achimenes ſeſamoides; Vahl. Symb. 2. 71. Willd. 1190. Babel. Tſiuli. Rheed. Mal. 9. tab. 87. Seſamum javanicum; Burm. Ind. 133.) "Leaves lanceolate, very long, ſomewhat ſerrated, ſmooth." *Stem* about two feet high, herbaceous, quadrangular, ſmooth, branched. *Leaves* three inches long, oppoſite, nearly ſeſſile. *Flowers* red, oppoſite; in ſimple, long, erect, terminal racemes; border of the corolla four-cleft; upper lip large, oblong, entire; lower lip trifid; anthers divided at the baſe into two diverging lobes, connected, and forming a croſs. *Capſule* egg-ſhaped, two-celled, two valved. *Seeds* numerous, fixed in a globular receptacle. A native of the Eaſt Indies. 3. C. *hirſuta.* Mart. 3. Willd. 2. Hort. Kew. 2. 366. Lam. Ill. tab. 524. fig. 2. Swartz. Prod. 94. Flor. Ind. occ. 2. 1080. (Achimenes major; Brown. Jam. 270. tab. 30. fig. 3. Rapunculus [illegible]; Sloan. Jam. 58. Hiſt. 1. tab 100. fig. 1.) "Leaves egg-ſhaped; acuminate, ſerrated, rough, with hairs on the upper ſurface, ſegments of the calyx tooth-ſerrated, hirſute; corolla hirſute; upper lip bifid." *Root* perennial. Whole plant ſucculent. *Stem* thick, throwing its branches to the height of four or five feet when ſupported. *Leaves* oppoſite alternately larger. *Flowers* large, beautifully variegated; ſegments of the calyx almoſt pinnated like thoſe of the roſe. A native of the cooler mountains of Jamaica; introduced in 1780. by the marquis of Rockingham; flowering in November. 4. C. *hiſpida.* Mart. 4. Willd. 4. Swartz. Prod. 94. Flor. Ind. occ. 2. 1083. "Leaves egg-ſhaped, obtuſe, ſlightly toothed, hiſpid hirſute; ſegments of the calyx entire, hairy; ſtem hairy, ſcabrous." A native of Jamaica. 5. C. *natilans.* Mart. 5. Willd. 3. Swartz. Prod. 94. Flor. Ind. occ. 2. 1083. "Leaves ovate-lanceolate, ſlightly toothed, rather ſcabrous, hirſute and coloured underneath; calyx villous; ſegments laciniated; corollas villous." A native of Jamaica, in ſhady woods, attached to the trunks of trees. 6. C. *ſtellata.* Willd. 6. Lour. Cochin. 384. "Leaves ſtillate; flowers ſolitary; ſtem creeping." *Stem* herbaceous, perennial, cylindrical, ſlender, whitiſh. *Branches* ſomewhat erect, four inches long, very tender. *Leaves* egg ſhaped, three lines long, ſerrated, ſtellate in threes, pale green, odoriferous, petioled. *Flowers* white, ſtriped with red, axillary, hirſute, peduncled; tube of the corolla ſcarcely gibbous; upper lip arched, trifid; lower bifid; anthers egg-ſhaped, connected, ſeparated with difficulty. *Capſule* awl-ſhaped, two-celled. The whole plant, except the capſule, hairy. A native of Cochin-china. It is an aquatic, of a very pleaſant appearance and ſmell, and being emollient and cooling, is uſed as a waſh by the women, for which purpoſe it is cultivated in pots or tubs filled with water, having earth at the bottom.

Columnea *erecta*; Lam. See Cyrilla *pulchella.*

Propagation and Culture. All the ſpecies require the heat of a ſtove. They are propagated by ſeeds, and ſhould be treated like other tender exotics.

COLUMNELLA, *little column*, denotes the ſubſtance that paſſes through the capſule, and connects the ſeveral partitions and ſeeds.

COLUMNIA Pompei, in *Ancient Geography*, a place of Thrace, at the entrance of the Thracian Boſphorus, on the coaſt of the Euxine ſea.

COLUMNIATED *winding ſtairs.* See Stairs.

COLUMNIFERÆ, in *Botany*, the thirty fourth natural order in the "Philoſophia Botanica," of Linnæus, and the thirty-ſeventh of "Prælections." In the "Philoſophia Botanica," it contains the following genera; camellia, xylon, goſſypium, urena, hibiſcus, turnera, malope, lavatera, althæa, alcea, malva, melochia, ſida, napæ, waltheria, mentzelia, hermennia, helicteres, and ſtewartia. In the Prælections all theſe are continued, except mentzelia, which is removed to the calycanthemæ; and xylon, which was ſuppreſſed as a diſtinct genus by Linnæus himſelf, and its ſpecies placed under bombax. The following are added by Linnæus, triumfetta, bixa, corchorus, theobroma, grewia, muntingia, tilia, all of which originally formed part of the now ſuppreſſed order culmineæ; and beſide theſe, malachra? pentapetes, bombax, adanſonia, heliocarpus, antichorus, mahernia, kleinhovia, ayenia, microcos, thea, kiggelaria. Sterculia is placed by Linnæus under both the columniferæ and the tricoccæ. In the "Philoſophia Botanica" it had been placed among the latter, and when it was afterwards removed to the former, it was moſt probably left in its original ſtation, merely through inadvertence. The following have ſince been added; but Giſeke acknowledges himſelf in doubt whether the arrangement would in all caſes have been approved by Linnæus. Symplocos, Linn., and ternſtroemia, Linn., referred to this order by Swartz.; palavia, Cav.: anoda, Cav.; ruizia, Cav; aſſonia, Cav.; dombeya, Cav.; ochroma, Swart.; paronia, Cav; achania, Sol. Swart.; (malvaviſcus, Dill. Cav.) Lagunæa, Cav.; cienfugoſia, Cav.; myrodia, Swart. (Quararibea, Aubl. Cav.), aubletia, Schreb. (Apeiba, marcgr. Aubl. Swart.) Marila, Swart.; bubroma, Schreb.; malacodendron, Mitch. Cav. eroteum, Swart.

Linnæus confeſſes that the eſſential character of the order is not to be underſtood from the name, which properly belongs only to ſome of the more remarkable genera. In all of them the root is fibrous; in none bulbous or tuberous. The ſtem in moſt is herbaceous, but ſome are large trees; it is amongſt the latter only, that thorns are to be found, and prickles only in ſome hibiſci. Scarcely any plant in the whole order is ſmooth. All have ſtipules in pairs. The leaves are never oppoſite, moſt commonly petioled; the foliation, as far as Linnæus could recollect, always plaited, and many have glanduliferous pores under the rib. There are no tendrils in any plant of the order. The infloreſcence is various. The calyx in many is ſimple and five-cleft; in ſome double. The petals in moſt are five; but ſince the filaments are united, and in moſt genera adhere to them, the corolla falls off all together, as if it conſiſted only of one petal. Their claws, by converging often, conſtitute the nectary. The piſtils, or at leaſt the ſtigmas, are equal in number to the parts of the fruit. The fruit is always ſuperior, but various in other reſpects. None of the ſpecies are poiſonous or fetid; they are generally more or leſs mucilaginous; and the flowers of moſt are beautiful.

COLUMPNATENSIS, in *Ancient Geography*, an epiſcopal ſee in Africa in Mauritania Cæſarienſis, according to the conference of Carthage.

COLUPPA, in *Botany*, Rheed. See ILLECEBRUM *ſeſſile*.

COLURES, in *Geography* and *Aſtronomy*, are two great circles, imagined to interſect each other at right angles in the poles of the world.

The word is derived from κολος, *mutilus*, or *truncatus*, and ȣρα, *tail*; q. d. *appearing with the tail cut off*; becauſe never ſeen entire above the horizon.

The colures paſs one of them through the ſolſtitial, and the other through the equinoctial point of the ecliptic; whence the firſt is denominated the *ſolſtitial*, and the ſecond *equinoctial colure*.

The equinoctial colure determines the equinoxes; and the ſolſtitial, the ſolſtices.

By thus dividing the ecliptic into four equal parts, they alſo mark the four ſeaſons of the year.

It is diſputed over what part of the back of Aries the equinoctial colure paſſed in the time of Hipparchus. Sir Iſaac Newton, in his Chronology, takes it to have been over the middle of the conſtellation. Father Souciet inſiſts on its having paſſed over the dodecatemorion of Aries, or midway between the rump and firſt of the tail. We have ſome obſervations in the Philoſophical Tranſactions, N° 466, concerning the poſition of this colure in the ancient ſphere, from a draught of the conſtellation Aries, in the Aratæa publiſhed at Leyden and Amſterdam, 1652, which ſeem to confirm ſir Iſaac's opinion; but the antiquity and authority of the original draught may ſtill remain in queſtion. See CHRONOLOGY.

COLURI, in *Geography*, an iſland in the gulf of Engia, near the coaſt of Livadia, about ſeven miles long and two wide; 10 miles W. of Athens. N. lat. 38°. E. long. 23° 36′.

COLUSITANUS, in *Ancient Geography*, an epiſcopal ſee in the proconſular Africa, according to the conference of Carthage; ſuppoſed to be the ſame with *Calcitanenſes*.

COLUSSA, a Greek town of Paphlagonia.

COLUTEA, in *Botany*, (Κολουτεα, the name of a plant in Theophraſtus). Tourn. Claſs 22. ſect. 3. Gen. 2. Linn. Gen. 880. Schreb. 1196. Willd. 1365. Gært. 488. Juſſ. 359. Vent. 3. 412. Baguenandier; Encyc. Claſs and order, *diadelphia decandria*. Nat. Ord. *Papilionaceæ*, Linn. *Leguminoſæ*, Juſſ. Vent.

Gen. Ch. *Cal.* Perianth one-leafed, bell-ſhaped, five-cleft, erect, permanent. *Cor.* Papilionaceous. Standard, wings and keel differing in different ſpecies with reſpect to number and proportion. *Stam.* Filaments nine united; one ſeparate; anthers ſimple. *Piſt.* Germ ſuperior, oblong, compreſſed peduncled; ſtyle aſcending; ſtigma bearded on the lower ſide. *Peric.* Legume very large, membranous, tranſparent, generally inflated, appearing almoſt empty, perfectly one-celled. *Seeds* ſmall, kidney-ſhaped, attached to the two edges of the upper ſuture.

Eſſ. Ch. Calyx five-cleft. Stigma bearded on one ſide. Legume peduncled, membranous, inflated or compreſſed, one-celled.

Obſ. This ſpecies is nearly allied to aſtragalus and phaca. The total want of a partition in the legume is its only certain generic diſtinction. The aſtragali are completely two-celled. The phacæ have a partial partition, which extends the whole length, but only half the breadth of the legume, making it ſemi-bilocular.

Sp. 1. C. *arboreſcens*. Common bladder-ſenna. Linn. Sp. Pl. 1. Mart. 1. Lam. 1. Willd. 1. Gært. tab. 154. fig. 4. Lam. Ill. 624. fig. 2. Bot. mag. tab. 81. (C. veſicaria; Bauh. Pin. 396. Tourn. 649. C. hirſuta; Roth. Germ. I. 305. II. 168.) "Leaflets inverſely heart-ſhaped." Linn. "Leaflets oval-obcordate; ſtandard gibbous, abbreviated." Hort. Kew. A ſhrub. *Stems* ſeveral, woody, twelve or fourteen feet high; branches numerous, woody. *Leaves* alternate, winged, terminated by an odd one; leaflets nine or eleven, green and ſmooth above, glaucous underneath. *Flowers* yellow, with a reddiſh curved line at the baſe of the ſtandard, in a ſhort raceme, conſiſting of three or four flowers; wings only a little ſhorter than the keel. *Legume* cloſed at the tip. *Seeds* twenty or more. A native of the warmer parts of Europe; obſerved by Mr. Ray, in the aſcent to the crater of mount Veſuvius, where there are ſcarcely any other plants. It flowers with us in the early part of June, and ſometimes again in the month of Auguſt, continuing till October. Both leaves and legumes are purgative, and may be ſubſtituted for the officinal ſenna, (caſſia ſenna,) but muſt be taken in larger doſes. They have an acrid, nauſeous taſte. The ſeeds, in the quantity of a dram or two excite vomiting: but notwithſtanding theſe qualities, the plant is ſaid by Haller and Ray to afford a food grateful to cattle. 2. C. *cruenta*. Oriental bladder ſenna. Mart. 2. Willd. 2. L'Heretier Stirp. nov. 2. tab. 41. Hort Kew. 3. 55. Lam. Ill. tab. 624. fig. 3. (C. orientalis, flore, ſanguinei coloris, luteâ maculâ notato. Tourn. Cor. 44. C. ſanguinea. Pal. roſſ. 1. 88. C. orientalis. Lam. 2. C. humilis. Scop. inſubr. 2. 23: tab. 12) "Shrubby; leaflets wedgſhaped, inverſely heart-ſhaped; ſtandard gibbous, obtuſe, very ſmall." *Stem* woody; branches ſeven or eight feet high. *Leaves* pinnated; leaflets eleven or thirteen, ſmall, ſmooth, glaucous, more fleſhy than thoſe of the preceding ſpecies.

Flowers deep red, with two yellow ſpots on the ſtandard, ſmall; wings conſiderably ſhorter than the keel; keel erect, appearing cut off at the end. *Legume* opening beneath the tip into a wide hole. Diſcovered by Tournefort in the Levant; cultivated by Miller in 1752. 3. C. *pocockii.* Pocock's bladder-ſenna. Mart. 3. Willd. 3. Hort. Kew. 3. 55. (C. procumbens; L'Heretier Stirp. nov. 2. tab. 42. C. halepica; Lam. 3.) "Shrubby; leaflets roundiſh-elliptical, very obtuſe, mucronate; ſtandard gibbous, elongated, aſcending." A lower ſhrub than the preceding. *Branches* ſlender, ſpreading. *Leaflets* thirteen or fifteen, very ſmall, entire, of a cinereous-green colour underneath. *Flowers* bright yellow, larger than thoſe of C. arboreſcens, opening a month earlier, and continuing in ſucceſſion till late in the autumn; peduncles ſhorter than the leaves, axillary, ſolitary, one or two-flowered. The ſeeds were firſt brought to England from Turkey, by Dr. Pococke, and are ſaid by Dr. Ruſſell to be very common about Aleppo. 4. C. *fruteſcens.* Scarlet bladder-ſenna. Linn. Sp. Pl. 2. Mart. 4. Lam. 4. Willd. 4. Bot. Mag. tab. 181. "Leaflets oblong, retuſe, hoary underneath; branches ſilky-tomentous." A ſhrub, from two to four feet high; branches erect. *Leaflets* from twenty-one to twenty-five, green and ſmooth on their upper ſurface. *Flowers* bright ſcarlet large; peduncles axillary, from three to five-flowered; keel conſiderably longer than the ſtandard; wings very ſmall. *Legumes* very large. A native of the Cape of Good Hope, and other parts of Africa. 5. C. *americana.* Mart. 8. Houſt. MSS. "Shrubby; leaflets egg-ſhaped, emarginate; legumes oblong, compreſſed, acuminate." *Stem* twelve or fourteen feet high, much branched; leaflets ſeven, light green. *Flowers* bright yellow, two or three upon each peduncle. *Legumes* near four inches long, compreſſed, winged, ending in long points. Sent to Miller in 1730, by Dr. Houſton, from Vera Cruz in New Spain. 6. C. *galegifolia.* Bot. Mag. tab. 792. "Shrubby; leaflets oval, emarginate, in about nine pairs, with a terminal one; legumes on longiſh pedicels." *Stem* low, zig-zag; branches herbaceous, angular. *Stipules* two, egg-ſhaped, ſmall, embracing the common petiole, but diſtinct from it. *Flowers* dull red, inclining to orange, in a many-flowered raceme; common peduncles longer than the leaves, axillary; pedicels alternate, ſhort, curved; bracte under each flower, ſingle, ſmall, egg-ſhaped; calyx-teeth wide at the baſe, with white villous margins; ſtandard roundiſh, ſomewhat reflexed, marked at the baſe with a greeniſh yellow ſpot; wings ſmaller than the keel; keel one-petalled, when folded nearly orbicular; ſtyle hairy on the upper ſurface of its whole length. *Legume* inflated, membranous, veined, oblong, oval, beaked, on a pedicel four times longer than the calyx. *Seeds* many, ſhining, kidney-ſhaped. A native of New South Wales. 7. C. *procumbens.* Mart. 9. "Stems trailing; leaflets oblong, egg-ſhaped, tomentous; flowers axillary, on very long peduncles." *Stems* ſeveral, woody, ſlender, much branched; branches not much more than a foot long; leaflets twenty-five or twenty-ſeven, ſmall, narrow. *Flowers* purple, ſmall; peduncles with three or four flowers. *Legumes* little more than half an inch long, but like a ſickle, compreſſed. *Seeds* kidney-ſhaped. A native of the Cape of Good Hope. Cultivated by Miller in 1753. 8. C. *rigida.* Willd. 5. Thunb. prod. 134. "Shrubby; leaflets lanceolate, ſmooth; ſtem erect, ſmooth. A native of the Cape of Good Hope. 9. C. *obtuſata.* Willd. 6. Thunb. prod. 134. "Shrubby; leaflets linear; ſtem erect; flowers in racemes, reflexed." A native of the Cape of Good Hope. 10. C. *linearis.* Willd. 7. Thunb. prod. 135. "Herbaceous; leaflets linear, acute; ſtem erect; racemes terminal, incurved." A native of the Cape of Good Hope. 11. C. *herbacea.* Linn. Sp. Pl. 3. Mart. 6. Lam. 5. Willd. 8. Gært. tab. 154. fig. 2. "Leaflets linear, emarginate, ſmooth; ſtem herbaceous; racemes axillary." *Roots* annual or triennial. *Stem* near a foot and half high, clothed with very ſhort hairs, branched. *Leaflets* fifteen or ſeventeen, greeniſh. *Flowers* dark blood-red, ſmall; ſtandard ſtriated, the length of the wings and keel. *Legumes* ſmall, membranous, ſomewhat tranſparent, very thin, compreſſed, egg-ſhaped, obliquely mucronate, two valved, peduncled. *Seeds* two or four, rather large, kidney-ſhaped, compreſſed, of a dull cheſnut colour. A native of the Cape of Good Hope; cultivated by Miller in 1731. 12. C. *perennans.* Mart. 5. Willd 9. Hort. Kew. 3. 56 Jacq. Hort. 3. tab. 3. (C. fiſtuloſa; Retz. Obſ. 3. 40. Mart. 7.) "Herbaceous; leaflets oblong, pubeſcent; ſtem erect; racemes terminal." *Root* perennial. Whole plant ſlightly pubeſcent. *Stem* cylindrical, ſtriated, pale green, annual, ſimple, or with almoſt barren branchlets. *Leaves* alternate, near together, ſpreading; leaflets from thirteen to ſeventeen, entire, obtuſe, on very ſhort petioles. *Flowers* fleſh-coloured, ſmall, without ſcent; ſtandard wide, roundiſh, emarginate, marked with deep purple ſtreaks; wings ſhorter than the keel, oblong, obtuſe; keel dark purple, aſcending at the end, almoſt as long as the ſtandard; ſtyle ſmooth; ſtigma obtuſe, with white villous hairs, but bearded only at the tip. *Legume* ovate-roundiſh, acuminate at both ends, compreſſed, flat, little inflated, ſmooth, membranous, ſomewhat pellucid, not opening of itſelf. *Seeds* few, compreſſed black. A native of the Cape of Good Hope; introduced by Dr. Jacquin in 1776. 13. C. *proſtrata.* Willd. 10. Thunb. prod. 134. "Leaflets lanceolate, villous; ſtem herbaceous, diffuſe; peduncles axillary, with about two flowers." A native of the Cape of Good Hope. We ſhould have ſuppoſed this to be C. procumbens taken up by profeſſor Martyn from Miller, if Miller had not expreſsly aſſerted that his plant has woody ſtems. 14. C. *exciſa.* Willd. 11. Thunb. prod. 134. "Leaflets egg-ſhaped, cut; ſtem herbaceous, decumbent; racemes terminal." A native of the Cape of Good Hope. 15. C. *veſicaria.* Willd. 12. Thunb. prod. 134. "Leaflets egg-ſhaped; ſtem herbaceous, decumbent villous; legumes orbicular, inflated." A native of the Cape of Good Hope. 16. C. *tomentoſa.* Willd. 13. Thunb. prod. 135. "Leaflets egg-ſhaped, hoary; ſtem herbaceous, tomentous; flowers in racemes. A native of the Cape of Good Hope. 17. C. *alpina.* Lam. 6. (Phaca alpina; Linn. P. leguminibus pendulis ſemiovatis; Gmel. Sib. 4. 35. tab. 14. Aſtragulus; Hall. Helv. n. 401. Aſtragaloides elatior, erecta, viciæ foliis, ſiliquis pendulis. Amon. Ruth. 148.) "Herbaceous, much branched; leaflets oblong, elliptical, hairy underneath; flowers pale yellow." *Root* perennial. *Stems* near a foot and half long, weak, ſometimes quite upright, ſometimes half decumbent and diffuſe. *Leaflets* nineteen or twenty-one, green and ſmooth above, diminiſhing in ſize towards the top. *Flowers* yellowiſh, in peduncled ſpikes, ſituated in the axils of the upper leaves; calyx beſet with a few ſhort blackiſh hairs. *Legumes* veſicular, perfectly one-celled, pedicelled in their calyx, demi-oval, or a little creſcent-ſhaped, acute, pendulous on the common peduncle. *Seeds* from four to ſix, ſmall, kidney-ſhaped. A native of the mountains of Dauphiné, Switzerland, Lapland, and Siberia. 18. C. *auſtralis.* Lam. 7. (Phaca auſtralis, Linn.; aſtragalus. Hall. Helv. p. 403. Aſtragaloides alpina ſupina glabra, Till. Hort. Pin. 19. tab. 14. fig. 1.) "Herbaceous, diffuſe; leaflets lanceolate, nearly ſmooth; peduncles longer than the leaf." *Root* perennial. *Stems* from five to ſeven inches long, ſlender, weak, commonly procumbent, almoſt ſmooth, branched. *Leaflets* thirteen or fifteen, acute. *Stipules* two, embracing the ſtem, oval-obtuſe. *Flowers* yellowiſh white, with a tint of violet at the extremity of the keel, ſeſſile, in axillary ſpikes. *Legumes* veſicular, demi-oval, pedicelled in their calyx, terminated by a ſhort bent thread, perfectly one-celled, ſmooth, not pendulous. *Seeds* five or ſix, ſmall. A native of the mountains of Provence, Italy, and Switzerland. After ſome heſitation, we have placed the laſt two ſpecies under this genus, in concurrence with La Marck, although that botaniſt has not, in this particular, been hitherto followed by any other author. Gærtner has even figured the legume of this ſpecies alone, to illuſtrate the genus phaca. As far, however, as the partition is concerned, he compleatly gives up the point, acknowledging the legume to be abſolutely one-celled, without a veſtige of a partition. He has accordingly introduced *aut rarius unicolare*, into his generic character, and has founded the eſſential diſtinction between colutea and phaca on the form of the flowers. To us the entire want of a partition appears deciſive. Jacquin, indeed, has attributed to his alpina a half two-celled legume; but he ſeems to refer to a different plant. There is much confuſion in authors with reſpect to the ſynonyms of phaca-alpina; and that with the kindred ſpecies, ſtands in need of further inveſtigation.

Colutea *argentea cretica*; Tourn. See Coronilla *argentea*.

Colutea *caule geniſtæ fungoſo*; Bauh. Hiſt. See Coronilla *juncea*.

Colutea *enneaphyllos ſiliquoſa ind. orient.*; Pluk. Alm. See Indigofera *enneaphylla*.

Colutea *exotica anguſtifolia*; Pluk. Alm. See Coronilla *aculeata*.

Colutea *indica humilis, ex qua indigo*; Burm. Zeyl. See Indigofera *tinctoria*.

Colutea *minima diſpermos*; Pluk. Phyt. See Indigofera *enneaphylla*.

Colutea *ſiliquoſa glabra ternis quiniſve maderaſpatana*; Pluk. Alm. See Indigofera *glabra*.

Colutea *ſiliquoſa ſive ſcorpioides major et minor*; Bauh. Pin. See Coronilla *emerus*.

Colutea *ſcorpioides*; Cam. Epit. See Coronilla *emerus*.

Colutea *ſcorpioides maritima glauca folio*; Bauh. Pin. See Coronilla *glauca*.

Colutea *ſcorpioides minor coronata*; Bauh. Pin. See Coronilla *coronata*.

Colutea *ſcorpioides odorata*; Alp. Exot. See Coronilla *argentea*.

Colutea *ſecunda*; Cluſ. See Coronilla *coronata*.

Colutea *zeylanica argentea tota*; Herm. Lugdb. Rai. Hiſt. See Sophora *tomentoſa*.

COLUTHUS, in *Biography*, a Greek poet, a native of Lycopolis, lived under the emperor Anaſtaſius in the beginning of the ſixth century. His only work that has come down to us is upon the "Rape of Helen," which, though of inferior merit, has been frequently edited, and was tranſlated into French by M. du Molard in 1742. Moreri.

COLVIUS, Andrew, was born at Dort in Holland, in the year 1594, where he officiated during a conſiderable part of his life as paſtor of the Walloon church. In 1620, he was chaplain to the embaſſy at Venice, and cultivated an intimate friendſhip with the celebrated father Paul, whoſe treatiſe on the inquiſition he tranſlated from the Italian into the Latin language. Colvius was intimately acquainted with many literary characters of his own age, and was himſelf a philoſopher and poet of eminence, but he is chiefly known as a collector of rarities of every deſcription, of which, in the year 1655, he publiſhed a catalogue intitled "Catalogus Muſcei And. Colvii." He died at Dort in 1671. Moreri.

COLYBA, or Colybus, a term in the *Greek Liturgy*, ſignifying an offering of corn and boiled pulſe, made in honour of the ſaints, and for the ſake of the dead.

Balſamon, P. Goar, Leo Allatius, and others, have written on the ſubject of *colybæ*: the ſubſtance of what they have ſaid, is as follows:

The Greeks boil a quantity of wheat, and lay it in little heaps on a plate; adding beaten peas, nuts cut ſmall, and grape-ſtones, which they divide into ſeveral compartments, ſeparated from each other by leaves of parſley. A little heap of wheat, thus ſeaſoned, they call κολυβα.

They have a particular formula for the benediction of the colybæ: wherein, praying that the children of Babylon may be fed with pulſe, and that they may be in better condition than other people, they deſire God to bleſs thoſe fruits, and thoſe who eat them, becauſe offered to his glory, to the honour of ſuch a ſaint, and in memory of the faithful deceaſed. Balſamon refers the inſtitution of this ceremony to St. Athanaſius; but the Greek Synaxary to the time of Julian the Apoſtate.

Many of the Latin divines having ſpoken injuriouſly of this ceremony, Gabriel archbiſhop of Philadelphia, has written a diſcourſe in its vindication: wherein he endeavours to ſhew that the deſign of the colyba is only to repreſent the reſurrection of the dead, and to confirm the faithful in the belief thereof. The colybæ, he ſays, are ſymbols of a general reſurrection; and the ſeveral ingredients added to the wheat, ſignify ſo many different virtues.

COLYBRASSENSIS, in *Ancient Geography*, an epiſcopal ſee of Africa, in Pamphylia, according to the acts of the council of Conſtantinople, held in the year 381.

COLYMBIS, in *Ornithology*. Bellonius deſcribes the tufted duck *anas fuligula* of modern writers under the name of *colymbis*.

COLYMBUS, a genus of the *anſeres*, having the bill toothleſs, ſubulate, ſtraight, and pointed; throat denticulated; noſtrils linear, and ſituated at the baſe of the bill; legs fettered.

Linnæus includes in the *colymbus* genus three families of birds; the guillemot, the divers, and the grebes, each of which, in the opinion of moſt ornithologiſts, ought to be conſidered generically diſtinct. The guillemots live chiefly cloſe to the ſea, and inhabit rocks; they have a ſlender tongue the ſize of the bill, and the bill itſelf of a compreſſed form, with the upper mandible a little bent, and the baſe covered with ſhort feathers; they are principally diſtinguiſhed by having the feet three-toed. The divers have a ſtrong bill, leſs pointed, cylindrical, the edges of the mandible turned in, the upper one longeſt; noſtrils divided in the middle by a membrane tongue long, ſharp, ſerrated at the baſe each ſide; legs ſlender; tail-feathers twenty in number; the chief character of theſe conſiſt in the feet being furniſhed with four toes, and palmate; they frequent freſh waters. The grebes are without a tail, have a ſtrong bill; lores naked; tongue a little cleft at the tip; body depreſſed, and thickly covered with ſoft ſhining plumage; wings ſhort, and the legs compreſſed; the principal characteriſtic of this family are the lobate feet; conſiſting of four toes each. Thoſe laſt mentioned birds frequent meres, and other inland watery places.

* *Feet three-toed*, Guillemot.

Marmoratus. Above ſtreaked with cheſnut and brown;

beneath waved with duſky and white; legs tawny; bill, tail, wings, and claws black. *Colymbus marmoratus*, Gmel. *Marbled guillemot*, Lath. Syn. *Uria marmorata*, Lath. Ind. Orn.

Inhabits the weſtern parts of America and Kamtſcatka. This bird is ten inches in length; the crown is duſky; ſome of the greater quill-feathers edged with white; chin duſky, with white ſtripes.

Lacteolus. Snowy; bill and legs browniſh fleſh-colour. *Colymbus lacteolus*, Gmel. *Cepphus lacteolus*, Pallas Spic. *White guillemot*, Lath. Gen. Syn. *Uria lacteola*, Lath. Ind. Orn.

Lives on the ſea-coaſts, and chiefly inhabits the Netherlands. A variety of this bird is deſcribed by writers (Sander Naturſ. &c.) that has a black ſpot on each ſide behind the eyes; interſcapulars and area of the wings black; upper mandible black, the lower yellowiſh.

Grylle. Body deep black; wing-coverts white. *Colymbus grylle*, Linn. Gmel. *Colymbus groenlandicus*. Klein. *Uria minor nigra*, Briſſ. &c. *Greenland dove, ſea turtle*, Albin. *Black guillemot*, Lat. Donov. Brit. Birds, &c.

A general inhabitant of Europe and America, frequenting the ſea-coaſt, and preying on fiſh; it builds its neſt on the ground, the eggs are whitiſh, and ſpotted with black. This ſpecies is liable to ſome variation in the diſpoſition of its ſpots, and appearance of plumage. One variety found at Aoonalaſhka is of a ſooty black colour, with a double white band. Another is ſtreaked above; beneath white, banded with cinereous; upper wing-coverts varied with white and black; this is the *uria balthica* of Brunnich, and inhabits Greenland. A ſecond variety mentioned by the ſame author has the back, wings, and tail black; head, neck, and body beneath, with the ſpot on the wings white. Dr. Latham deſcribes a variety from Kamtſchatka of a black colour, with the crown clouded; the greater wing-coverts, and under ſide of the body, varied with white and black; throat entirely white; and laſtly, the *uria grylloides* of Brunnich is conſidered by ſome as a variety of this ſpecies; the upper part of the plumage of this bird is ſpotted white and black, the colour beneath white.

Troile. Body black; breaſt and abdomen ſnowy; ſecondary wing-feathers white at the tip. *Colymbus troile*, Linn. *Lomwia hoieri*. Ray. *Le guillemot*, Buff. *Lumme*, Marten Spitſ. *Fooliſh guillemot*, Penn. Donov. Brit. Birds, &c.

This bird inhabits Europe and America, and is found in maritime ſituations, as its principal food conſiſts of ſea-fiſh; its uſual reſorts are the ſteepeſt and moſt inacceſſible cliffs on the ſea-coaſt, and in ſuch places is ſeen in vaſt numbers on our own coaſts during the ſummer, in which ſeaſon they breed. The places moſt celebrated as the reſort of thoſe birds are the iſle of Prieſtholm, in Beaumaris bay, between Caernarvonſhire and the iſland of Angleſea; on a rock called Godreve, not far from St. Ives, Cornwall; the Farn iſland, near the coaſt of Northumberland; and the cliffs about Scarborough, Yorkſhire. They are ſilly birds, and ſo ſtupid, that having once attained acceſs to their haunts, they may be knocked down in any numbers with a ſtick, for though they ſee their companions killed before them, they never attempt to quit the rocks. In many parts they are killed by the inhabitants both for the ſake of their fleſh and ſkin; the former is, however, not remarkable for its delicacy, and has a ſtrong fiſhy taſte. The natives of Greenland and Kamtſchatka make garments of their ſkins. Like the auk, this bird lays but a ſingle egg; the eggs are in more eſteem for the table than the fleſh. The length of this bird is ſeventeen inches. There are ſeveral varieties of this ſpecies.

We have followed the example of Linnæus and Gmelin in conſidering the four above-mentioned birds as appertaining to the *colymbus* genus, but it ſhould be at the ſame time obſerved, that Brunnich conſtitutes a diſtinct genus of them under the title of *uria*, and that this genus is adopted by Dr. Latham, in his "Index Ornithologicus," though he adheres to the Linnæan method in his "General Synopſis."

** *Feet four-toed, palmated*, Diver.

Glacialis. Head and neck violaceous black; a white interrupted band on the chin and upper part of the neck. *Colymbus glacialis*, Linn. *Colymbus torquatus*, Brun. *Mergus nævius*, Briſſ. *Colymbus maximus caudatus*, Ray. *L'Imbrina*, Buff. *Greateſt ſpeckled diver* or *loon*, Albin. *Northern diver*, Penn. Donov. Brit. Birds.

This is a large bird, meaſuring about three feet in length; the upper part of the body with the bill, legs, and tail are black; the back and upper part of the wings is marked with a number of white ſpots diſpoſed in rows. Inhabits the Northern ſeas, and is rare in England. The ſpecimen in the London Muſeum.

In Iceland and Greenland, where thoſe birds breed, they are very frequent. It is alſo abundant on the ſhores of Norway, and along the Arctic coaſts as far as the river Obey, in the dominions of Ruſſia. It is ſeldom ſeen on land, except in the breeding ſeaſon, being, for the moſt part, in the open ſea, where it is continually diving for fiſh, which it does with the greateſt addreſs. Among the northern maritime nations, the ſkins of thoſe birds are prepared by the natives, and manufactured with the feathers on them into caps and other articles of dreſs. Garments, we are told, made of theſe ſkins are warm, and never imbibe the leaſt moiſture, and are alſo more durable in wear than might be imagined. The bird is likewiſe met with among the lakes of Hudſon's bay, where the natives adorn their heads with circlets of their feathers.

Immer. Body above blackiſh, undulated with white; beneath entirely white. *Colymbus immer*, Linn. *Mergus major*, Briſſ. *Le grand plongeon*, Buff. *Ember gooſe*, Sibbald. *Imber diver*, Penn. Donov. Brit. Birds.

The length of this bird is two feet; the feathers of the back, wings, and tail are edged with white; in the male bird the front and ſides of the head and neck are ſpotted with brown. This ſpecies inhabits the Arctic ocean; it ranks as a Britiſh ſpecies, but is rarely taken in our country.

Stellatus. Cinereous-brown or duſky, ſpotted with white; throat pale aſh, beneath white. *Colymbus ſtellatus*, Brun. Gmel. *Mergus minor*, Briſſ. *Colymbus caudatus ſtellatus*, Will. *Le petit plongeon*, Buff. *Speckled diver*, or *loon*, Lath.

Obſerved in plenty about the ſhores of the Baltic, and white ſea, and in America. They occaſionally migrate in flocks, purſuing the ſame courſe as the ſhoals of herrings and ſprats, the latter in particular, and it is for this reaſon known in many parts by the name of *ſprat loon*. Theſe birds are more common in the temperate, or ſouthern parts of Europe, than any other of the diver tribe. The length is twenty-ſeven inches, the bill horn colour; legs brown. It builds no neſt, but lays its eggs, which are two in number, in the graſs on the borders of lakes contiguous to the ſea-coaſt; thoſe eggs are duſky, ſpotted with black.

ARCTICUS. Head hoary; neck beneath violaceous, black, with an interrupted white band. *Colymbus arcticus*, Linn. *Mergus gutture nigro*, Briſſ. *Black-throated diver*, Lath.

Length two feet; inhabits the north of Europe, Aſia, and America.

SEPTENTRIONALIS. Body above blackiſh, beneath white; neck beneath with a ſhield-like ſpot. *Colymbus ſeptentrionalis*, Linn. *Mergus gutture rubro*, Briſſ. *Le plongeon à gorge rouge*, Buff. *Red throated diver*, Lath. Donov. Brit. Birds, &c.

Inhabits Europe, Aſia, and America, frequenting lakes, and oftentimes the open ſea in queſt of prey, which conſiſts of fiſh, marine inſects, and crabs. The body is brown above, with minute white ſpots, beneath white; bill black, head and chin cinereous, ſpotted with brown; neck above with ſmall white and brown lines; the legs duſky. Length about thirty inches. Theſe birds lay their eggs in June, the young are hatched and ready to fly before the end of Auguſt, and undertake their annual migrations with the parent birds in September. They breed chiefly in America.

BOREALIS. Body above blackiſh, with numerous white ſtellated ſpots; beneath white; neck on the fore-part rufous. *Colymbus borealis*, Brun.

This bird was ſhot near Copenhagen; it reſembles in ſize and appearance *colymbus ſtellatus*, and is, perhaps, a variety of that bird. Brunnich conſiders it as a diſtinct ſpecies.

STRIATUS. Blackiſh, beneath white; head and neck grey, lineated with black. *Colymbus ſtriatus*, Gmel. *Striped diver*, Lath.

Inhabits North America, where it frequents lakes; it is repreſented as a noiſy clamorous bird, and one continually in motion or on the wing, flying backwards and forwards. The bill of this ſpecies is duſky, or black, and ſtrong; the cheeks white.

SINENSIS. Greeniſh-brown, with deeper ſpots; breaſt and belly reddiſh-white, ſpotted with rufous; wings and tail blackiſh. *Colymbus ſinenſis*, Gmel. *Chineſe diver*, Lath.

This ſpecies inhabits China, and is ſuppoſed to be one of thoſe kinds of aquatic birds which are trained up, and employed by the Chineſe for catching fiſh. The bill is duſky; and the irides and legs cinereous.

*** *Feet four-toed, and lobed.* Grebe.

CRISTATUS. Fuſcous, beneath white; head rufous; collar black; ſecondary quill-feathers white. *Colymbus criſtatus*, Linn. *Colymbus cornutus*, Briſſ. *Le grebe cornu*, Buff. *Creſted grebe*, Lath.

Length of this ſpecies twenty-three inches; bill fleſh-colour, with the tip brown, beneath white; head tumid, varies in colour by age, and has been deſcribed in the firſt, ſecond, and third years' plumage, as three diſtinct ſpecies.

Like the reſt of the grebe tribe, theſe birds form a floating neſt, compoſed of graſs and flags, interwoven with the roots and ſtalks of other aquatic plants. The female lays four eggs, which are of a white colour, and ſits in the neſt half immerſed in water till the eggs are hatched. It preys on eels and fiſh, which it procures with great facility, by diving into the water. The fleſh is rank, but the ſkins, which are prepared with the beautiful ſilken and ſilvery white plumage on them are in high requeſt for muffs and tippets. Many of the grebes are taken on the lakes of Geneva for that purpoſe. In England, thoſe birds frequent the meres of Shropſhire and Cheſhire, and the great fens of Lincolnſhire, in all which places they are known to breed. The tippet grebe is ſaid to be the young of this ſpecies.

CAYANUS. Blackiſh brown, beneath white; under ſide of the neck rufous. *Colymbus cayennenſis*, Gmel. *Le grande grebe*, Buff. *Grebe de Cayenne*, Pl. Enl. *Cayenne grebe*, Lath.

A native of Cayenne. This bird is nineteen inches and a half in length; the bill and legs are duſky; and the lower mandible yellow at the baſe.

AURITUS. Blackiſh-fuſcous, beneath white; neck beneath rufous. *Colymbus auritus*, Linn. *Le petit grebe*, Buff. *Duſky grebe*, Penn. Donov. Brit. Birds.

Inhabits fenny places in Europe and America. Length eleven inches. The bill is black, and red at the ſides; irides and lores purple; upper edge of the wings white; legs fleſh-colour, inclining to purple.

CORNUTUS. Head gloſſy-green, and tumid; neck beneath, and breaſt fulvous; through the eyes a yellow tufted band. *Colybus coruutus*, Gmel. *Horned grebe*, Arct. Zool.

An inhabitant of Hudſon's bay; length twelve inches. Dr. Latham deſcribes the little horned grebe, *le petit grebe cornu* of Buffon as a variety of this ſpecies.

RUBRICOLLIS. Somewhat creſted; chin, cheeks, and regions of the ears aſh-coloured; neck beneath, and breaſt ruſty red; belly and ſecondary quill feathers white. *Colymbus rubricollis*, Gmel. *Colymbus ſubcriſtatus*, Jacq. *Le grebe à joues griſes jougris*, Buff. *Red necked grebe*, Lath. Donov. Brit. Birds.

The length of this bird is eighteen inches; the bill is duſky, and at the ſides at the baſe tawny; the legs duſky. This is a Britiſh ſpecies; the male is very rare, the female ſcarcely known; both ſexes are preſerved in the London Muſeum.

CASPICUS. Head ſmooth; body above dark brown, beneath ſilvery; bill lead colour; chin and cheeks white; wing-coverts brown. S. G. Gmel. Inhabits near the Caſpian ſea.

THOMENSIS. Fuſcous; beneath white, ſpotted with grey; quill-feathers pale rufous; breaſt with a black ſpot. *Colymbus thomenſis*, Gmel. *Le grebe duc-laart*, Buff. *Black-breaſted grebe*, Lath.

Leſs than the common hen; the bill is black, with the tip pale; irides and ſpot between the bill and eyes white; legs duſky. Inhabits St. Thomas's iſland in America.

MINOR. Fulvous brown; beneath, ſpot on the quill-feathers, and lower part of the rump, ſilvery white; neck beneath tawny grey. *Colymbus minor*, Gmel. *Podiceps minor*, Ray. *Little grebe*, Lath. Donov. Brit. Birds.

This bird inhabits Europe and America, is ten inches in length, and feeds on worms, ſmall fiſh, and aquatic inſects. Buffon deſcribes a variety of it under the title of "Le Caſtagneuz des Philippines;" it is larger than the former, the plumage above purple brown; and the cheeks and ſides of the neck reddiſh. Found in the Philippine iſles.

DOMINICUS. Head ſmooth; body beneath thickly ſpotted. *Colymbus dominicus*, Linn. *Le caſtagneux de St. Domingue*, Buff. *White-winged grebe*, Lath.

Inhabits the Antilles and Surinam. Its length is eight inches; the bill is black; body duſky, beneath ſilvery grey; quill-feathers cinereous white; legs brown.

HEBRIDICUS. Head ſmooth; body blackiſh; chin black; throat ſub-ferruginous; belly cinereous, mixed with ſilvery. *Colymbus hebridicus*, Gmel. *Black-chin grebe*, Lath.

A ſmall and rare ſpecies, found chiefly in Tiree, one of the iſlands of the Hebrides.

Podiceps. Body fuſcous; bill olive, duſky at the baſe, with a tranſverſe black band in the middle. *Colymbus podiceps*, Linn. *Le caſtagneux à bec circlé*, Buff. *Pied bill grebe*, Lath.

A native of North America; length fourteen inches; irides white; chin black, ſurrounded with white; body beneath ſilvery; breaſt waved with cinereous; ſecondary quill-feathers black at the tip. The female has no black mark on the bill.

Ludovicianus. Fuſcous; ſides of the neck and body ferruginous; beneath white, with tranſverſe blackiſh ſpots. *Colymbus ludovicianus*, Gmel. *Le grebe de la Louſiane*, Buff. *Louſiane grebe*.

Inhabits Louſiane. The head is ſmooth; legs duſky; middle of the belly ſilvery white.

COLYTON, or Culliton, in *Geography*, is a ſmall but ancient market town in Devonſhire, England. It is called by Riſdon, a "borough of reputation:" the houſekeepers of a ſmall diſtrict, called the borough, annually choſe a portreve at the lord's court. At the Norman conqueſt, Colyton was the king's demeſne; and king John granted the inhabitants a fair, to continue eight days. The houſes are in general built with flints and moſtly thatched. The pariſh church is a ſpacious ſtone fabric, with a tower riſing above the chancel, the upper part of which is octagonal. On the ſouth ſide of the chancel is an incloſed burial-place, belonging to the De la Pole family, containing various effigies, and other monumental decorations: and in a ſmall aiſle adjoining, is the figure of a girl, apparently about five years of age, under a canopy of ſtone; ſhe is ſaid to have been the grand-daughter of Edward IV., and to have been choked by a fiſh-bone; over her are the royal and Courtenay arms. Colyton arms is ſituated 153 miles S.W. from London: the number of houſes is 289; of inhabitants 1641.

COLYTTUS, or Collytus, in *Ancient Geography*, the name of a quarter of the city of Athens, belonging to the Egeide tribe, and adjoining to that called Melitos.

COM, or Kom, in *Geography*, one of the oldeſt, and formerly of the largeſt towns of Perſia in the province of Irak Agemi. It has ſuffered greatly by the civil wars with which the Perſian empire has been ſo often diſtracted, but is ſtill a very populous place; 90 miles S. of Caſbin, and 150 N. of Iſpahan. It is celebrated for its ſilk manufactures, chiefly velvet. N. lat. 34°. E. long. 50°.

COMA. See Como.

Coma, in *Medicine*, a preternatural propenſity to ſleep, though the patient frequently does not ſleep, or if he does, awakes without relief. If ſleep enſues, the diſeaſe is called *coma ſomnolentum*; in this caſe the patient continues in a profound ſleep, and when awaked, immediately relapſes, without being able to keep open his eyes. If he does not ſleep, but is continually awakened with frightful dreams, it is called *coma vigil*: in this caſe he appears to ſleep, having his eyes conſtantly ſhut. Coma is produced by debility, by the want of food, exerciſe, &c. See Apoplexy.

Coma, in *Botany*, from κομη, *a head of hair*, is applied to a leafy crown, whether of the proper leaves of the plant, or of bracteas, riſing above the fructification. In the pine-apple and crown imperial it is of the former kind; in *ſalvia horminum*, or purple topped clary, of the latter, being moreover elegantly coloured with pink or purple. See Comose.

Coma *aurea, africana frutefcens foliis anguſtiſſimis trifidis*, Burm. See Athanasia *erithmifolia*.

Coma *africana frutefcens, foliis inferioribus inciſis*, Comm. See Athanasia *dentata*.

Coma *africana fruticans ericæ folio*, Comm. See Chrysocoma *ciliaris*.

Coma *africana fruticans, foliis erithmi marini*, Comm. See Athanasia *erithmifolia*.

Coma *africana fruticans foliis glaucis & in extremitatibus trifidis*, Comm. See Athanasia *triſurcata*.

Coma *africana fruticans foliis linariæ, major*, Comm. See Chrysocoma *cernua*.

Coma *africana fruticoſa omnium maxima*, Comm. See Athanasia *pubeſcens*.

Coma *foliis multifidis glaucis*, Burm. See Athanasia *parvifolia*.

Coma *Berenices*, *Berenice's Hair*, in *Aſtronomy*, a modern conſtellation of the northern hemiſphere; compoſed of unformed ſtars between the Lion's tail and Bootes.

This conſtellation is ſaid to have been formed by Conon, an aſtronomer, in order to conſole the queen of Ptolemy Euergetes, for the loſs of a lock of her hair, which was ſtolen out of the temple of Venus, where ſhe had dedicated it on account of a victory obtained by her huſband. Ricciol. Alm. lib. vi. cap. 4.

The ſtars in the conſtellation Coma Berenices, in Tycho's Catalogue, are 14; in Hevelius's, 21; and in the Britannic Catalogue, 43.

COMACENUS Lacus, in *Ancient Geography*, the lake of *Como*, which ſee.

COMACHIO, in *Geography*, a ſmall town of Italy, the ſee of a biſhop, in the Ferrareſe, ſurrounded by ſalt marſhes, which render the air inſalubrious, and inhabited chiefly by fiſhermen; 33 miles S.E. of Ferrara. N. lat. 44° 32'. E. long. 12° 6'.

COMACLUM, in *Ancient Geography*, a town of Venetia.

COMAGENA. See Commagene.

COMAGENÆ, a place of Norica, diſtant, according to Antonine's Itinerary, 24 miles from mount Cetius.

COMANA, a town of Pontus, ſeated on the river Iris, towards the mountain of Paryadræ, on the ſouth. It was famous for a temple of Bellona. The town and territory depended on a pontiff, who, on ſolemn days, wore a diadem, and poſſeſſed a kind of ſovereignty. Venus alſo was worſhipped in this city; her feaſt was celebrated with great magnificence, and ſhe had many courtezans.

Comana, a town of Aſia, in the greater Cappadocia, ſeated on the river Sarus, in Cataonia. It was alſo called *Chryſe*, and bore the appellation of Cappadocian.

Comana, or *Bocana*, a town of the iſland of Taprobana, according to Ptolemy.

Comana, or *Commacus*, a town of Aſia, in Piſidia.—Alſo, another town in Phrygia. Ptolemy.

Comana, in *Geography*, a town of South America, in the northern diviſion of Terra Firma. It lies on the north-eaſternmoſt part of the ſea-coaſt.

COMANCHES, or Hietans, a tribe of Indians in Louiſiana in America, who have no fixed place of reſidence, and who have neither towns nor villages. They are divided into ſo many hordes, that they have ſcarcely any knowledge of one another. They never continue in the ſame place for more than a few days, but follow the buffalo, the fleſh of which is their principal food. Some of them purchaſe of the Panis or Towiaches, another tribe, corn, beans, and pumpkins; but their number is ſo great, that theſe articles furniſh a ſmall quantity of their food. Their tents are made of ſkins neatly dreſſed, and faſhioned in the form of a cone, affording room for a family of 10 or 12 perſons; thoſe of the chiefs are capable of accommodating 50 or 60 perſons. When they pitch their tents, they form regular ſtreets and ſquares, exhibiting a ſort of town ſuddenly raiſed, as it were by inchantment, and at a ſignal for march, they are as ſuddenly ſtruck: to every tent are allotted two horſes or mules, one for carrying the tent, and another for removing the poles or ſticks, which are neatly made of red cedar; they all travel on horſeback. Their horſes are tied for grazing with a long halter, and they are ſo numerous as to require frequent change of place. Their horſes are ſo managed, as to be remarkably docile and gentle. It is their practice to hunt the buffalo on horſeback; and they kill this animal with the bow, or a ſharp ſtick like a ſpear, which they carry in their hands. They are generally at war with the Spaniards, committing frequent depredation upon the inhabitants of Santa Fé and St. Antoine; but they have been always friendly and civil to any French or Americans who have been amongſt them. With regard to their perſons, they are ſtrong and athletic, and, in advanced life, corpulent. As ſavages, they are uncommonly clean: the dreſs of their women is a long looſe robe, reaching from the chin to the ground, tied round with a fancy ſaſh or girdle, all neatly made of dreſſed leather, on which they paint figures of different colours and ſignifications: the dreſs of the men conſiſts of cloſe leather pantaloons, and a hunting ſhirt, or frock of the ſame. Their continuance in the ſame place does not admit of their making any plantation; but the ſmall Cayenne pepper grows ſpontaneouſly in the country, and with this, together with ſome wild herbs and fruits, particularly a bean that grows plentifully on a ſmall tree, reſembling a willow, called Maſketo, the women cook their buffalo beef in a manner that renders it grateful food. They alternately occupy the immenſe ſpace of country from the Trinity and Braces, croſſing the Red river, to the heads of Arkanſa and Miſſouri, to river Grand, and beyond it, about Santa Fé, and over the dividing ridge on the waters of the Weſtern Ocean, where, as they ſay, they have ſeen veſſels, which they deſcribe as ſhips, with ſails and rigging. Their native language differs from that of any other nation; but they have a mode of making themſelves underſtood to all the Indians by ſigns. Among them are many Spaniſh men and women, who are ſlaves, and who were made priſoners by them in their youth.

COMANI, in *Ancient Geography*, a people of Aſia, probably of Scythia, who inhabited the country Comania, mentioned by Pliny. They were probably the ſame with the Comi of Ptolemy, and the Comari and Coamani, placed by Pomponius Mela in the vicinity of the Paropaniſians.

COMANIA, a country of Aſia, according to Xenophon. See COMANI.

COMANIA, alſo called *Dagheſtan*, a country in the northern part of Turkey in Aſia, ſouth from Little Tartary, and north from Georgia bounded on the eaſt by the Caſpian ſea, W. by the Caucaſus, N. by Circaſſia, and S. by Skirvan. Its inhabitants are known by the name of Comoucks. See DAGHESTAN.

COMANNA, an inland country of Africa, on the Slave coaſt, bounded on the eaſt by Inſoko, on the ſouth by Lobadde and Ningo, two provinces of Aquamboe; its northern limit is unknown. Little is known of the country, except that its natives bring great quantities of gold to the markets of Akkaradi, a kingdom touching it on the weſt, who afterwards carry it to Aboni, and thence to the negroes of the ſea-coaſt. Beyond Comanna, in regular ſucceſſion from E. to W. but with unaſcertained boundaries to S. and N., are the kingdoms of Latabi, Equea, Bonu, ſituated far north: Taſu, Quako, Aboni, Sankug, Agua, and Achem, all ſuppoſed to be rich in gold; but more eſpecially Quako.

COMARCHIOS, in *Antiquity*, the name of a particular air, or tune, deſigned to be ſung at entertainments.

COMARGO, in *Geography*, a town of North America, in New Leon, ſituate on the ſouth ſide of Rio Bravo, which empties itſelf into the gulf of Mexico on the weſt ſide.

COMARIA PROMONTORIUM, in *Ancient Geography*, a maritime place of India, at the extremity of the peninſula, on this ſide of the Ganges. Ptol. See *Cape* COMORIN.

COMARIS, in *Lithology*, a name given by the Greek writers to the *ſelenites*, or *aphroſelene*.

COMAROIDES, in *Botany*, *alpina argentum*; Segui. See POTENTILLA *nitida*.

COMARTCH, in *Geography*, a river of South Wales, in the county of Brecknock, which runs into the Yrvon, eight miles W. of Builth.

COMARUM, in *Botany*, (Κομαρος,, a name given by Theophraſtus to an evergreen tree, ſuppoſed to be an arbutus.) Linn. Gen. 638. Schreb. 869. Willd. 1004. Gært. 451. Vent. 3. 347. (Pentaphylloides; Tourn.) Claſs and order, *iſocandria polygynia*. Nat. Ord. *Senticoſæ*, Linn. *Roſaceæ*, Juſſ. Vent.

Gen. Ch. *Cal.* Perianth one-leafed, ten cleft, very large, ſpreading, coloured, permanent; alternate ſegments ſmaller, inferior. *Cor.* Petals five, oblong, acuminate, inſerted on the calyx, much ſmaller. *Stam.* Filaments about twenty, awl-ſhaped, inſerted into the calyx, length of the corolla, permanent; anthers creſcent-ſhaped, deciduous. *Piſt.* Germs numerous, roundiſh, very ſmall, collected into a head; ſtyles ſimple, ſhort, from the inſide of the germ; ſtigmas ſimple. *Peric.* none. *Seeds* naked, even-ſurfaced; attached to a large, egg-ſhaped, ſpongy, villous, perſiſting receptacle.

Eſſ. Ch. Calyx ten-cleft, inferior. Petals five, leſs than the calyx. Receptacle egg-ſhaped, ſpongy, villous, perſiſting. Seeds even-ſurfaced.

Sp. C. *paluſtre.* Marſh cinquefoil. Linn. Sp. Pl. Mart. Willd. Flor. Dan. tab. 636. Lam. Ill. tab. 444. Eng. Bot. tab. 172. (Quinquefolium rubrum; Bauh. Pin. 326. Pentaphyllum paluſtre; Cord. Hiſt. 96. 1. Fragaria, Hall. Helv. n. 1128. Potentilla; Scop. Carn. n. 617.) *Root* creeping. *Stems* decumbent at the baſe, cylindrical, leafy, ſmooth. *Leaves* on long petioles, quinate-pinnated; leaflets on ſhort petioles, oblong, ſerrated, hoary underneath; ſtipules embracing the ſtem. *Flowers* dark purple, ſomewhat panicled; peduncles one-flowered, bractes two, lanceolate; ſtamens, anthers, ſtyle, and receptacle, nearly black. A native of England, and moſt other parts of Europe in boggy ground, and by the ſides of ponds. There is a variety with thicker and more villous leaves, but Miller aſſures us that after one year's growth in a garden it is not to be diſtinguiſhed from the common ſort.

COMARUS PORTUS, in *Ancient Geography*, a name given by Dion Caſſius to a port of Epirus, which he places in the gulf of Ambracia. Strabo calls it Comarus Sinus, and makes it a ſmall gulf of Epirus.

COMAYUAGUA, or VALLADOLID, in *Geography*, a large town of the province of Honduras, in Old Mexico, or New Spain, in North America, on a river which falls into the gulf of Honduras. It is the ſee of a biſhop, and has rich ſilver mines in its neighbourhood; 90 miles S.E. of Truxillo. E. long. 88° 4′. N. lat. 14° 30′.

COMB, an inſtrument made of horn, ivory, tortoiſe-ſhell, box, or holly-wood, &c. and uſeful for ſeparating and adjuſting the hair, &c.

Comb *making*. Combs are not only made for the purpoſe of cleaning the hair, but for ornament: they are ſometimes ſet with brilliant ſtones, pearls, and even diamonds; ſome again are ſtudded with cut ſteel; theſe are of different ſhapes, and are uſed to faſten up the hair when ladies dreſs without caps. Combs may of courſe be had of all prices, from the value of a few pence to almoſt any ſum. They are generally made of the horns of bullocks or of elephants, and ſea-horſes teeth, and ſome are made of tortoiſe-ſhell and ivory, others of box or holly-wood. The horns of bullocks are thus prepared for this manufactory: the tips are firſt ſawn off; they are then held in the flame of a wood fire, this is called roaſting, by which they become nearly as ſoft as leather. While in that ſtate they are ſlit open on one ſide, and preſſed in a machine between two iron plates; they are then plunged into a trough of water, from which they come out hard and flat; they are then ſawn into lengths, according to the ſize wanted. To cut the teeth, each piece is fixed into a tool called a claw. The maker ſits on a triangular ſort of a ſtool to his work, and under him is placed the claw that holds the horn, ivory, &c. that is to be formed into a comb. The teeth are cut with a fine ſaw, or rather a pair of ſaws, and they are finiſhed with a file. A coarſer file, called a raſp, is uſed to reduce the horn, &c. to a proper thickneſs; and when they are completely made, they are poliſhed with charcoal and water, and receive their laſt finiſh with powder of rotten ſtone. The proceſs uſed for making ivory combs is nearly the ſame as that already deſcribed, except that the ivory is firſt ſawed into thin ſlices. The beſt ivory comes from the iſland of Ceylon and Achen in the Eaſt Indies, as it poſſeſſes the property of never turning yellow; it is conſequently much dearer than any other kind.

Tortoiſe-ſhell combs are much eſteemed; and there are methods of ſtaining horn, ſo as to imitate it, of which the following is one: the horn to be dyed is firſt to be preſſed into a flat form, and then done over with a paſte, made of two parts of quick-lime and one of litharge, brought into a proper conſiſtence with ſoap-ley. This paſte muſt be put over all the parts of the horn, except ſuch as are proper to be left tranſparent, to give it a nearer reſemblance to tortoiſe-ſhell. The horn muſt remain in this ſtate till the paſte be quite dry, when it is to be bruſhed off. It requires taſte and judgment ſo to diſpoſe the paſte, as to form a variety of tranſparent parts, of different magnitudes and figures, to look like nature. Some parts ſhould alſo be ſemi-tranſparent, which may be effected by mixing whiting with a part of the paſte. By this means ſpots of a reddiſh brown will be produced, ſo as greatly to increaſe the beauty of the work. Horn thus dyed is manufactured into combs, and theſe are frequently ſold for real tortoiſe-ſhell. The wages of journeymen in this buſineſs are from 21*s.* to 31*s.* per week.

In *Plate* XV. of *Mechanics* is repreſented a machine for cutting combs, for which Mr. William Bundy, of Pratt Place Camden Town, took out a patent in the year 1796, and the ſame is deſcribed in the Repertory of Arts. The frame A A. *fig.* 3 of the machine, is like a common lathe, containing a ſpindle, with a crank and fly-wheel, D, upon it, turned by the alternate motion of the treadle, B, which is moved by the workman's foot; E is a wheel fixed on the crank ſpindle, carrying a line in its groove, croſſing between the cheeks of the lathe, and paſſing over the pulley, F, which turns on a centre fixed in the puppet, G; it has two holes in it to receive the horned catch, *a*, *fig.* 2, ſcrewed on the end of an arbor, *b*, about ſeven inches in length, and half an inch in diameter; this arbor is mounted between two circular braſs plates, H, I, *fig.* 1, connected by three pillars, it carries as many circular ſteel cutters, or ſaws, K, *fig.* 4, as the comb to be cut is to have teeth. M, *fig.* 5, repreſents another arbor, which is fixed in the frame-plates, *fig.* 1, by its ends; it is triangular, and has a piece of ſteel, L, *fig.* 4 (called a guide), fitted on it between each ſaw, on the arbor, *b*. Theſe parts are put together by firſt putting the end of the arbor, *b*, *fig.* 2, through the hole in the centre of the frame-plate, I, and ſcrewing on the catch, *a*; the end of the arbor, *fig.* 5, is put into a ſquare hole made in the plate, I, to receive it, and is fixed by a ſcrew; a guide, L, *fig.* 4, is then put on the arbor, M, cloſe againſt the ſhoulder, *d*; next a cutter, K, is put on the arbor, *b*, touching its ſhoulder, *e*; a piece of ſteel plate, N, called a guide-waſher, is then put on the arbor, M, and another guide, L, cloſe to it; the guide-waſher is a little thicker than the cutter oppoſite it, ſo that the cutters each turn between two guides without touching them. Theſe being in their places, a ſmall waſher, O, *fig.* 4, is put on the arbor, *b*, and a cutter, then a guide-waſher and guide, on the arbor, M, and ſo on alternately, till the right number of cutters are put on; the ſliding ſhoulder, *f*, *fig.* 2, is then taken, and with the octagonal nut, *g*, ſcrewed faſt up againſt the laſt cutter, put on the arbor, *b*, this will pinch all the cutters and waſhers between the ſhoulders, *e* and *f*, and hold them faſt. The ſame is done to the arbor of the guides, and, laſtly, the frame-plate, H, is put on the ends of the pillars, and ſcrewed faſt; the whole forming the reſemblage ſhewn in *fig.* 1. The frame-plates with the arbors, as in *fig.* 1, are now to be put in their place in the machine, *fig.* 3, the horns of the catch, *a*, going into two holes in the pulley, F, and the other end of the arbor, *b*, into a centre that goes up with a ſcrew in the puppet, Q; the ſcrews, *h*, *h*, are deſigned to ſteady the frame-plates (which hold the arbor of the guides) againſt the dove-tail, P P, ſupported by brackets projecting from the front of the cheeks, ſufficiently to let the block, *i*, which ſlides in the dove-tail, and holds the comb, be drawn forwards to give room for the hand to put in or take out the combs clear of the cutter. To the baſe of the dove-tail is ſcrewed a plate, holding one of the centres for a worm-wheel, *k*, whoſe axis is made of ſteel, and has its end cut with a deep thread-ſcrew; the ſcrew-end of this axis works in a centre, fixed to the baſe of the dove-tail, and the block, *i*, is cut away to paſs clear over it and the threads of the ſcrews, without touching them. The worm-wheel, *k*, is turned by an endleſs ſcrew, on the arbor of the wheel, *r*, which receives its motion from the pulley, *t*, by an endleſs line. The block, *i*, which holds the comb, moves in the dove-tail, and is to carry the comb towards the cutters while cutting. As the ſcrew on the axis of the wheel, K, is to carry the block up in lieu of a nut; a knife-edge, faſtened to a ſmall lever, *l*, moveable on a centre in the face of the block, is applied to it, and kept down (ſo that the knife-edge may take into the threads of the ſcrew) by a catch ſimilar to the latch of a door, which is releaſed by puſhing in a thumb-ſtud, and allows the ſpring, *o*, to throw up the lever, *l*, and diſengage the ſcrew, ſo that the block may be brought forwards in the dove-tail. The piece of ivory intended to be cut into a comb, is put under a plate, *p*, and held down by two ſcrews to the face of the block, which is in the ſame plane with the arbor of the cutters; the workman then puts down the knife-edge, and the catch keeps it ſo; he then turns the machine by his foot, and puſhes the block towards the cutters (the comb reſting cloſe on the guides) till the knife-edge take the firſt thread of the ſcrew, which turns round as before deſcribed, and puſhes the block and comb up to the cutters, as far as the

the ſcrew extends, and the cutters ſaw the teeth in the comb; the thumb-ſtud is then puſhed in, and the ſpring, *o*, throws the knife-edge up, ſo that the block can be brought back by hand, and the comb taken out. The diſtance which the comb projects from the face of the block towards the cutters, and conſequently the length of the teeth, is regulated by a ſtraight edge of metal on the top of the block, *i*, under the plate, *p*, againſt which the back of the comb reſts; it can be moved parallel to itſelf acroſs the top of the block by two ſcrews, (which are ſeen at the upper corners of the face of the blocks), for combs of longer or ſhorter teeth. The ſpindle of the crank has a wheel, R, on it, turning an arbor, S, by a line, which carries a ſet of cutters for pointing the combs. The arbor is ſhewn ſeparately in *fig.* 6, and a cutter in *fig.* 7; it is made up in the ſame manner as the former one, and faſtened by a ſcrew, T; the ends of the teeth of the comb are applied to this cutter by hand, firſt on one ſide, and then on the other, till the points are made. This is performed to one comb, while the teeth are cutting in another.

Comb, or *Coomb*, in *Huſbandry*, a meaſure of corn, conſiſting of 2 long ſtrikes = 4 Wincheſter buſhels = 16 pecks = 32 dry gallons = 128 dry quarts = 256 dry pints = 8601.6 cubic inches = 4.97 cubic feet = 1.843621 cubic yards = 17.32142 cubic links: in ſome places the buſhel contains eight gallons and a quart.

Comb, *Coomb*, or *Carnook*, of wheat, according to the 9th and 51ſt Henry III. 12th Henry VII., &c., was 256lb. troy = 210.6614lb. avoirdupoiſe = 2 ſtrikes = 16 pecks = 32 gallons = 256 pints or pounds.

Comb, in *Ornithology*, the creſt, or red fleſhy tuft growing on the head of a cock.

Comb, *in a ſhip*, a little piece of timber, ſet under the lower part of the beak-head near the middle: it has two holes in it, and ſupplies to the fore-tacks, what the cheſt-trees do to the main-tacks; that is to bring the main-tacks aboard.

Comb, in the *Manufacture of Tapeſtry*. See Tapestry.

COMB-MARTIN, in *Geography*, a town of England, on the north coaſt of Devonſhire, in the Briſtol channel, with a ſmall creek for boats; near it are ſilver-mines, which formerly yielded a conſiderable quantity of ore; 39 miles W. of Bridgewater, and 176 W. of London.

COMBA, in *Ancient Geography*, a town of Aſia Minor, in the interior of Lycia, and in the vicinity of mount Cragus. Ptolemy.—Alſo, a marſh of Greece, in Macedonia, near mount Athos, mentioned by Athenæus.

COMBAHEE, in *Geography*, a conſiderable river of South Carolina, which enters St. Helena Sound, between Cooſa and Aſhepoo rivers. The ferry of the ſame name on this river is diſtant 17 miles from Jackſon's borough; 15 from Pocotaglio, and 52 from Charleſtown.

COMBAM, or Commum, a town of Hindooſtan, in the country of Cuddapah; 65 miles N. of Cuddapah. Combam is reckoned 25 coſſes from Innaconda, and 32 from Ongole, or about 51 geographical miles from the latter. Tavernier calls it Kaman.

COMBAMET, a town of Hindooſtan, in the country of Golconda; 68 miles E. of Hydrabad.

COMBANA, or Nommana, in *Ancient Geography*, a town of Aſia, in Carmania, ſituated near the ſea.

CAMBARONES, in *Antiquity*, the fellow-barons or commonalty of the Cinque-Ports.

COMBAT, in a general ſenſe, denotes an engagement; or a difference decided by means of arms.

Authors ſometimes diſtinguiſh in an army, between a combat and a battle; the latter expreſſing the general action of the whole army; the former only a particular ſkirmiſh, or engagement of a ſingle part; ſo that the combat is properly a part of a battle.

Combat, in *Law*, or *ſingle combat*, denotes a formal trial, between two champions, of ſome doubtful cauſe or quarrel; by the ſword or batoons.

This form of proceeding was anciently very frequent, particularly among the barbarous nations in their original ſettlements; and obtained, not only in criminal, but alſo in civil cauſes; being built on a preſumption, that God would never grant the victory but to him who had the beſt right. It was originally permitted, in order to determine points reſpecting the reputation of individuals, but afterwards became much more extenſive. See Duel. The form and ceremony of the combat are deſcribed in the grand Coutumier of Normandy. The accuſer, firſt, ſwore to the truth of his accuſation; the accuſed gave him the lie: upon which, each threw down a gage, or pledge of battle; and the parties were committed priſoners to the day of combat. See Champion.

Hiſtorians tell us, that Alphonſus, king of Caſtile, in the eleventh century, deſiring to aboliſh the Moſarabic liturgy, and to introduce the Roman office; the people oppoſing it, it was agreed to terminate the difference by combat, and leave the cauſe to the deciſion of Heaven. One of the earlieſt reſtrictions of this practice that occurs in the hiſtory of Europe, is that of Henry I. of England; which was afterwards followed by an edict of Louis VII. of France to the ſame effect. Robertſon's Hiſt. of Charles V. vol. i. p. 61, &c. and 350, &c. 8vo.

Combat is alſo uſed for the ſolemn games of the ancient Greeks and Romans, performed in honour of their gods; as the Olympic games, Pythian, Iſthmian, and Nemæan games; the ludi Actiaci, Circenſes, &c. which ſee in their places, Olympic, Isthmian, &c.

The combats here celebrated, were *running*, *wreſtling*, *boxing*, *ceſtus*, &c. The combatants, who were called *athletæ*, prepared themſelves for it from their youth, by conſtant exerciſe, and a very rigid regimen: they only eat certain things, and at certain hours; drank no wine; had no commerce with women; and both their labour and their reſt were regulated.

COMBATANT, in *Heraldry*, termed by the French heralds *confronté*, when two animals are borne in coat armour in a fighting poſture, erect on their hind feet, and facing each other.

COMBATTANT, in *Ornithology*, the name given by French writers to the Linnæan *tringa pugnax*, the bird known in this country by the name of *Ruffs* and *Reeves*, the male being called the Ruff, the female Reeve. See Tringa *pugnax*.

COMBEAUFONTAINE, a ſmall town of France, in the department of Upper Saone, chief place of a canton, in the diſtrict of Veſoul. It contains 588 and the canton 7596 inhabitants. The territory includes 190 kiliometres and 17 communes.

COMBEFIS, Francis, in *Biography*, a learned French monk, was born at Guienne, in the year 1605. He purſued his ſtudies firſt under the jeſuits at Bourdeaux and afterwards at Paris. He devoted himſelf principally to the purſuit of Greek literature, and was employed in editing new editions of the Greek fathers, for which he received a very handſome remuneration. He likewiſe publiſhed a collection of the lives of different fathers, popes, and martyrs; ſome additions to the "Bibliotheca Græcorum Patrum," in Greek and Latin, in three volumes folio; "Hiſtoriæ Byzantinæ Scriptores, poſt Theophanem," undertaken by command of the celebrated Colbert. He died in 1679 of the ſtone, a diſeaſe to which ſtudious and ſedentary men are peculiarly liable. Nouv. Dict. Hiſt.

COMBANY, in *Geography*, a river of South Wales, in Carmarthenſhire, which diſcharges itſelf into the Loughor, 5 miles N.E. of Llanalthy.

COMBER, Thomas, in *Biography*, was born at Weſterham in Kent, in the year 1645, where he received the rudiments of a learned education; from thence he was admitted in Sydney college Cambridge. He was remarkable for diligence in his ſtudies, and took his degrees of bachelor of arts in 1662, and of maſter of arts in 1666. Some years afterwards he was created doctor of divinity, probably by a diploma from Lambeth. After this he attained to conſiderable rank in the church, and was preferred to the precentorſhip of York, the deanery of Durham, to be chaplain to their majeſties, and other poſts of emolument and honour. Dr. Comber maintained a correſpondence with Tillotſon, Burnet, and other moſt eminent divines of the age in which he flouriſhed. The excellence of his character, and his zeal for the church of which he was a member, were the cauſes that led him to that diſtinction to which he attained, and which was a ſure earneſt and pledge of ſtill greater preferment if he had lived, but he died in November 1699, in the 55th year of his age, and was buried at Stonegrave in Yorkſhire, of which he was rector. He was author of many learned works relating principally to the Common Prayer, and to the offices of the Church of England.

There was alſo another Dr. Thomas Comber, born in Suſſex, Jan. 1575, who was educated in Trinity college Cambridge, and afterwards made dean of Carliſle. In 1642 he was impriſoned, plundered, and deprived of all his preferments, and died at Cambridge in 1653. He is known as the author of "An Hiſtorical Vindication of the Divine Right of Tythes," 4to. written in anſwer to "Selden's Hiſtory of Tythes." Biog. Brit.

Comber, in *Ichthyology*, a ſpecies of wraſſe or old-wife fiſh, found ſometimes on the coaſt of Cornwall, and which is deſcribed under this name in Ray's Synopſis, No. 163. See Labrus *Comber*.

COMBER-MERE, in *Geography*, a lake of England in the county of Cheſter, on the borders of Shropſhire; five miles S. of Nantwich.

COMBINATION, is properly underſtood of an aſſemblage of ſeveral things by two and two; but is more particularly uſed in *Mathematics*, to denote the variation, or alternation of any number of quantities, letters, ſounds, or the like, in all the different manners poſſible.

P. Merſenne gives us the combination of all the notes and ſounds in muſic, as far as ſixty-four; the ſum whereof amounts to ninety figures, or places.

The number of poſſible combinations of the twenty-four letters of the alphabet, taken firſt two by two, then three by three, &c. according to Mr. Preſtet's calculation, amounts to 1391724288887252999425128493402200.

The words in the following verſe may be combined a thouſand and twenty-two ſeveral ways.

Tot tibi ſunt dotes, virgo, quot ſidera cælo.

F. Truchet, in the Memoirs of the French Academy, ſhews, that two ſquare pieces, each divided diagonally into two colours, may be arranged and combined ſixty-four different ways, ſo as to form ſo many different kinds of chequer-work, which appears ſurpriſing enough, when one conſiders that two letters, or figures, can only be combined twice. This note may be of uſe to maſons, paviours, &c. See Pavement, and Changes.

Combination, *doctrine of.—Any number of quantities being given, together with the number in each* combination; *to find the number of* combinations.

One quantity, we obſerve, admits of no combination; two, *a* and *b*, of one, viz. *ab*; of three, *a*, *b*, *c*, there are three combinations, viz. *ab*, *ac*, *bc*; of four, ſix, *ab*, *ac*, *bc*, *ad*, *bd*, *cd*; of five, ten, *ab*, *ac*, *bc*, *ad*, *bd*, *cd*, *ae*, *be*, *ce*, *cc*, *de*.

Whence it appears, that the number of combinations proceed as, 1, 3, 6, 10, &c. which are triangular numbers, whoſe ſide differs by unity from the number of given quantities, or which are produced by the continual addition of the ordinal ſeries, 0, 1, 2, 3, 4, 5, &c. Hence if the number of things to be combined be q, the ſide of the number of combinations will be $q-1$; and therefore the number of combinations $\frac{q-1}{1}\times\frac{q-0}{2}$. See Triangular *number*.

If three quantities are to be combined, and the number in each combination be three, there will be only one combination, *abc*, if a fourth be added, the combinations will be found *abc*, *abd*, *bcd*, *acd*; if a fifth, ten, *abc*, *abd*, *bcd*, *acd*, *abe*, *bde*, *bce*, *ace*, *ade*, *cde*; if a ſixth, twenty, &c. The numbers of combinations, therefore, proceed, as 1, 4, 10, 20; i. e. they are the firſt pyramidal triangular numbers, whoſe ſides differ by two units from the number of given quantities. See Pyramidal *number*.

Hence, if the number of given quantities be q, the ſide will be $q-2$; and therefore, the number of combinations $\frac{q-2}{1}\times\frac{q-1}{2}\times\frac{q-0}{3}$.

Hence is eaſily deduced a general rule for determining the number of combinations in any caſe; for, ſuppoſe the number of quantities to be combined, q, the exponent of the combination n, the number of combinations will be $\frac{q-n+1}{1}\times\frac{q-n+2}{2}\times\frac{q-n+3}{3}\times\frac{q-n+4}{4}\times\frac{q-n+5}{5}$ &c. till the number to be added be equal to n.

Suppoſe, v. gr. the number of quantities to be combined $=6$; the exponent of the combination 4; the number of combinations will be $\frac{6-4+1}{1}\times\frac{6-4+2}{2}\times\frac{6-4+3}{3}\times\frac{6-4+4}{4}=\frac{6-3}{1}\times\frac{6-2}{2}\times\frac{6-1}{2}\times\frac{6-0}{4}=\frac{3}{1}\times\frac{4}{2}\times\frac{5}{3}\times\frac{6}{4}=15$.

Coroll. If it be deſired to have all the poſſible combinations of the given quantities beginning with the combinations of the ſeveral two's, proceeding to three's, &c. there muſt be added $\frac{q-1}{1}\times\frac{q-0}{2}$, $\frac{q-2}{1}\times\frac{q-1}{2}\times\frac{q-0}{3}$, $\frac{q-3}{4}\times\frac{q-2}{2}\times\frac{q-1}{3}\times\frac{q-0}{4}$, &c.

Whence the number of combinations poſſible will be $\frac{q}{1}\times\frac{q-1}{2}+\frac{q}{1}\times\frac{q-1}{2}\times\frac{q-2}{3}+\frac{q}{1}\times\frac{q-1}{2}\times\frac{q-2}{3}\times\frac{q-3}{4}+\frac{q}{1}\times\frac{q-1}{2}\times\frac{q-2}{3}\times\frac{q-3}{4}\times\frac{q-4}{5}$, &c. which is the ſum of the unciæ of the binomial, raiſed to the power q, and abridged of the exponent of the power increaſed by unity, $q+1$. Wherefore, if $1+1=2$ repreſent the binomial to which theſe unciæ belong, 2^q-q-1 is the number of all the poſſible combinations. V. gr. If the number of quantities be 5, the number of poſſible combinations will be $2^5-6=32-6=26$.

2. *Any number of quantities being given, to find the number of changes and alterations, which thoſe quantities, combined in all the manners poſſible, can undergo.*

Suppoſe two quantities, a and b, their variations will be 2; conſequently, as each of thoſe may be combined, even with itſelf, to theſe there muſt be added two variations. The whole number, therefore, will be $2 + 2 = 4$. If there were three quantities, and the exponent of the variations were 2, the combination will be 3, and the changes 3; to which if the three combinations of each quantity with itſelf aa, bb, cc, be added, we ſhall have the number of changes, $3 + 3 + 3 = 9$.

In like manner it is evident, if the given quantities were 4, and the exponent 2, the number of changes would be 16; if 5, 25, &c. in general, if n, n^2.

Suppoſe the quantities 3, and the exponent of variation 3; the number of changes is found $27 = 3^3$; viz. aaa, aab, aba, baa, abb, aac, aca, caa, abc, bac, bca, acb, cab, cba, acc, cac, cca, bba, bab, bbb, bbc, cbb, bcb, bcc, cbc, ccb, ccc.

After the ſame manner, it will appear, if the quantities were 4, and the exponent 3; the number of changes would be $64 = 4^3$; and, in general, if the number of quantities be $= n$, and the exponent 3, the number of changes will be n^3. By thus proceeding, it will be found that if the number of quantities be n, and the exponent n, the number of changes will be n^n; wherefore, if all the antecedents be added, where the exponent is leſs, the number of poſſible changes will be found $n^n + n^{n-1} + n^{n-3} + n^{n-4} + n^{n-5} + n^{n-6}$, &c. Till at length, the number ſubtracted from n leaves 1; becauſe the beginning is from ſingle quantities taken once.

Since then the number of poſſible changes is in a geometrical progreſſion, whoſe firſt or ſmalleſt term is n^1, the greateſt n^n, and the ratio n; it will be $= \frac{n^{n+1} - n}{n - 1}$. Suppoſe, v. gr. $n = 4$, the number of poſſible changes $\frac{4^5 - 4}{4 - 1} = \frac{1020}{3} = 340$. Suppoſe, again, $n = 24$, the number of poſſible changes will be $\frac{24^{25} - 24}{24 - 1} =$ $32009658644406818986777955348272600 \div 23 =$ $1391724288887252999425128493402200$. In ſo many various manners, therefore, may the twenty-four letters of the alphabet be varied and combined among themſelves.

Combination, in *Chemiſtry*, denotes the union of two bodies of different natures, from which a new compound body reſults. An acid united with an alkali furniſhes an inſtance of combination. See Affinity.

Combinations, in *Law*. Combinations to do unlawful acts, are puniſhable before the unlawful acts are executed; this is to prevent the conſequences of combination and conſpiracies, &c. 9 Rep. 57.

Combination, in *Military Science*. One ought to regard combination as forming a part of military ſcience. A general, who has an enterprize in contemplation, ſhould, before he riſks the execution of it, combine well in his mind all the ideas, that can lead to its ſucceſs; and he ought not always to rely on his own ſolution of the caſe. But when his ideas on the ſubject are pretty well fixed, he ſhould lay them before the general officers, who are under his orders or command, for their opinion and concurrence.

COMBINATORY *diſtillation*. See Distillation.

Combinatory *muſic*, *Muſica combinatoria*, that part of muſic which teaches the manner of combining ſounds variouſly; that is, of changing their place and figure in different manners. See Music.

COMBING *of wool*, in *Commerce*, the drawing of wool acroſs the teeth of a kind of card, calculated to diſpoſe it for ſpinning. See Carding and Scribbling.

COMBLEAN. Cordage, which ſerves for charging and diſcharging the pieces of artillery, for mounting them on their carriages, and for raiſing other great weights by means of a crane

COMBLEMENT des Fossés, the filling of the ditches. When the beſiegers have advanced ſo far as to be maſters of the covert-way, they exert themſelves by every poſſible means to fill up the ditches by eſtabliſhing in them galleries to put their workmen under cover, in order to be able to conduct the miner with ſecurity to his operations, and to retrench themſelves there at the ſame time, to ſecure themſelves againſt the ſallies and inſults of the beſieged.

COMBLES, in *Geography*, a town of France, in the department of the Somme, chief place of a canton, in the diſtrict of Péronne. It contains 1579, and the canton 12,196 inhabitants. The territorial extent is of 155 kilometres, and it includes 23 communes.

COMBOURG, a ſmall town of France, in the department of Ille and Vilaine, chief place of a canton, in the diſtrict of St. Malo, 18 miles S. of St. Malo. The place contains 4170, and the canton 12,151 inhabitants; the territory includes 217½ kiliometres and 10 communes.

COMBRAILLE, formerly a ſubdiviſion of the biſhopric of Limoges, in France, now a department of Creuſe. It was a barony belonging to the ducal houſe of Orleans.

COMBREA, in *Ancient Geography*, a town of Greece, ſituated to the north of Pallene, on the Thermaic gulf. Herodotus calls the country in which it lay *Croſſæa*, between Lipaxos and Liſæ.

COMBRE'E, in *Geography*, a town of France, in the department of the Mayne and Loire, and chief place of a canton in the diſtrict of Segré; 7 miles W. of Segré.

COMBRET, a town of France, in the department of the Aveiron; 8 leagues E. of Alby.

COMBRETUM, in *Botany*, (the name of a plant in Pliny.) Linn. Gen. 475. Schreb. 641. Gært. 212. Juſſ. 320. (Chigomier, Lam. Encyc.) Claſs and order, *octandria monogynia*. Nat. Ord. *Calycanthemæ*, Linn. *Onagræ*, Juſſ.

Gen. Ch. *Cal.* Perianth ſuperior, one-leafed, bell-ſhaped, four or five-toothed, caducous. *Cor.* Petals four or five, egg-ſhaped, about the length of the calyx, and placed between its teeth. *Stam.* Filaments eight or ten, generally very long, inſerted into the calyx; anthers egg-ſhaped or oblong. *Piſt.* Germ inferior, linear; ſtyle briſtle-ſhaped, about the length of the ſtamens; ſtigma acute. *Peric.* none. *Seed* ſingle, with four or five thin membranous wings. (*Capſule* with four or five wings. *Seed* linear, ſmall, with four or five angles, Lam.)

Eſſ. Ch. Calyx four or five-toothed, bell-ſhaped, ſuperior, corolla four or five-petalled, inſerted into the calyx. Stamens generally very long. Seed ſingle, with four or five membranous angles.

Sp. 1. C. *laxum*. Linn. Sp. Pl. 1. Mart. 1. Lam. 1. Willd. 1. Jacq. Amer. 104. Gært. tab. 136? Aubl. Guian. i. 350. tab. 137? Lam. Illuſt. tab. 282. fig. 1? Læfl. It. 308. Swartz. Obſ. 143. (Guara fruticoſa, Læfl. It. 248?) "Flowers octandrous; ſpikes lax, quite ſimple." Lam. "Leaves oppoſite; racemes lax, without bractes; calyxes villous within." Willd. A ſhrub. *Branches* cylindrical, climbing, younger ones brachiate. *Leaves* three inches long or more, petioled, acuminate, ſometimes obtuſe, entire, ſmooth. *Flowers* yellowiſh or whitiſh; in ſimple, axillary, and terminal ſpikes, or rather racemes; ſtamens more than an inch long. A native of Guiana and the Weſt Indies. 2. C. *ſecundum.* Linn. Sp. Pl. 2. Mart. 2. Lam 2. Willd. 2. Jacq. Amer. 103. tab. 176. fig. 30. Swartz. Obſ. 144. "Flowers octandrous; ſpikes compound, panicle-pinnated." Lam. "Leaves oppoſite; racemes unilateral, without bractes; calyces ſmooth." Willd. A ſhrub, or ſmall tree, ten or twelve feet high. *Branches* cylindrical, very long, ſupporting themſelves by the neighbouring trees and ſhrubs. *Leaves* three or four inches long, on ſhort petioles, ovate-oblong, acuminate, entire, ſmooth, veined underneath. *Flowers* very numerous, whitiſh or yellowiſh, in ſeveral ſpikes or racemes, which form a kind of panicle at the ſummit of the branches; anthers red. The flowers, and not the racemes, are often unilateral. Lam. A native of South America, in Guiana, and about the neighbourhood of Carthagena. The ſynonyms of theſe two ſpecies are very confuſed and uncertain. Jacquin ſuppoſes Aublets and Leofling's plants to be the ſame, and to conſtitute a third ſpecies. 3. C. *purpureum.* Mart. 3. Willd. 3. Vahl. Symb. iii. 51. (C. coccineum, Lam 3. Ill. tab. 283. fig. 2. Criſtaria coccinea, Sonnerat. It. ii. 247. tab. 140.) "Flowers decandrous; ſpikes lax, panicled." Lam. "Leaves oppoſite, egg-ſhaped, acute; racemes unilateral, bracteate; bractes ſhorter than the peduncle; flowers decandrous." Willd. A very ſmooth ſurmentous ſhrub, with cylindrical brachiate branches. *Leaves* three inches long, petioled, quite entire, ſomewhat coriaceous. *Flowers* bright red, in terminal panicled racemes; bracte ſolitary, at the baſe of each pedicel briſtle-ſhaped. A native of the iſland of Madagaſcar. 4. C. *decandrum.* Willd. 4. Roxb. Coroman. i. 45. tab. 59. "Leaves oppoſite, oblong, acuminate; racemes lax, bractes longer than the flower; flowers decandrous, in two rows." *Flowers* white, in panicled racemes; bractes lanceolate; ſtamens alternately ſhorter, a little longer than the corolla. A native of woody mountains in the Eaſt Indies. 5. C. *alternifolium.* Willd. 5. Jacq. Amer. 104. Pict. 53. tab. 260. fig. 27. (C. decandrum, Mart. 4.) "Leaves alternate; flowers decandrous." A weak climbing ſhrub, twenty feet high; older branches prickly. *Leaves* two or three inches long, oval-oblong, ending in a blunt, channelled, cartilaginous, quite entire, ſhining, petioled. *Spikes* lax, half a foot long, about ten on one common peduncle, near the end of the little branches, which are often continued weak and leafleſs, ſix feet beyond the flowers. *Flowers* ſmall, uſually coming out before the leaves on very ſhort pedicels. A native of South America, about Carthagena.

COMBRONDES, in *Geography*, a town of France, in the department of Puy de Dôme, chief place of a canton, in the diſtrict of Riom, containing 1568 inhabitants. The territorial extent is of 125 kiliometres, with a population of 7580 individuals diſtributed in 12 communes.

COMBS *of Bees.* See HONEY-*comb.*

COMBURENDO HÆRETICO. See HÆRETICO.

COMBUST, in *Aſtronomy.* When a planet is in conjunction with the ſun, or not diſtant from it above half their diſk; it is ſaid to be combuſt, or in combuſtion.

According to Argol, a planet is combuſt or in combuſtion, when not above eight degrees and thirty minutes diſtant from the ſun, either before or after him.

COMBUSTA, in *Ancient Geography*, a town of Gallia Narbonnenſis, marked in the Itinerary of Antonine, on the route that leads from Narbonne to the paſſage of the Pyrenées.

COMBUSTIO *pecuniæ*, the ancient way of trying mixed and corrupt money, by melting it down, upon payments into the Exchequer. In the time of king Henry II. a conſtitution was made, called the trial by combuſtion; the practice of which differed little or nothing from the preſent method of aſſaying ſilver. But whether this examination of money by combuſtion was to reduce an equation of money only of ſterling, *viz.* a due proportion of alloy with copper, or to reduce it to pure fine ſilver, does not appear. On making the conſtitution of trial it was conſidered that though the money did anſwer *numero et pondere*, it might be deficient in value; becauſe mixed with copper or braſs, &c. Vide Lowndes's Eſſay upon Coin, p. 5.

COMBUSTION, a fire, a burning, denotes the decompoſition of certain ſubſtances, which are thereby called combuſtibles; accompanied with heat and light. The proceſs of combuſtion, the various phenomena it exhibits, its aſtoniſhing effects, its infinite uſes, and its devaſtations, have at all times, rendered it the principal object of human attention in all the various ſtages of life. The whole extent of civil economy, the preparation of food, as well as of almoſt all the articles of neceſſity and of luxury, moſt of the arts of more eſſential uſe to mankind, ſuch as the manufactures of metals, of glaſs, of pharmacy, &c. depend almoſt entirely upon combuſtion. The inclemencies of the weather, and the diſmal darkneſs of night, are removed by means of combuſtion. The moſt active inſtruments of deſtruction depend upon combuſtion. The greateſt ſcenes of wonder, admiration, and terror, like the conflagration of towns, and the eruptions of volcanos, are thoſe in which combuſtion is the ſole actor.

Whilſt the wants and the economy of the multitude, have at all times called forth their induſtry in deviſing eaſy methods of lighting and warming their apartments, of cooking their victuals, &c.; the calm contemplations of philoſophers have endeavoured to inveſtigate the cauſe or cauſes, the commencement, the progreſs, the various intenſity, and the products of combuſtion. It is natural to ſuppoſe that their firſt ideas muſt have been extremely fanciful and incoherent; ſince the preſent theory, which reſts upon the foundation of innumerable experiments and ſtrict reaſoning, is vaſtly different from any ſort of hypotheſis, which even the wiſeſt philoſopher would have been led to form, without the light of thoſe experiments.

The firſt plauſible theory of combuſtion was formed by Stahl, an eminent chemiſt. The ſtriking difference between bodies combuſtible and incombuſtible; that is, between bodies that are, and thoſe that are not ſuſceptible of combuſtion; induced him to ſuppoſe that the combuſtibles were endowed with a peculiar principal of inflammability, which the incombuſtibles had not, and to this ſuppoſed principle he gave the name of *phlogiſton.* According to this ſuppoſition, when combuſtibles were heated to a certain degree, they began to part with this phlogiſton, and continued to burn as long as they had phlogiſton to loſe; after which, they remained in a ſtate of incombuſtibility; hence, in the former ſtate, thoſe bodies were ſaid to be phlogiſticated, and in the latter they were ſaid to be dephlogiſticated. With certain bodies the combuſtion was attended with a ſeparation of other components, ſo that afterwards they could not be brought back to their former ſtate by the mere addition of phlogiſton; but with other bodies, as for inſtance, with the metals, the proceſſes of dephlogiſtication and phlogiſtication might be repeated without end. Thus, a piece of zinc in the metallic ſtate was ſuppoſed to be loaded with phlogiſton, therefore, when expoſed to a ſufficient degree of heat, it would burn, *viz.* it would part with its phlogiſton, and would thereby be reduced into the ſtate of a calx, deſtitute of phlogiſton, and of the metallic appearance; but by placing this calx in contact with bodies which contained abundance of phlogiſton, in a proper ſituation, the calx would thereby be enabled to recover its phlogiſton, and with it its metallic ſtate and combuſtibility. It might then be burnt again, and ſo forth. This plauſible theory was no ſooner made known, than it was eagerly adopted by philoſophers and chemiſts; ſo that for a long period it remained the moſt prevailing theory of combuſtion. But though the theory was univerſally adopted, the exiſtence of the principle upon which it was eſtabliſhed could not be proved. There was no exhibiting the phlogiſtion by itſelf; and it was merely a ſuppoſition that a body acquired or loſt its inflammability, according as it was combined with, or deprived of, its phlogiſton. A ſuppoſition which, on a cloſer examination of facts, was found inadequate to the explanation of the comcomitant phenomena. For inſtance, when a piece of zinc (and ſuch was alſo the caſe with other combuſtibles as far as they might be ſubjected to experiments) of a determinate weight, was burnt and reduced to a calx, the weight of the calx was found to exceed the original weight of the zinc. It was, therefore, evident that it had acquired ſomething ponderable, and this was utterly repugnant to the phlogiſtic theory, for by the loſs of phlogiſton it ought rather to have loſt part of its original weight. In anſwer to this, a ſtrange idea was ſuggeſted, namely, that the phlogiſton was a principle of lightneſs; ſo that bodies became lighter by the addition of phlogiſton and *vice verſâ*. But this ſuppoſition, ſo ſingular and ſo repugnant to the general laws of gravitation, was ſoon abandoned by philoſophers when a variety of deciſive experiments, the concurrence of recent diſcoveries in other branches of philoſophy, and a ſtrict mode of reaſoning, introduced a new theory of combuſtion, which is both ſupported by accurate experiments, and ſufficient to account for the phenomena. One of the principal labours in the experimental inveſtigation, and the full eſtabliſhment of this new and rational theory, was the unfortunate Lavoiſier, to whoſe genius, and to whoſe perſevering induſtry, the ſcientific world muſt ever think itſelf indebted.

In order to render this theory more eaſily underſtood by the reader, we ſhall prefix the following experiment. Take a glaſs veſſel of a cylindrical ſhape, having a ſtopple capable of excluding the entrance or exit of any air, and let the outſide of this veſſel be graduated, ſo as to divide its capacity into pretty ſmall portions. Put into this veſſel, full of common air, a piece of dry phoſphorus of a determinate weight; cloſe the veſſel tight, and heat gradually that part of it in which the piece of phoſphorus ſtands, by means of the flame of a candle. As ſoon as the phoſphorus has been heated to a certain degree, it takes fire of itſelf, burning with a flame and thick white ſmoke; but it ſoon ceaſes to burn. Suffer the veſſel to cool, and the ſmoke will fall in the form of flakes, if the veſſel and the air contained in it were quite dry, otherwiſe theſe flakes will melt in the moiſture. If, in this experiment, the veſſel be weighed before and after the combuſtion, it will be found preciſely of the ſame weight. When the veſſel is cooled to the actual temperature of the atmoſphere, plunge the aperture of it under water, and in that ſituation remove the ſtopple. You will find that the water riſes in it, which ſhews that a portion of the air has been deſtroyed or abſorbed; in ſhort, it has diſppeared. By meaſuring the height of the water riſen within the veſſel, which is indicated by the graduation on the outſide of it; in general, it will be found that about one quarter of the original quantity of air has diſappeared; and the remaining air will be found unfit for the combuſtion of phoſphorus or of any other combuſtible; and is likewiſe unfit for the reſpiration of animals, ſo that if a bird, a mouſe, or any other animal be confined in it, death will ſoon enſue. If the water which has ruſhed into the veſſel be examined, it will be found to have contracted a ſour taſte indicating that an acid has been generated. If the veſſel, inſtead of being opened in water be inverted and opened in quickſilver, then the flakes which in the preceding experiment were diſſolved by the water, will now remain on the ſurface of the quickſilver. This is the acid of phoſphorus, and if it be carefully gathered and weighed, it will be found together with the remaining phoſphorus (if part of it remains unburned), equal to the weight of the original quantity of phoſphorus together with the weight of the air that has diſappeared. Therefore it is evident that the whole proceſs of combuſtion conſiſts in a decompoſition of the pureſt part of reſpirable or atmoſpherical air; the pure part of it, which is about a quarter of the whole, is decompoſed, its baſe is abſorbed by the combuſtible, and generally communicates to it acid properties, in conſequence of which that portion of the atmoſpherical fluid has been called oxygen gas, from the Greek; meaning the acidifying principle. Therefore, in combuſtion, the decompoſition of the oxygen gas is effected by the burning body, when this body has been heated to a certain degree, which degree varies with the nature of the body. The baſe of the oxygen gas is abſorbed and fixed by the burning body, which has thereby its weight increaſed, and its nature changed; whilſt the caloric being diſengaged, paſſes off in the ſtate of ſenſible heat, and ſometimes with ſuch a portion of light as gives the appearance of red or white heat. Acids in general are formed from the abſorption of oxygen during combuſtion. See Oxygen Gas.

When the combuſtion is accompanied with red heat, but not with flame, it is called *ignition*. But ignition may alſo be applied to incombuſtible ſubſtances, for theſe may be rendered red or white hot, without ſuffering any decompoſition. When a vapour ariſing from the heated body burns over it, it is then called *inflammation*; and when the inflammation is rapid and attended with noiſe, it is called *detonation*. Having now compendiouſly ſtated the new theory of combuſtion, it is neceſſary to add ſeveral neceſſary remarks reſpecting every part of it, which could not be intermixed with the theory without rendering it confuſed and leſs intelligible.

In the firſt place, ſince the proceſs of combuſtion conſiſts in a decompoſition of oxygen gas, the generalizing ſpirit of modern philoſophy includes every proceſs, in which oxygen gas is decompoſed, under the general name of combuſtion; thus, animal reſpiration, in which this gas is decompoſed, its baſe abſorbed, and heat evolved; may be reckoned amongſt the proceſſes of ſlow combuſtion. See Respiration. The gradual abſorption of oxygen by metallic bodies may alſo be reckoned amongſt thoſe proceſſes.

Since combuſtion conſiſts in a decompoſition of oxygen gas, it naturally follows that without oxygen no combuſtion can take place. The oxygen, however, may be contained in other ſubſtances, in conſequence of which thoſe ſubſtances become capable of aſſiſting combuſtion. Now there are ſeven of thoſe ſubſtances, which, from their containing oxygen, are called *ſupporters* of combuſtion; and theſe are oxygen gas, atmoſpheric air, nitrous oxyd, nitric oxyd (which is procured by digeſting copper and mercury in diluted nitrous acid, and collecting the gas which is extricated), nitric acid, oxygenized muriatic acid, and hyperoxygenized muriatic acid. See the nature of thoſe ſubſtances under the article Gas. It alſo follows that with a given combuſtible, the quickneſs of the decompoſition is proportionate to the ſupply of oxygen, which ſhews the reaſon why a fire is increaſed by blowing common air, and much more by blowing oxygen gas upon it. But cæteris paribus with different combuſtibles, the fire is ſtrongeſt when the combuſtible has the ſtrongeſt attraction for oxygen. The flame of hydrogen gas urged by oxygen gas is reckoned to produce the moſt intenſe heat.

A combuſtible body, though expoſed to oyxgen, generally requires to be heated to a certain degree before the combuſtion commences. That degree varies with the nature of the body, and the purity of the oxygen; ſo much ſo that ſome of them, though not many, take fire immediately on being expoſed to ſome of the above-mentioned ſupporters of combuſtion in the common temperature of the atmoſphere, whilſt others muſt be heated to a red and even to a white heat, before the decompoſition takes place.

When the combuſtion has once commenced, the heat or caloric, in the form of ſenſible heat, which is extricated from the oxygen gas, raiſes the temperature of the adjacent parts of the combuſtible to that degree which is neceſſary for its combuſtion, and the heat evolved by the burning of this part heats the next and ſo on. But this is not the caſe with all ſorts of combuſtibles; for ſome there are which muſt be kept up at a given high temperature in order to effect their combuſtion, and a diamond is of this ſort. However the nature of combuſtibles in this reſpect varies according to the purity and quantity of oxygen. For inſtance, if a ſlender ſteel wire be expoſed to the flame of a candle in common air, that part of it only will burn, which is acted upon immediately by the flame; but if the ſame wire be lighted by means of a bit of tinder, and then be plunged in a veſſel full of oxygen gas, it will burn ſucceſſively to the very end, like a ſlip of paper; exhibiting a remarkable bright light, and very conſiderable heat.

Of the ſimple bodies of nature, the chemiſts reckon three combuſtible ones, and two that are incombuſtible. The former are ſulphur, phoſphorus, and hydrogen; and the latter are azote and muriatic acid; but amongſt the compound bodies, the combuſtibles are much more numerous. Such are oils, acids, and a vaſt variety of others which being of a fluctuating nature need not be particularly ſpecified.

A variety of experiments, which may be found under the article Gas, prove that gaſſes owe their elaſtic nature to a conſiderable quantity of caloric, which muſt neceſſarily combine with their baſe, in order to aſſume the aerial form. Therefore, when, in conſequence of the ſuperior affinity of the combuſtible for oxygen, the oxygen gas is decompoſed, and its baſe condenſed, the caloric, which was neceſſary to its aerial form, being ſet at liberty, appears in the form of ſenſible heat; hence the heat which accompanies combuſtion is naturally ſuppoſed to proceed from the oxygen gas; and the quantity of it varies according to the rapidity of the proceſs, ſo much ſo that in certain proceſſes like the decompoſition of oxygen effected by metallic ſubſtances in common air, it is not attended with any ſenſible degree of heat; for the heat evolved, being very ſlight, is inſtantly diſſipated among the ſurrounding bodies.

With certain combuſtible bodies a peculiar proceſs takes place. It is a remarkable ſlow proceſs of ſpontaneous combuſtion. The body, by attracting oxygen from the atmoſphere, becomes thereby gently heated, in conſequence of which its affinity to oxygen is increaſed, a greater decompoſition of the latter enſues, more heat is evolved, and thus the proceſs is gradually accelerated until flame and viſible combuſtion take place. Such is ſometimes the caſe with hay, the ſaw-duſt of certain woods, and various other ſubſtances. The well known mixture of iron filings and ſulphur moiſtened with a little water, is an inſtance of this ſort; for if this mixture be buried a little below the ſurface of the ground, it will of itſelf, after the lapſe of ſeveral hours, burſt forth in a ſtate of ignition. This experiment has been generally called the *artificial volcano*.

Though heat in combuſtion is derived from the oxygen gas, the derivation of light is not ſo evident. It has been for a long time ſuppoſed that this element alſo was one of the components of oxygen gas; but the obſervations made reſpecting the light yielded by ſeveral bodies when they are ſlightly heated, or even ſpontaneouſly, and that ſome of them yield much more light than others, ſeem to prove, that light forms a component principle of moſt bodies, and that it is evolved from the combuſtible. It is likely, however, that part of it may be derived from the oxygen alſo.

The following liſt of bodies ſubject to ſpontaneous inflammation is given by profeſſor Bartholdi; meaning the inflammation occaſioned by different bodies acting upon each other, without the aid of another body previouſly in a ſtate of combuſtion.

1. Friction. Thus pieces of wood rubbed againſt each other are thereby inflamed. The beſt for this purpoſe are box-wood rubbed againſt mulberry, or laurel againſt poplar, or againſt ivy, &c. It is in conſequence of friction that the wheels and axletrees of carriages ſometimes take fire, when they are not ſufficiently greaſed. In turning alſo, pieces of wood ſometimes take fire.

2. The action of the ſun's rays concentrated by lenſes, or concave reflectors, or even by plane reflectors, provided their reflections be thrown upon the ſame ſpot. See Burning-*Glaſs*, and Reflectors.

3. The ſudden ſlacking of quicklime has ſometimes been known to produce the combuſtion of adjacent bodies.

4. The fermentation of animal and vegetable ſubſtances. Thus great accumulations of hay, turf, or flax, and hemp, heaps of linen rags in paper mills, &c. take fire, provided they are not quite dry; for without moiſture, fermentation and the conſequent evolution of heat cannot take place.

5. The accumulation of animal and vegetable ſubſtances covered with an oil, eſpecially when the oil is of a drying quality. Thus lamp-black mixed with linſeed oil is apt to take fire, and an earth of a brown colour, called the *black wad of Derbyſhire*, ſprinkled over with a little linſeed oil, takes fire and appears red-hot like burning ſmall coal, in about an hour's time.

6. There are ſeveral ſubſtances, which have the property of inflaming ſpontaneouſly, increaſed by torrefaction. Coffee, French beans, lentils, &c. are of this nature.

7. Sulphurated and phoſphorated hydrogen gas. The cauſe of ſubterraneous fires and volcanoes in general, is attributed to the decompoſition of pyrites, or metallic ſulphurets, buried in the interior of the earth. Theſe pyritous maſſes are decompoſed by the contact and concurrence of water and air, and the decompoſition is always accompanied with a great extrication of caloric, and a diſengagement of a very inflammable gas, called *ſulphurated hydrogen gas*. This gas inflames at an elevated temperature, and communicates the inflammation to the ſulphur of the pyrites, to the coal and other bituminous matters, which generally accompany it.

8. Sulphuret and phoſphuret of lime and of potaſh, formed in the combuſtion of ſeveral vegetables.

9. Phoſphorus ſometimes contained in charcoal.

The laſt particulars which we need take notice of, concerning the theory of combuſtion, are its products. But theſe muſt not be miſtaken for thoſe bodies which exiſted in certain combuſtibles, and have been left by themſelves when the other components of the combuſtible have been ſeparated, ſuch as earthy particles, &c. The real products of combuſtion are thoſe which did not exiſt before, and theſe, upon a ſtrict examination, will be found to be either water, or an oxyde, or an acid. Water conſiſts of oxygen and hydrogen. See Water. An oxyde is a compound of the combuſtible with oxygen, but not ſuch as to poſſeſs decided acid properties, (and the proceſs is called *oxydation*), or an acid, which conſiſts of the acidifiable part of the combuſtible, combined with oxygen ſufficiently to give it decided acid properties. Thus, the combination of carbon and oxygen forms the carbonic acid gas, and this is produced in almoſt every combuſtion, alſo in reſpiration, &c.

COMCHE, in *Geography*, a town of Perſia, where the caravans reſt in their way from Iſpahan to Ormus.

COME, in *Biography*. See Cosme.

Come. The ſmall fibres or tails of malt, upon its firſt ſhooting forth, are thus called.

COME-IN. Soldiers are ſaid to come in as recruits, volunteers, &c. when they come to join any particular corps or ſtandard.

COME-OVER. When men deſert from one army and join another oppoſed to it, they are ſaid to come over to the one, which they join or go over to.

To come *in to*, to join, to bring aid or aſſiſtance.

To come *up with*, to overtake. *To come up with an enemy*, is a military phraſe much made uſe of.

Come *ſopra*, in the *Italian Muſic*, literally ſignifies *as above*, and is uſed when any foregoing part is to be repeated.

COMEA, in *Ancient Geography*, a place of European Myſia, which was an epiſcopal ſee, called by the council of Nice *Comeenſis*.

COMEDÆ, a people of Scythia, compriſed by Ptolemy under the general name of Sacæ.

COMEDONES, a name given to a ſpecies of worm, with which the children of Miſnia, and ſome other countries, are terribly afflicted; and of which Hoffman, in his "Treatiſe of Endemial Diſeaſes," gives this account; children in the country are frequently ſeized with a ſort of tabes, which ſo deſtroys their fleſh, that they appear merely like ſhadows. The common people generally ſuppoſe theſe children to be under the influence of witchcraft; but ſuch as have inquired more narrowly into the diſtemper, have found that it is owing to certain worms, reſembling black hairs or cords, lodged under the ſkin. When the ſkin is rubbed with honey, in a bath, or any warm place, they will appear and come out; but when it is contracted by cold, they keep concealed within. See Affectio *bovina*, and Dracunculi.

COMEDY, in its proper ſenſe, ſignifies an allegorical repreſentation of ſome characteriſtic tranſaction in private life. The drama, under its various forms, has in all ages and countries been cultivated, not only as a rational and polite amuſement, but as a ſerious art, affecting the moral conduct of men, and influencing the condition of ſociety. According to the field it occupies, whether the lighter traits of incidental character, or the important events of life, it aſſumes the form of tragedy or comedy. The firſt commands awe; the laſt excites more pleaſureable and exhilarating ſenſations. The firſt exhibits the fall of a hero; the laſt conducts the fortunes of lovers to the goal of marriage, and ſets down the eccentricities of every character it meets with on the way. If therefore tragedy is more exalted, comedy comes cloſer to the heart, and appeals more powerfully to the experience of man. The ſtronger paſſions, the virtues, the crimes, the ſufferings of mankind are the theme of the one: our humours, our follies, the effervеſcence of youth, or the ſeverity of years the topics of the other. Terror and pity are the inſtruments of pleaſure in the firſt caſe, but ridicule in the laſt.

It is therefore very eaſy to diſcriminate the general ſpirit and ſtrain of comedy from that of tragedy. Neither is it leſs moral or leſs uſeful, when conſidered as a ſatirical exhibition of human life, with all its improprieties and abſurdities. There is nothing in the nature of theſe compoſitions, in either kind, which militates againſt good morals; though a French author endeavoured to affix the imputation of a profane and antichriſtian ſpirit on the great Corneille. The improvement of manners, the regulation of ſocial intercourſe, the ſubjection of vicious conduct to the laſh of infamy, are among the benefits reſulting from this ſpecies of poetry. Ridicule often ſucceeds where argument fails. Yet is it a dangerous weapon, when unſkilfully wielded. For it is by no means the teſt of truth. It may be applied to miſlead and ſeduce, inſtead of reforming; and the blended colours of ridicule are ſometimes more difficult to ſeparate, than the ſtrong lights and ſhades of truth and error. Cicero quotes ſome lines of a comedy, where love is repreſented as the greateſt of the deities. On the ſtrength of this ſentiment, he exclaims loudly againſt comic poetry as a corrector of morals; contending at the ſame time, that the art could not exiſt, if it had not vanity or villainy to feed upon. Beſides this, it happens too frequently, that the ridicule falls where it is leaſt deſerved. This however is the fault of the writer, and not to be imputed to the nature of his ſubject. It depends on the combatant, whether the ſword ſhall be drawn in a good cauſe, or in a bad one. The ſucceſs of tragic repreſentations gave riſe to the ancient comedy at Athens. In the latter, as well as in the former, the unity of action and ſubject is abſolutely requiſite, and thoſe of time and place ſhould be as nearly as poſſible preſerved. By this is meant, that the time of action ſhould be reduced to moderate limits, and the place never changed but with the termination of the act. The ſcenes of converſation muſt be united in a natural ſucceſſion, and the ſtage ſhould be perpetually occupied during the continuance of the act. The audience ſhould likewiſe be made to perceive the neceſſity of the various perſonages appearing and diſappearing juſt as they do. By theſe means, the imitation is allied to probability, and pleaſes in proportion. Probability is indeed more indiſpenſibly neceſſary in comedy, which deſcends to ordinary life, than in tragedy. Nature, whether in the management of the incidents, or the delineation of character and ſentiment, is the only ſolid foundation for this ſpecies of writing. The ſcene and ſubject of comedy ſhould be laid in the country and time, where and when it is to be repreſented. The little proprieties or indecorums of character and behaviour vary with the moment, and become uninteresting or unintelligible, except where they are ſeen and known in real life.

The various perſonages in a well managed comedy ought to be diſtinctly marked, without the affectation of contraſting them by pairs. Ordinary writers may ſeem to acquire a ſtrong light and ſhadow by quaint artifices like theſe: but a maſter looks no further than real life, and repreſents it as it is. The diction ſhould be eaſy, natural, and poliſhed, on a level with the converſation of gentlemen in the higher walks, but above the groſſneſs of the vulgar in the lower. Perhaps there is nothing in the art ſo difficult, as to ſupport a ſpirited and happy dialogue. The parade of miſplaced wit has ſpoiled almoſt as many comedies as actual dulneſs.

The feaſt of Bacchus, Suſarion on his ſtage, and Theſpis in his cart, are the humble origin uſually aſcribed to the drama. Suſarion repreſented his firſt pieces towards the year 580 B. C. Theſpis made his firſt attempts in tragedy, and acted his Alceſtis in 536 B. C. The former attacked the vices and abſurdities of his time; and the latter treated more noble ſubjects, which he took from hiſtory. See DRAMA and THEATRE. Comedy had three ſtages among the Greeks. The ancients indulged in the licence, not only of dramatiſing actual and well-known occurrences, but of identifying them with living perſons. The name even of Socrates was not withheld from theatrical ridicule; and the philoſopher was among the number of the audience. This licence in proceſs of time was interdicted by the authority of the magiſtrates. The players no longer at liberty to ſport with real names, contrived maſks to reſemble the features of thoſe whom they meant to attack: this was the middle comedy. This latter abuſe was ſcarcely leſs offenſive than the former; and was at length prohibited. Deprived of maſks as well as of names, the new comedy confined itſelf within thoſe modeſt and moral bounds, which Menander ſet to its irregularities in the time of Alexander the Great. On this model, Plautus and Terence formed their ſtyle, without taking the trouble of transferring the ſcene to their own country. This ſpecies of entertainment was then ſcarcely naturalized among the Romans; and their performances were rather tranſlations than originals. In the courſe of time, Rome diſtinguiſhed its comedy, founded on native manners, by the name of Comœdia Togata, and that which was borrowed from the Greeks, was diſtinguiſhed as the Comœdia Palliata.

Before the introduction of modern comedy, a ſpecies of dramatic repreſentation was in vogue, taken from the ſtories in the Old and New Teſtament, the Martyrdoms of the Saints, and other religious ſubjects. They were called myſteries: as the myſtery or the Play of the Paſſion, the myſtery of the Acts of the Apoſtles, the myſtery of the Apocalypſe, &c. Theſe entertainments were at firſt given in the churches, and made a part of the eccleſiaſtical ceremonies. Afterwards the myſteries were played on a public ſtage. On the entrance of Charles VII. into Paris in the year 1437, ſcaffolds were erected all along the great ſtreet, St. Deny's, on which were acted, with ſplendid and appropriate decorations, the Annunciation of the Bleſſed Virgin, the Nativity, our Lord's Paſſion, his Reſurrection, the day of Pentecoſt, and the laſt Judgment. In the year 1486, the chapter of the cathedral at Lyons voted ſixty livres to the performers in the myſtery of Jeſus Chriſt's paſſion. About 1540, the ſame city exhibited on Sundays and holidays, for the ſpace of three or four years, the greater part of the hiſtorical facts in the Old and New Teſtament, ſucceeded by a farce, in the ſame manner as in our theatres. The popular name of the play-houſe was Paradiſe. Theſe ſacred comedies were much in faſhion in France under Francis I. who patronized them, and attended their repreſentation. One of thoſe, which attracted his approbation, was entitled the myſtery of the paſſion of our Lord and Saviour Jeſus Chriſt. It is ſaid in the title page to have been performed "triumphantly at Angiers:" and indeed ſo it muſt have been; for there were one hundred and forty-one characters in the dramatis perſonæ. The date of it is 1541. But the abuſes to which theſe religious performances gave riſe occaſioned at length a very ſevere law throughout the kingdom, againſt the exhibition of "Our Lord's Paſſion," and other ſimilar ſubjects. Many of theſe pieces are ſtill extant in print.

One of the firſt objects in modern comedy, is the Spaniſh theatre, fertile as it has been in dramatic productions. Lopez de Vega, Guillin, and Calderon, are the principal comic writers of Spain. The firſt of theſe, and the moſt celebrated, is ſaid to have written above a thouſand plays. [illegible] our ſurpriſe at their number is leſſened when we become acquainted with their nature. Neither the unities, nor any other rules of dramatic writing are in any degree obſerved. One piece often contains the life of a man, nor is the ſcene limited to one quarter of the globe. They are for the moſt part tragi-comedies, taken from Spaniſh hiſtory; where war and heroiſm are coarſely mixed up with ridicule and buffoonery. Allegorical and mythological characters, the Pantheon and the ſacred myſteries, contribute their joint ſtock to theſe extravagant and unique performances. Yet are they not without ſtrong traits of genius, and much ſplendour of imagination. The characters are ſometimes well drawn, and the ſituations happy. To this writer, more than any other, are the public indebted for that taſte for the ſurpriſing, which ſo ſtrongly pervades the modern drama. It is plain from his own apologies, that Lopez de Vega complied with the whimſical fancies of his countrymen; and that had he been at liberty to have led the taſte of his times, inſtead of following it, his ſtories would have been more natural, his intrigues more ſkilfully entangled and unravelled, and his characters more conſiſtently preſerved.

The French comic theatre is in general an excellent ſchool of manners; correct, chaſte, and decent. It may well boaſt of ſuch writers as Regnard, Dufreſny, Dancourt, and Marivaux; but Moliere is the glory of their ſtage. No writer in any department roſe to a higher reputation, in the brilliant age of Louis XIV. It may indeed be queſtioned, whether any comic writer has ever appeared with ſo many excellencies and ſo few defects. Vice and folly are the only objects of his ſatire. Though his characters are often peculiar to his own country and times, the ridicule is applied ſo juſtly as ſcarcely to have loſt its force with foreigners or with poſterity. His mirth is not indulged at the expence of good morals. The "Miſanthrope," and "Tartuffe," are in verſe; they therefore riſe into greater dignity, and aſſume the ſtyle of elegant ſatire. In his proſe comedies he is more ludicrous. His excellence conſiſts more in the ſtrength of his characters, than in the conduct of his plots. He is occaſionally too farcical in his proſe, and too prolix in his verſe. "Tartuffe" in the grave comedy, and his "Avare," in the lighter, are uſually conſidered as his maſter-pieces.

Engliſh comedy abounds more in original characters, than the comedy of any other modern nation. Humour is a leading feature in the character of the people. The freedom of our government and manners affords a wider ſcope to the comic muſe, than ſhe is allowed in the deſpotic courts of the continent. This boldneſs has, however, too often degenerated into a licence almoſt bordering on the immorality of the ancient Greek comedy. But this error has, however, been corrected in later times, and the ſtage has conformed to the more decent manners of an age which is rapidly diſcarding the groſſneſs of vice from public view.

It now only remains to give a character of ſome of our moſt eminent comic writers.

Shakſpeare decidedly takes the lead in each department of the drama; but his excellencies are ſo univerſally felt and underſtood that it would be ſuperfluous to enter into a criticiſm of his productions. Of Jonſon it will only be neceſſary to notice a few leading pieces. "Every Man in his Humour" is a play which places this writer ſcarcely lower than the higheſt, whether we advert to the variety of its characters or the energy of its compoſition. It is to the credit of the preſent taſte, that it regained poſſeſſion of the ſtage, in defiance of its obſolete alluſions, and antiquated garb. "Every Man out of his Humour" has much leſs to recommend it than the preceding comedy, though ſtrongly marked in point of character. It has undergone the uſual fate of perſonal ſatire, to die with the individuals at whom it glances.

"Cynthia's Revels" and the "Poetaſter" are chiefly to be remembered, as having been acted by the children of queen Elizabeth's chapel; a relic of theatrical entertainment after the mode of its ancient inſtitution, when the ſacred myſteries were repreſented by the choir of the church or monaſtery.

Volpone is perhaps the beſt of this author's comedies. The language and character are wrought up to the higheſt finiſh, and the poet exhibits an originality of plot, conception, and execution, which proves that he could throw aſide the trammels of the ſtudent, and lay claim to the honours of an unindebted thinker, as well as thoſe of a ſucceſsful imitator. The pictures of Volpone and Moſca are finely imagined, and their circumſtances moſt happily delineated. His "Epicœne" is exceeded by few comedies in the Engliſh language. If to theſe two we add the "Alchymiſt," the merits of which are univerſally allowed, though the object of its ſatire has given place to other errors and other follies, we ſhall form ſuch a conſtellation of comic genius, as will outſhine all competition but that of his illuſtrious contemporaries. His later pieces, conſiſting of his "Bartholomew Fair," "Staple of News," "New Inn," "Magnetical Lady," and "Tale of a Tub," rather detract from his reputation than augment it; and prove, what many other dramatic writers would have done well to conſider, that faculties devoted to the entertainment of the public will at length be exhauſted, without ſome ſources of repletion from change of ſcene or circumſtances.

The triumvirate, ſuch as was never equalled, before or ſince, in the republic of letters, was completed by John Fletcher, whoſe merits are cloſely blended with thoſe of his aſſociate Beaumont. His genius rather aſſimilates with Shakſpeare than with Jonſon, to whom he is confeſſedly inferior in propriety and preciſion, while he ſurpaſſes him in creative powers and poetical fecundity.

The next writer that obtained a large portion of the public favour and attention was Davenant, whoſe propenſity to poetry is ſaid to have appeared ſufficiently early in life to attract the favourable notice of Shakſpeare, though the great bard died when this young rhymer was only ten years old. What is commonly conſidered as Davenant's firſt play was produced in 1629, though he had attempted dramatic compoſition two or three years before. It is not worth while to enumerate the order or titles of his plays and maſques; which were in general well received, and procured his promotion to the laurel, vacant by the death of Jonſon, as a reward for the aſſiduity with which he directed the diverſions of the court, as long as the troubles of the times permitted it to have any. It was to his addreſs, that the people were indebted for the gradual reſtoration of the muſes, after an interregnum of ſeverity and gloom. At firſt he prevailed on men of taſte and learning to countenance a haſty ſpecies of dramatic melange, which was allowed becauſe it was bad, by the ignorant bigots who held the reins of empire, while rational and regular plays were abſolutely prohibited. But he imperceptibly enlarged his ſphere of compoſition, and after the reſtoration obtained the patent of the theatre in Lincoln's Inn Fields. The ſtage is not perhaps more deeply indebted to any man than to Davenant, for the convenience and aptitude of its arrangements in the manager's department. Beſides many leſs material improvements, it owes to him the introduction of female performers, and painted ſcenery; and from his revival of "Macbeth" and the "Tempeſt" may be dated that devotion to embelliſhment, which has ever ſince inundated the Engliſh ſtage, and, in the judgment of ſeverer critics, overwhelmed the ſenſe and diſcernment of the audience. His irregular entertainments, reſorted to in the firſt inſtance only as ſubſtitutes for better things, may indeed be conſidered as the root of all that theatrical evil, we ſo gravely condemn, but at the ſame time ſo freely encourage. Yet he had the praiſe of bringing forward to the public eye ſcenery, women, and Betterton.

Maſſinger was alſo among the ſterling ſupports of the Engliſh drama; of which he may juſtly be reputed one of the fathers. His ſtyle was rough, manly, and vigorous; he preſſed upon his ſubject with a ſevere but maſterly hand; his wit was cauſtic, and his ſerious dialogue, according to its ſubject, ſtern and impreſſive, or natural, eaſy, and intereſting.

Dryden did not commence his career as a writer for the theatre, till the thirty-ſecond year of his age; but from that period he kept poſſeſſion of it, and produced eight and twenty dramas, not indeed without competition or cenſure, but with a large ſhare of predominant reputation. His firſt production was the "Wild Gallant;" a comedy, which met with ſo indifferent a reception, that had Dryden been a man of fortune, the ſtage had never again been benefited by his aſſiſtance. He was aſſociated with Davenant, in the alteration of the "Tempeſt;" but he acknowledges the invention and writing of the new characters chiefly to belong to his colleague. We cannot, however, help contemplating the perfections of Shakſpeare with aſtoniſhment, when we find that two ſuch powerful minds could produce little or no addition to the effect.

On the character of his comedies, it will not be difficult to decide. He has, himſelf, acknowledged his inaptitude to that ſpecies of compoſition; and certainly his plays in general have much leſs merit than his other writings. Yet, after all, he has eſtabliſhed a reputation that will never fade, even in this branch of poetry; and his drama of the "Spaniſh Friar" may be ſelected, as an inſtance of happy coincidence and real ingenuity, in the combination of ſerious and riſible materials. Indeed the unfitneſs of his comic performances for modern repreſentation ariſes more from their extreme licentiouſneſs and immorality than from any defect of power.

The comedies of Otway are deſervedly excluded from the reading deſk as well as from the ſtage, on account of their undiſguiſed obſcenity.

Congreve, at the age of twenty-one, produced the "Old Bachelor," at the theatre in Drury Lane, to amuſe himſelf in a ſlow recovery from a fit of ſickneſs. It received ſome requiſite touches from the maturer judgment of his friends, and Dryden declared that he had never ſeen ſuch a firſt play. The "Double Dealer," and "Love for Love" ſucceeded it, at an interval of a year each. Five years afterwards his comedy, called the "Way of the World," cloſed his dramatic labours at a time of life, when writers in general are but beginning their career. The indifferent ſucceſs of his maſterpiece excited his diſguſt at the caprices of the public. He never reſumed his pen in the ſervice of the theatre, except to write a maſque, called the "Judgment of Paris," and an opera, called "Semele," which was never repreſented; but as his fame reſts on his five regular pieces, we may conſider him as loſt to the ſtage, after the unkind reception of a play, which has ſince vindicated its ſtation among the moſt brilliant ornaments of the drama.

It is on his comedies principally, that Congreve's reputation ſubſiſts. Here, all is luminous, all genuine, pointed, and original. His men of faſhion are gentlemen, and even his fops are wits. Congreve is conſidered as having leſs humour and leſs of real life, than his illuſtrious rivals of the ſock. But, ſurely "Foreſight" abounds with the richeſt humour, and that of a deſcription, which, though now antiquated, was living and current at the time. Indeed it is an undoubted teſtimony to the happy drawing of this character, that though it is only recognized by the modern ſpectator as a picture of the days that are gone by, it never fails to excite riſibility on the ſtage in a very powerful degree. The leading feature of Congreve's genius is wit. Dr. Johnſon ſays, that he formed a peculiar idea of comic excellence, which he ſuppoſed to conſiſt in gay remarks and unexpected anſwers. Now, certainly, in adopting ſuch a theory of compoſition, he too much narrowed his own ſphere. Still, however, no more is to be required of a writer, than what he himſelf undertakes; and Congreve performed what he undertook with a brilliancy of ſucceſs, which, with the exception of Mr. Sheridan, has neither been rivalled nor approached in the revolution of the century that has elapſed. It has been objected, that "his perſonages are a kind of intellectual gladiators; every ſentence is to ward or ſtrike; the conteſt of ſmartneſs is never intermitted." This remark is undoubtedly true; yet, when we find Congreve thus formidably cenſured for the exuberance of his wit, it is impoſſible not to feel as the king of Pruſſia did, when he wiſhed a certain mad commander to bite ſome of his generals.

Could the licentiouſneſs of Congreve's topics be as eaſily juſtified as the overflowings of his gaiety, his fame would continue to blaze without danger of eclipſe. But in truth, the offence his muſe occaſions to the purer ears of a more moral age, has an unhappy tendency to ſhorten his theatrical exiſtence. The obſervation applies equally, if not in a greater degree, to all his witty, but graceleſs contemporaries; and it may be remarked on ſuch freedoms in general, that they create diſguſt and alienation, at leaſt in ſome minds, in a place and on an occaſion, where it ſhould be as much an author's ſtudy never to offend any, as occaſionally to pleaſe all; conſequently though they may increaſe the number of temporary plaudits, they infect the vitals of a reputation, that otherwiſe might have been immortal, with a principle of early decay.

To particularize the merits either of Congreve's rivals, Wycherly, Farquhar, Vanburgh, &c. or the numerous claſs of writers in the ſucceeding ages, who have cultivated the *comedie larmoyante*, would exceed the limits of this article. The latter is indeed almoſt as obſolete as the coarſe but ſterling wit of king Charles's days. It has given place to the diſtorted portraits and philoſophy-run mad of the German ſchool; a taſte from which it is moſt devoutly to be wiſhed that the drama may be ſpeedily reſcued.

COMENII, in *Ancient Geography*, a people of Illyria, according to Ptolemy, adjoining to the Daurſiani and Vardæani.

COMENITZA, in *Geography*, a town of European Turkey, in the province of Epire, 52 miles S.W. of Delfino.

COMENIUS, John Amos, in *Biography*, a celebrated grammarian and divine, was born in the year 1592, in Moravia. He ſtudied at Herborn, and returned to his own country in 1614, and was appointed rector of a college there. In 1618 he became paſtor of the church at Fulnec, and was appointed maſter of the ſchool which had been lately erected. Here he conceived the idea of an improved method of teaching the languages, but his writings on this ſubject were deſtroyed in 1621, when the town was taken and plundered by the Spaniards. In 1624 he retired from the perſecutions inflicted upon the Proteſtants in Germany, to Leſna, a city of Poland, where he devoted himſelf to the inſtruction of young perſons in the Latin language: here he publiſhed in 1631 his "Janua Linguarum reſerata," a work which obtained for him great reputation, and which was ſpeedily tranſlated into 12 European languages, and alſo into the Arabic, Turkiſh, Perſian and Mogul languages. He was now invited into Sweden to take the charge of the public ſchools in that kingdom, which he declined; and having publiſhed the "Panſophiæ Prodromus," or "Forerunner of Univerſal Science," he was ſolicited by the parliament of England to undertake the reformation of the ſchools there. He arrived in London Sept. 1641, but owing to the civil wars his propoſals were neglected, and he went to Sweden, and from thence to Elbing in Pruſſia, where he employed ſix years in perfecting his new method of inſtruction, but did not meet with ſufficient encouragement to induce him to publiſh his thoughts on the ſubject. In 1648 Comenius was invited to the court of Sigiſmund Ragotſki, prince of Tranſylvania, where he lived four years, and propoſed regulations for the college of Patak, upon the plan of his Panſophia, from whence he returned to Leſna, and continued there till 1656, when the town was burnt in the war between the Swedes and the Poles. On this occaſion he loſt all his manuſcripts excepting what he had compoſed on his Panſophia, and the Apocalypſe. He fled into Sileſia, thence to Brandenburgh, afterwards to Hamburgh, and laſtly to Amſterdam, where he continued till his death, which happened in 1671. At Amſterdam he publiſhed his "New Method of Teaching," which added nothing to his reputation, and which the learned Bayle has declared of no worth whatever in the art of inſtruction. In this opinion he is ſanctioned by the concurrent voice of the learned in every ſucceeding age to the preſent time.

Comenius was not only intent upon the reformation of ſcholaſtic learning, but he embraced the notions of a ſpeedily approaching millennium, and pointed out as characters who were to be eminently diſtinguiſhed in fulfilling the prophecies, Guſtavus Adolphus, Cromwell, and others, who had little claim to the honours of a divine miſſion. Succeeding events contributed to diſſipate, in ſome meaſure, the enthuſiaſtic notions which he had embraced and cheriſhed. By ſome of his contemporaries he was charged with having poſſeſſed more knavery than credulity, but of this there ſeems to be no ſatisfactory evidence. He publiſhed "Commentaries on the Apocalypſe," ſome treatiſes on the Socinian controverſy, and "Hiſtoria Fratrum Bohemorum," in 4to. Nouv. Hiſt. Dict. Bayle.

COMENOLITARI, in *Geography*, a country of modern Greece, which compriſes the ancient kingdom of Macedonia and Theſſalia.

COMENSES, in *Ancient Geography*, a people of Aſia Minor, towards Galatia, according to Pliny. Hardouin calls them Chomenſes, deriving their name from Choma, a town ſituated in the interior of Lycia.

COMERCHIN, in *Geography*, a town of European Turkey, in the province of Romania; 62 miles E. of Emboli.

COMES *Nervi Phrenici*, in *Anatomy*, is a ſmall branch of the internal mammary artery. See Arteries.

Comes, in *Antiquity*. See Count.

Comes, Natalis, in *Biography*, was born at Milan in the ſixteenth century, and is greatly diſtinguiſhed for his claſſical learning. He tranſlated from Greek into Latin the "Deipnoſophiſtæ of Athenæus," the "Rhetoric of Hermogenes," and he publiſhed poems of his own in both theſe languages. In 1581 he publiſhed a hiſtory of his own times from 1545 to 1572, but his principal work is a ſyſtem of mythology entitled, "Mythologiæ, ſive Explicationis Fabularum, lib. x." It was dedicated to Charles IX. of France. He died in 1589, and on account of his love of allegory and myſticiſm he was denominated by Joſeph Scaliger "Homo futiliſſimus." Moreri.

Comes *Domeſticorum Equitum et Peditum*: Colonels of the archers of the body-guard of the Roman emperors. Thoſe archers were all of them choſen men of Armenia; and their number amounted to ſeven thouſand five hundred.

COMESSAZZA, in *Geography*, a river of Italy, which runs into the Oglio; 9 miles N.E. of Sabionetta.

COMESSAZZO, a town of Italy, in the duchy of Mantua, $3\frac{1}{2}$ miles N. of Sabionetta.

COMESUS, a lake of America, in the ſtate of New York; 27 miles S. of the lake of Ontario.

COMET, in *Aſtronomy*, a heavenly body, in the planetary region, appearing ſuddenly, and again diſappearing: and during the time of its appearance moving in a proper, though very eccentric orbit, like a planet. Comets, like the planets, move in different planes, but the motion of ſome of them is direct, and that of others retrograde.

Comets, popularly called *blazing ſtars*, have this to diſtinguiſh them from the other ſtars, that they are uſually attended with a long train of light, always oppoſite to the ſun, and which is of a fainter luſtre, the farther it is from the body. Hence ariſes a popular diviſion of comets into three kinds, viz. *bearded*, *tailed*, and *hairy comets*; though in effect this diviſion rather relates to the ſeveral circumſtances of the ſame comet, than to the phenomena of ſeveral.

Thus, when the comet is eaſtward of the ſun, and moves from it, it is ſaid to be *bearded*, becauſe the light precedes it in manner of a beard. When the comet is weſtward of the ſun, and ſets after it, it is ſaid to be *tailed*, becauſe the train follows it in manner of a tail. Laſtly, when the comet and the ſun are diametrically oppoſite, (the earth being between them), the train is hid behind the body of the comet, excepting a little that appears around it in form of a border of hair, or *coma*, whence it is called *hairy*, and whence the name of comet is derived.

Comets, *nature of*.—As to the nature of comets, the infrequency of their appearance, together with the ſeeming irregularities of their phenomena, have left philoſophers of ancient, and even more modern times, much in the dark. Thoſe who lived before Ariſtotle, accounted for them by ſuppoſing the heavenly ſpaces full of an infinite number of ſtars; and many of them too remote, or too ſmall, to have ever come under the notice of aſtronomers; theſe inviſible ſtars they farther ſuppoſed to move by their own proper motion every way; finiſhing their courſes in very unequal times. Now, a comet, according to them, was a vaſt heap or aſſemblage of theſe little ſtars, meeting together, by reaſon of the inequality of their motions, and uniting into a viſible maſs; which muſt again diſappear, as thoſe ſtars ſeparated, and each proceeding in its courſe. But how thoſe ſtars ſhould thus meet, coaleſce, and form a body, which in all poſitions of the ſun ſhould reſemble a tail, and again ſeparate, is a myſtery.

This opinion, therefore, Ariſtotle eaſily overturned: ſubſtituting another in its ſtead. According to Ariſtotle, comets were only a kind of tranſient fires or meteors, conſiſting of exhalations raiſed to the upper region of the air, and there ſet on fire; far below the moon's courſe. But neither is this hypotheſis more juſt than the other: for on this principle, the light of the comet, being independent of the ſun, would be diſperſed every way alike, without any appearance of a train, or tail, which is contrary to the phenomena. Moreover, they are obſerved at the ſame time in places on the earth very remote from each other. Beſides, the modern aſtronomers who have meaſured the diſtance between the comets and the earth, find that the comets have no ſenſible diurnal parallax; which could not be, were they not much more remote than the moon, whoſe parallax is ſenſible: and yet as they have a ſenſible annual parrallax, they are not ſo remote as the fixed ſtars. Indeed, there were ſome, Pliny tells us, among the ancients, who, "had juſter notions; who took theſe ſtars to be perpetual, and believed they moved in their proper orbs; but were never ſeen, unleſs when left by the ſun." Ariſtotle, in his firſt book of Meteors, mentions this doctrine of the ancient philoſophers; and obſerves, that ſome of the Italians, called Pythagoreans, ſaid, that a comet is one of the planets, but that they do not appear unleſs after a long time, and are ſeen but for a ſhort time, which happens alſo to Mercury. Apollonius Myndius declared, that he took comets for regular ſtars; affirming alſo, that the comets were reckoned by the Chaldæans among the planets, and to have their periods like them. He alſo ventured to foretel, that one day the periods and laws of their motion would be diſcovered. And more fully Seneca, Quæſt. Nat. lib. vii. He had himſelf ſeen at leaſt two comets, one in the reign of Claudius, the other in that of Nero; beſides that which he ſaw in his youth, a little before the death of Auguſtus, which in one place he calls a comet, and in another a prodigy. He intimates that he thought them above the moon, and argues ſtrongly againſt thoſe who imagined that they were meteors elevated into the air by winds, or who held ſome other abſurd opinions concerning them. "I am not of the common opinion," ſays he, "nor do I take a comet to be a ſudden fire, but eſteem it among the eternal works of nature." *Quid autem miramur cometas, tam rarum mundi ſpectaculum, nondum teneri legibus certis, nec initia illorum fineſque innoteſcere, quorum ex ingentibus nec intervallis recurſus eſt? Veniet tempus quo iſta quæ nunc latent, in lucem dies extrahat, & longioris ævi diligentia. Veniet tempus quo poſteri noſtri tam aperta nos neſciſſe mirentur. Erit qui demonſtret aliquando, in quibus cometæ partibus errent; cur tam ſe ducti a cæteris errent, quanti qualeſque ſint.*

This prediction we have ſeen accompliſhed in our days by the great ſir Iſaac Newton; whoſe doctrine concerning them will appear in the ſequel of this article. Seneca recommended it to aſtronomers to keep a catalogue of the comets, in order to be able to determine whether they returned at certain periods. The authority of Ariſtotle, however, long prevailed; and comets were generally conſidered as meteors, exiſting in our atmoſphere, till the time of Tycho Brahe. This excellent aſtronomer was the firſt among the moderns, who, after diligently obſerving the comet of 1577, and finding that it had no ſenſible diurnal parallax, aſſigned it its true place in the planetary regions. (See his book De Cometa, anni 1577.)

Although few comets have approached ſo near the earth as to have a diurnal parallax, they afford ſufficient indications of an annual parallax; that is, the revolution of the earth in her orbit cauſes their apparent motion to be very different from what it would be, if they were viewed from the ſun, or any fixed place. See the firſt of the phenomena recited in the ſequel. This ſhews that they are not ſo diſtant as the fixed ſtars, which have no annual parallax; and, as Hevelius obſerves, affords a proof of the earth's revolution round the ſun; for, without ſuppoſing that, theſe motions of comets are inexplicable. Tycho was preceded by Kepler, who, in his book "De Cometis," concluded from obſervations of the comets which appeared in 1607 and 1618, that comets move freely through the planetary orbs, with a motion not much different from a rectilineal one; but of what kind he could not preciſely determine. He was followed by Hevelius, an accurate obſerver of the heavenly bodies, who found, by his own obſervations of two comets that appeared in his time, that they were not ſubject to diurnal parallax; that calculations of their places, made upon a ſuppoſition that they moved in ſtraight lines, did not agree with their true places; but that their orbits were concave towards the ſun; and concluded, that they moved in parabolic trajectories.

Hevelius, from a great number of obſervations, propoſes it as his opinion, that the comets, like the ſolar maculæ or ſpots, are formed and condenſed out of the groſſer exhalations of his body: or that they are generally in the atmoſphere of a planet, and diſcharged from it, partly by the rotation of the planet, and then revolved about the ſun in a parabola by the force of projection and its tendency towards the ſun, in the ſame manner as a projectile upon the earth's ſurface deſcribes a parabola. In which notion he agrees nearly with Kepler, who maintains, that comets are generated in the æther in vaſt numbers, like fiſhes in the ocean; though they do not all become viſible; either becauſe of their ſmallneſs, or becauſe they lie a long time under the horizon.

But ſir Iſaac Newton has ſhewn the fallacy of this hypotheſis, by proving that the comet of 1680, in its paſſage through the neighbourhood of the ſun, would have been diſſipated, had it conſiſted of exhalations of the ſun and planets: for the heat of the ſun, it is allowed, is as the denſity of his rays, i. e. reciprocally as the ſquares of the diſtances of places from the ſun. Wherefore, ſince the diſtance of that comet in its perihelion, December the 8th, was obſerved to be to the diſtance of the earth from the ſun, nearly as 6 to 1000; the ſun's heat in the comet at that time, was to his heat with us at midſummer, as 1000000 to 36, or 28000 to 1.

And again, finding by experiment, that the heat of boiling water is little more than three times the heat of our dry earth, when expoſed to the midſummer's ſun; and aſſuming the heat of red-hot iron to be about three or four times as great as that of boiling water; he thence concludes, that the heat of the dried earth, or body of the comet in its perihelion, muſt be near 2000 times as great as that of red-hot iron.

Such an immenſe heat once acquired in its perihelion, the comet muſt be a long time in cooling again. The ſame author computes, that a globe of red-hot iron, of the dimenſions of our earth, would ſcarce be cool in 50000 years. If then the comet be ſuppoſed to cool 100 times as faſt as red-hot iron; yet ſince its heat was 2000 times greater, ſuppoſing it of the bigneſs of the earth, it would not be cool in a million of years.

James Bernouilli, in his "Syſtema Cometarum," ſuppoſes ſome primary planet revolving round the ſun in the ſpace of four years and one hundred and fifty-ſeven days; and at the diſtance, from his body, of 2583 ſemidiameters of the magnus orbis; this planet, he concludes, either from its vaſt diſtance, or ſmallneſs, to be inviſible to us: but, however, to have, at various diſtances from him, ſeveral ſatellites moving round him, and ſometimes deſcending as low as the orbit of Saturn; and that theſe becoming viſible to us, when in their perigæum, are what we call comets.

Des Cartes advances another opinion: he conjectures that comets are only ſtars, formerly fixed like the reſt, in the heavens; but which becoming by degrees covered with maculæ, or ſpots, and at length wholly robbed of their light, cannot keep their place, but are carried off by the vortices of the circumjacent ſtars; and, in proportion to their magnitude and ſolidity, moved in ſuch manner as to be brought nearer the orb of Saturn; and thus coming within reach of the ſun's light, rendered viſible.

But the vanity of all theſe hypotheſes abundantly appears from the phenomena of comets; the chief of which we ſhall enumerate; as being the teſt by which all theories are to be tried.

Firſt, then, thoſe comets which move according to the order of the ſigns, do all, a little before they diſappear, either advance ſlower than uſual, or elſe go retrograde, if the earth be between them and the ſun; and more ſwiftly, if the earth be ſituate in a contrary part. On the other hand, thoſe which proceed contrary to the order of the ſigns, proceed more ſwiftly than uſual, if the earth be between them and the ſun; and more ſlowly, or go retrograde, when the earth is in a contrary part.

2. So long as their velocity is increaſed, they move, nearly, in great circles; but towards the end of their courſe, they deviate from thoſe circles; and as often as the earth proceeds one way, they go the contrary way.

3. They move in ellipſes, having one of their foci in the centre of the ſun; and by radii drawn to the ſun, deſcribe areas proportionable to the times.

4. The light of their bodies, or nuclei, increaſes in their receſs from the earth toward the ſun; and on the contrary, decreaſes in their receſs from the ſun.

5. Their tails appear the largeſt and brighteſt, immediately after their tranſit through the region of the ſun, or after their perihelion.

6. The tails always decline from a juſt oppoſition to the ſun towards thoſe parts which the bodies, or nuclei, paſs over, in their progreſs through their orbits.

7. This declination, *cæteris paribus*, is the ſmalleſt, when the heads, or nuclei, approach neareſt the ſun: and is leſs, ſtill, nearer the nucleus of the comet, than towards the extremity of the tail.

8. The tails are ſomewhat brighter, and more diſtinctly defined in their convex than in their concave part.

9. The tails always appear broader at their upper extreme than near the centre of the comet.

10. The tails are always tranſparent, and the ſmalleſt ſtars appear through them.

Theſe are the chief phenomena of comets; which it is evident, cannot eaſily be reconciled with the wild notions of the ancients, and the weak conjectures of many of the moderns.

"The comets," ſays ſir Iſaac Newton, "are compact, ſolid, fixed, and durable bodies: in one word, a kind of planets; which move in very oblique orbits, every way with the greateſt freedom; perſevering in their motions, even againſt the courſe and direction of the planets; and their tail is a very thin ſlender vapour, emitted by the head or nucleus of the comet, ignited or heated by the ſun."

This at once ſolves all the foregoing phenomena: for, 1. "It is evident, that thoſe which proceed according to the order of the ſigns, a little before they diſappear, muſt move more ſlowly, or appear retrograde, if the earth be betwixt them and the ſun; and ſwifter if the earth be in a contrary part. On the contrary, thoſe proceeding againſt the order of the ſigns," &c. For ſince this courſe is not among the fixed ſtars, but among the planets; as the motion of the earth either conſpires with them, or goes againſt them; their appearance, with regard to the earth, muſt be changed; and, like the planets, they muſt ſometimes appear ſwifter, ſometimes ſlower, and ſometimes retrograde.

2. "When the comets move the ſwifteſt, they muſt proceed in ſtraight lines; but in the end of their courſe, decline," &c. Becauſe, in the end of their courſe, when they recede almoſt directly from the ſun, that part of the apparent motion which ariſes from the parallax, muſt bear a greater proportion to the whole apparent motion.

3. "The comets muſt move in ellipſes, having one of their foci in the centre of the ſun." Becauſe they do not wander precariouſly from one fictitious vortex to another; but, making a part of a ſolar ſyſtem, return perpetually, and run a conſtant round.

Hence, their elliptic orbits being very long and eccentric they become inviſible, when in that part moſt remote from the ſun.

From conſidering the curvity of the paths of comets, ſir Iſaac concludes, that when they diſappear, they are much beyond the orb of Jupiter; and that in their perihelion they frequently deſcend below the orbit of Mars, and the inferior planets.

4. "The light of their nuclei muſt increaſe in their receſs from the ſun, and *vice verſâ.*" Becauſe as they are in the regions of the planets, their acceſs toward the ſun bears a conſiderable proportion to their whole diſtance.

From obſervations of the comet of 1680, ſir Iſaac Newton found, that the vapour in the extremity of the tail, January 25th, began to aſcend from the head before December 11th; and had therefore ſpent more than forty-five days in its aſcent; but that all the tail which appeared December 10th, aſcended in the ſpace of thoſe two days, then juſt paſt ſince its perihelion. The vapour, therefore, at the beginning, when the comet was near the ſun, aſcended with a prodigious ſwiftneſs; and afterwards continued to aſcend with a motion retarded by the gravity of its particles; and by that aſcent increaſed the length of the tail; but the tail, notwithſtanding its length, conſiſted almoſt wholly of vapours, which had aſcended from the time of its perihelion; and the vapour which aſcended firſt, and compoſed the extreme of the tail, did not vaniſh till it was too far from the ſun to be illuminated by him, and from us to be viſible. Hence alſo, the tails of comets that are ſhorter, do not aſcend with a quick and continual motion from the head, and then preſently diſappear; but are permanent columns of vapours and exhalations, gathered from the head, by a very gentle motion, and a great ſpace of time; which yet, by participating of that motion of their heads they had at the beginning, continue eaſily to move along with their heads through the celeſtial regions: whence alſo the vacuity of thoſe regions is argued. See VACUUM.

5. "Their tails muſt appear the largeſt and brighteſt immediately after their tranſit through the region of the ſun." Becauſe, then, their heads being the moſt heated, will emit the moſt vapours.

From the light of the nucleus, or apparent ſtar, we infer their vicinity to the earth, and that they are by no means in the region of the fixed ſtars, as ſome have imagined; ſince, in that caſe, their heads would be no more illuminated by the ſun, than the planets are by the fixed ſtars.

6. "The tails muſt ſtill decline from a diſtinct oppoſition to the ſun, towards the parts which the heads paſs over, in their progreſs through their orbits." Becauſe all ſmoke, or vapour, emitted from a body in motion, tends upwards obliquely, ſtill receding from that part, towards which the ſmoking body proceeds.

7. "That declination will be ſtill the leaſt near the nucleus of the comet; and when the comet is neareſt the ſun." Becauſe the vapour aſcends more ſwiftly near the head of the comet, than in the higher extremity of its tail; and when the comet is at a leſs diſtance from the ſun than when at a greater.

8. "The tail is brighter, and better defined in its convex part than in its concave." Becauſe the vapour in the convex part, which goes firſt, being ſomewhat nearer and denſer, reflects the light more copiouſly.

9. "The tail muſt appear broader towards the higher extremity of the comet than towards the head." Becauſe the vapour in a free ſpace is perpetually rarefied and dilated.

10. "The tails muſt be tranſparent." Becauſe conſiſting of infinitely thin vapour, &c.

Thus accurately does the hypotheſis tally to the phenomena.

COMETS, *phaſes of*.—The nuclei, which we alſo occaſionally call the *heads* and *bodies* of comets, viewed through a teleſcope, ſhew a very different face from thoſe of the fixed ſtars, or planets. They are liable to apparent changes, which ſir Iſaac Newton aſcribes to changes in the atmoſphere of comets; and this opinion was confirmed by obſervations of the comet in 1744. Hiſt. Acad. Scienc. 1744. Sturmius tells us, that, obſerving the comet of 1680, with a teleſcope, it appeared like a coal dimly glowing, or a rude maſs of matter illumined with a duſky fumid light, leſs ſenſible at the extremes than in the middle; rather than as a ſtar, which appears with a round diſk, and a vivid light.

Hevelius obſerved of the comet of 1661, that its body was of a yellowiſh colour, very bright, and conſpicuous, but without any glittering light: in the middle was a denſe ruddy nucleus, almoſt equal to Jupiter, encompaſſed with a much fainter, thinner matter. February 5th, its head was ſomewhat bigger and brighter, of a gold colour; but its light more duſky than the reſt of the ſtars: here, the nucleus appeared divided into ſeveral parts. February 6th, the diſk was leſſened; the nuclei ſtill exiſted, though leſs than before: one of them, on the lower part of the diſk, on the left, much denſer and brighter than the reſt, its body round, and repreſenting a very lucid little ſtar: the nuclei ſtill encompaſſed with another kind of matter. February 10th, the head ſomewhat more obſcure, and the nuclei more confuſed, but brighter at top than bottom. February 13, the head diminiſhed much, both in magnitude and brightneſs. March 2d, its roundneſs a little impaired, its edges lacerated, &c. March 28th, very pale and exceeding thin; its matter much diſperſed; and no diſtinct nucleus at all appearing.

Weigelius, who ſaw the comet of 1664, the moon and a little cloud illumined by the ſun at the ſame time, obſerved, that the moon, through a teleſcope, appeared of a continued luminous ſurface; but the comet very different; being perfectly like a little cloud in the horizon illumined by the ſun. From theſe obſervations it was, that Hevelius concluded comets to be like maculæ, or ſpots formed out of the ſolar exhalations.

Comets, *magnitude of.* The eſtimates that have been given by Tycho, Hevelius, and ſome others, of the magnitude of comets, are not ſufficiently accurate to be depended upon; for it does not appear, that they diſtinguiſhed between the nucleus and the ſurrounding atmoſphere. Thus Tycho computes that the true diameter of the comet in 1577, was in proportion to the diameter of the earth as 3 is to 14. Hevelius made the diameter of the nucleus of the comet of 1661 and alſo that of 1665 at the commencement of their appearances to be leſs than a 10th part of the diameter of the earth, and from the parallax and apparent magnitude of the head of the comet of 1652 on the 10th of December, he computed its diameter to be to that of the earth, as 52 to 100. By the ſame method he found the true diameter of the head of the comet of 1664 to be at one time 12 ſemi-diameters of the earth, at another time not much above 5 ſemi-diameters. The diameter of the atmoſphere is often ten or fifteen times as great as that of the nucleus; the former, in the comet of 1682, was meaſured by Flamſteed, and found to be 2′, but the diameter of the nucleus only 11 or 12″. Some comets, from the apparent magnitude and diſtance compared, have been judged to be much larger than the moon, and even equal to ſome of the primary planets. The diameter of that of 1744, when at the diſtance of the ſun from us, meaſured about 1′, and therefore its diameter muſt be about three times the diameter of the earth: at another time the diameter of its nucleus was nearly equal to that of Jupiter.

Hence it has been conjectured that ſome of the ſolar eclipſes, recorded in hiſtory, that cannot be verified by calculation from tables of the ſun and moon, have been occaſioned by the interpoſition of comets between the ſun and the earth. The eclipſes of the ſun mentioned by Herodotus (l. vii. c. 37, and l. ix. c. 10.) have been thus accounted for, and alſo the eclipſe that happened a few days before the death of Auguſtus, mentioned by Dion: and it is obſervable, that Seneca ſaw a comet the ſame year. Hiſtory records ſome comets that have appeared as large as the ſun, (vid. Seneca, N. Q. l. 7. c. 15); and, therefore, if ſuch a comet near its perigee were to come between the ſun and our earth, it would eclipſe him for a time. Some have thought that the darkneſs which occurred at our Lord's crucifixion might have been occaſioned by a comet then paſſing between the earth and the ſun. (Hevel. Cometogr. p. 540. Freret, reflexions ſur un ancien phenomene celeſte au temps d'Ogyges, Mem. de Literature, vol. xix. p. 357).

Dr. Herſchel obſerved ſeveral comets which ſeemed to him to have no nucleus. The ſix comets diſcovered by his ſiſter were of this kind, and appeared to be mere collections of vapours condenſed about a centre. Five more were obſerved by himſelf, which were nearly of the ſame nature. This circumſtance, he ſays, "throws a myſtery over their deſtination, which ſeems to place them in the allegorical view of tools, probably deſigned for ſome ſalutary purpoſes to be wrought by them; and, whether the reſtoration of what is loſt to the ſun by the emiſſion of light may not be one of theſe purpoſes, I ſhall not preſume to determine. The motion of the comet diſcovered by M. Meſſier, June, 1770, plainly indicated how much its orbit was liable to be changed by the perturbation of the planets, from which, and the little agreement that can be found between the elements of the orbits of all the comets that have been obſerved, it appears clearly that they may be directed to carry their ſalutary influence to any part of the heavens."

Comets, *Formation of the tails of.* Sir Iſaac Newton ſhews, that the atmoſphere of comets will furniſh vapour ſufficient to form their tails: this he argues from that wonderful rarefaction obſerved in our air, at a diſtance from the earth: a cubic inch of common air, at the diſtance of half the earth's diameter, or four thouſand miles, would neceſſarily expand itſelf ſo far as to fill a ſpace larger than the whole region of the planets. Since then the coma or atmoſphere of a comet, is ten times higher than the ſurface of the nucleus, counting from the centre thereof; the tail, aſcending much higher, muſt neceſſarily be immenſely rare: ſo that it is no wonder the ſtars ſhould be viſible through it.

Now, the aſcent of vapours into the tail of the comet, he ſuppoſes occaſioned by the rarefaction of the matter of the atmoſphere at the time of the perihelion. Smoke, it is obſerved, aſcends the chimney by the impulſe of the air wherein it floats; and air, rarefied by heat, aſcends by diminution of its ſpecific gravity, taking up the ſmoke along with it: why then ſhould not the tail of a comet be ſuppoſed to be raiſed after the ſame manner by the ſun? for the ſun beams do not act on the mediums they paſs through any otherwiſe than by reflexion and rarefaction.

The reflecting particles, then, being warmed by the action, will again warm the æther wherewith they are compounded; and this, rarefied by the heat, will have its ſpecific gravity, whereby it before tended to deſcend, diminiſhed by the rarefaction, ſo as to aſcend, and carry along with it thoſe reflecting particles, whereof the tail of the comet is compoſed.

This aſcent of the vapours will be promoted by their circular motion round the ſun; by means whereof, they will endeavour to recede from the ſun, while the ſun's atmoſphere, and the other matters in the celeſtial ſpaces, are either at reſt, or nearly ſo; having no motion but what they receive from the ſun's circumrotation.

Thus are the vapours raiſed into the tails of comets in the neighbourhood of the ſun, where the orbits are moſt curve; and where the comets, being within the denſer atmoſphere of the ſun, have their tails of the greateſt length.

The tails thus produced, by preſerving that motion, and at the ſame time gravitating towards the ſun, will move round his body in ellipſes, in like manner as their heads; and, by this means, will ever accompany, and freely adhere to their heads. In effect, the gravitation of the vapours towards the ſun will no more occaſion the tails of the comets to forſake their heads, and fall down towards the ſun, than the gravitation of their heads will occaſion them to fall off from their tails: but by their common gravitation, they will either fall down together to the ſun, or be together ſuſpended, or retarded. This gravitation, therefore, does not at all hinder, but that the heads and tails of comets may receive and retain any poſition towards each other, which either the above mentioned cauſes, or any other, may occaſion. The tails, therefore, thus produced in the perihelion of comets, will go off along with their heads into remote regions; and either return thence, together with the comets, after a long ſeries of years; or rather, be there loſt, and vaniſh by little and little, and the comets be left bare; till at their return, deſcending towards the ſun, ſome little ſhort tails are gradually and ſlowly produced from the heads; which afterwards, in the perihelion, deſcending down into the ſun's atmoſphere, will be immenſely increaſed.

The vapours, when they are thus dilated, rarefied and diffuſed through all the celeſtial regions, the ſame author obſerves, may probably, by little and little, by means of their own gravity, be attracted down to the planets, and become intermingled with their atmoſpheres.

He adds, that for the conſervation of the water, and moiſture of the planets, comets ſeem abſolutely requiſite; from whoſe condenſed vapours and exhalations, all that moiſture which is ſpent in vegetations and putrefactions, and turned into dry earth, &c. may be reſupplied and recruited. For all vegetables grow and increaſe wholly from fluids; and, again, as to their greateſt part, turn, by putrefaction, into earth again; and earthly ſlime being perpetually precipitated to the bottom of putrefying liquors. Hence, the quantity of dry earth muſt continually increaſe, and the moiſture of the globe decreaſe, and at laſt be quite evaporated, if it has not a continual ſupply from ſome part or other of the univerſe. And I ſuſpect, adds our great author, that the ſpirit, which makes the fineſt, ſubtileſt, and the beſt part of our air, and which is abſolutely requiſite for the life and being of all things, comes principally from the comets. So far are they from portending any hurt or miſchief to us which the natural fears of men are apt to ſuggeſt from the appearance of any thing that is uncommon and aſtoniſhing.

On this principle, there ſeems to be ſome foundation for the popular opinion of preſages from comets; ſince the tail of a comet thus intermingled with our atmoſphere, may produce changes very ſenſible in animal and vegetable bodies.

But the tranſmutation of water into earth is now juſtly exploded: Woodward, Boerhaave, and others, having obſerved that water is only an agent in conveying the nutritious matter to vegetable bodies, and not that matter itſelf.

Another uſe which ſir Iſaac Newton conjectures comets may be deſigned to ſerve, is that of recruiting the ſun with freſh fuel, and repairing the conſumption of his light by the ſtreams continually ſent forth in every direction from that luminary. In ſupport of this conjecture he obſerves, that comets in their perihelion may ſuffer a diminution of their projectile force, by the reſiſtance of the ſolar atmoſphere; ſo that by degrees their gravitation towards the ſun may be ſo far increaſed, as to precipitate their fall into his body. Thus alſo, fixed ſtars which have been gradually waſted, may be ſupplied with freſh fuel, acquire new ſplendour, and be taken for new ſtars: of this kind are thoſe fixed ſtars, which appear on a ſudden, or ſhine with a ſurpriſing brightneſs at firſt, and afterwards vaniſh by degrees.

There have been various conjectures about the generation of the tails of comets. Apian, Cardan, Tycho Brahe, and ſome others, apprehended that they were produced by the ſun's rays tranſmitted through the nucleus of the comet, which they ſuppoſed to be tranſparent, and there refracted as in a lens of glaſs, ſo as to form a beam of light behind the comet. But this cannot be the caſe, becauſe the figure of a comet's tail does not correſpond to ſuch a refraction, and alſo becauſe ſuch refracted light would not be ſeen by an eye placed ſideways to it, unleſs it fell upon ſome reflecting ſubſtance denſer than the circumambient æther. Kepler ſuppoſed, that the rays of the ſun carry away ſome of the groſs parts of the comet which reflect the ſun's rays, and give the appearance of a tail. Hevelius thought, that the thinneſt parts of the atmoſphere of a comet are rarefied by the force of the heat, and driven from the fore-part and each ſide of the comet towards the parts turned from the ſun. Des Cartes accounted for the phenomenon of the tail by the refraction of light from the head of the comet to the eye of the ſpectator. If this were the caſe, the planets and principal fixed ſtars muſt have tails alſo; for their rays paſs through the ſame medium before they reach our eyes, as light from the comets does. Mairan ſuppoſes that the tails are formed out of the luminous matter that compoſes the ſun's atmoſphere, which is ſuppoſed to extend as far as the orbit of the earth, and to furniſh matter for thoſe northern lights called the *Aurora Borealis*, which ſee. M. De la Lande combines this hypotheſis with that of Newton above recited. He thinks that part of the vapour which forms them ariſes out of the atmoſphere rarefied by heat, and is puſhed forward by the force of the light ſtreaming from the ſun; and alſo that a comet paſſing through the ſun's atmoſphere is drenched therein, and carries away ſome of it. Mr. Rowning, who is not ſatisfied with ſir Iſaac's opinion, accounts for the tails of comets in the following manner. It is well known, ſays he, that when the light of the ſun paſſes through the atmoſphere of any body, as the earth, that which paſſes on one ſide, is by the refraction thereof made to converge toward that which paſſes on the oppoſite one; and the convergency is not wholly effected either at the entrance of the light into the atmoſphere, or at its going out; but beginning at its entrance, it increaſes in every point of its progreſs. It is alſo agreed that the atmoſpheres of the comets are very large and denſe. He therefore ſuppoſes that by ſuch time as the light of the ſun has paſſed through a conſiderable part of the atmoſphere of a comet, the rays thereof are ſo far refracted toward each other, that they then begin ſenſibly to illuminate it, or rather the vapours floating therein; and ſo render that part they have yet to paſs through viſible to us: and that this portion of the atmoſphere of a comet, thus illuminated, appears to us in form of a beam of the ſun's light, and paſſes under the denomination of a comet's tail. Rowning's Natural Philoſophy, part iv. chap. 11.

We have an inquiry into the cauſe of the tails of comets, by Mr. Euler, in the Mem. de l'Acad. de Berlin, tom. ii. p. 117, ſeq. He thinks there is a great affinity between theſe tails, the zodiacal light, and the Aurora borealis; and that the common cauſe of them all, is the action of the ſun's light on the atmoſphere of the comets, of the ſun, and of the earth. He ſuppoſes that the impulſe of the rays of light on the atmoſphere of comets, may drive ſome of the finer particles of that atmoſphere far beyond its limits; and that this force of impulſe combined with that of gravity towards the comet, would produce a tail, which would always be in oppoſition to the ſun, if the comet did not move. But the motion of the comet in its orbit, and about an axis, muſt vary the poſition and figure of the tail, giving it a curvature, and deviation from a line drawn from the centre of the ſun to that of the comet; and that this deviation will be greater, as the orbit of the comet has the greater curvature, and that the motion of the comet is more rapid. It may even happen, that the velocity of the comet, in its perihelion, may be ſo great, that the force of the ſun's rays may produce a new tail, before the old one can follow; in which caſe the comet might have two or more tails. The poſſibility of this is confirmed by the comet of 1744, which was obſerved to have ſeveral tails while it was in its perihelion. See AURORA *borealis*, and ZODIACAL *light*.

Dr. Hamilton urges ſeveral objections againſt the Newtonian hypotheſis; obſerving, that we have no proof of the exiſtence of a ſolar atmoſphere; and if we had, that when the comet is moving in its perihelion, in a direction at right angles to the direction of its tail, the vapours which then ariſe partaking of the great velocity of the comet, and being alſo ſpecifically lighter than the medium in which they move, muſt ſuffer a much greater reſiſtance than the denſe body of the comet does, and therefore ought to be left behind, and would not appear oppoſite to the ſun; and afterwards they ought to appear towards the ſun. Beſides, if the ſplendour of the tails be owing to the reflexion and refraction of the ſun's rays, it ought to diminiſh the luſtre of the ſtars ſeen through it; which would have their light reflected and refracted in like manner; and conſequently their brightneſs would be diminiſhed. He concludes that the tail of a comet is formed of matter which has not the power of refracting or reflecting the rays of light; but that it is a lucid or ſelf-ſhining ſubſtance; and from its ſimilarity to the *Aurora borealis*, produced by the ſame cauſe, and a proper electrical phenomenon. Dr. Hamilton ſupports his opinion by the following arguments. A ſpectator, at a diſtance from the earth, would ſee the Aurora borealis in the form of a tail oppoſite to the ſun, as the tail of a comet lies. The Aurora borealis has no effect upon the ſtars ſeen through it, nor has the tail of a comet. The atmoſphere is known to abound with electric matter, and the appearance of the electric matter in vacuo reſembles exactly that of the Aurora borealis, which, from its great altitude, may be conſidered to be in as perfect a vacuum as we can make. The electric matter in vacuo ſuffers the rays of light to paſs through, without being affected by them. The tail of a comet does not expand itſelf ſideways, nor does the electric matter. Hence, he ſuppoſes the tails of comets, the Aurora borealis, and the electric fluid to be the ſame kind of matter. As a further confirmation of this opinion it may be added, that the comet in 1607 appeared to ſhoot out the end of its tail. Le P. Cyſat remarked the undulations of the tail of the comet in 1618. Hevelius obſerved the ſame in the tails of the comets in 1652 and 1661. M. Pingrè noticed the ſame appearance in the comet of 1769: and theſe are circumſtances ſimilar to the Aurora borealis. Dr. Hamilton conjectures, that the uſe of the comets may be to bring the electric matter, which continually eſcapes from the planets, back into the planetary regions. Theſe arguments very much corroborate this hypotheſis; and if it be true, we may further add, that the tails are hollow; for if the electric fluid only proceed in its firſt direction and do not diverge ſideways, the parts directly behind the comet will not be filled with it; and this thinneſs of the tails will account for the appearance of the ſtars through them. Dr. Halley ſeemed inclined to this hypotheſis, when he ſaid, that the ſtreams of light in an Aurora borealis ſo much reſembled the long tails of comets, that at firſt ſight they might well be taken for ſuch: and that this light ſeems to have a great affinity to that which the effluvia of electric bodies emit in the dark. Phil. Tranſ. N° 347. Hamilton's Philoſophical Eſſays, p. 91, &c.

Hevelius particularly informs us, that he obſerved the comet of 1665 to caſt a ſhadow upon the tail, for in the middle of its length there appeared a dark line. Caſſini alſo obſerved in the tail of the comet of 1680 a darkneſs in the middle of the tail; and the ſame appearance was taken notice of by a curious obſerver in the tail of the comet of 1744. The lengths of the tails of comets are various, and depend on a variety of circumſtances. Longomontanus mentions a comet that in 1618, December the 10th, had a tail which appeared under an angle of 104°: that of 1680 appeared under an angle of 70°, according to ſir I. Newton, and very brilliant: the comet of 1744 had a tail, which at one time appeared to extend 16° from its body; and which, allowing the ſun's parallax to be 10″, muſt have been above 23 millions of miles in length. The diameter of its nucleus was nearly equal to that of Jupiter. The tail of the comet of 1759 appeared, according to M. Pingré, under an angle of 90°; but the light was very faint. The length of a comet's tail may be thus found. Let S (*Plate* IV. *Aſtronomy. fig.* 23.) be the ſun, E the earth, C the comet, C L the tail when directed from the ſun; then, knowing the place of the comet, we know the angle E C L, E C, and the angle C E L, the angle under which the tail appears; hence we find C L the length of the tail. If the tail deviate by any angle L C M, found from obſervation, we ſhall then know the angle E C M, with C E, and the angle C E M, to find C M.

M. Fatio has ſuggeſted that ſome of the comets have their nodes ſo very near the annual orbit of the earth; that if the earth ſhould happen to be found in that part next the node, at the time of a comet's paſſing by; as the apparent motion of the comet will be incredibly ſwift, ſo its parallax will become very ſenſible; and the proportion thereof to that of the ſun will be given: whence ſuch tranſits of comets will afford the beſt means of determining the diſtance of the earth and ſun.

The comet of 1472, *v. gr.* had a parallax above twenty times greater than the ſun's: and if that of 1618 had come down in the beginning of March to its deſcending node, it would have been much nearer the earth, and its parallax much more notable. But, hitherto, none has threatened the earth with a nearer appulſe than that of 1680: for, by calculation, Dr. Halley finds that November 11th, 1 h. 6 min. P. M. that comet was not above one ſemidiameter of the earth, to the northward of the way of the earth; at which time had the earth been in that part of its orbit, the comet would have had a parallax equal to that of the moon: what might have been the conſequence of ſo near an appulſe, a contact, or, laſtly, a ſhock of the celeſtial bodies?

If the earth had been at this time in that part of her orbit neareſt to that node of the comet, through which it paſſed, their mutual gravitation muſt have cauſed a change in the plane of the orbit of the earth, and in the length of our year. Dr. Halley adds, that if ſo large a body, with ſo rapid a motion as that of this comet near its perihelion, were to ſtrike againſt our earth, a thing by no means impoſſible, the ſhock might reduce this beautiful frame to its original chaos. Whiſton, who, from Flamſteed's meaſure of the apparent diameter of this comet, concluded its nucleus to be about ten times as big as the moon, or equal to a fourth part of our earth, attributes the univerſal deluge, in the time of Noah, to its near approach. His opinion was, that the earth paſſing through the atmoſphere of the comet, attracted from it a conſiderable part of the waters of the flood; that the proximity of the comet raiſed a great tide in the ſubterraneous waters, ſo that the outward cruſt of the earth was changed from ſpherical to oval; that this could not be done without making fiſſures and cracks in it; that through theſe fiſſures the ſubterranean waters were forced, in conſequence of the change of the hollow of the earth into a leſs capacious form;—that, along with the water thus ſqueezed up upon the ſurface of the earth, much ſlime or mud would riſe; which, together with the groſſer parts of the comet's atmoſphere, would, after the ſubſiding of the water partly into the fiſſures and partly into the lower parts of the earth to form the ſea, cover all over to a conſiderable depth the antediluvian earth:—and thus he accounts for trees and bones of animals being found at very great depths in the earth. He alſo ſuppoſed, that before the fall the earth revolved round the ſun in the plane of the ecliptic, keeping always the ſame points of its ſurface towards the ſame fixed ſtars; by this means, as every meridian would come to the ſun but once in a whole revolution, a day and a year were then the ſame: but that a comet ſtriking obliquely upon the earth gave it the diurnal rotation. Moreover, he apprehended, that the antediluvian year conſiſted of 360 days: but that the additional matter depoſited upon the earth from the atmoſphere of the comet at the time of the deluge, ſo retarded its revolution round the ſun, that it is not now performed in leſs than 365 days and about a quarter.

The ſame comet, he imagined, would probably, by coming near the earth after being heated to an immenſe degree in its perihelion, be the inſtrumental cauſe of that great cataſtrophe, the general conflagration, foretold in the Sacred Writings, and from ancient tradition, mentioned by heathen writers. See CONFLAGRATION, DELUGE, and *Theory of the* EARTH.

COMETS, *diſtance of.* The analogy between the periodical time of the planets, and their diſtances from the ſun, diſcovered by Kepler, takes place alſo in the comets. Hence, the mean diſtance of a comet from the ſun may be found by comparing its period with the time of the earth's revolution round the ſun: thus, the period of the comet that appeared in 1531, 1607, 1682, and 1759, being about 76 years, its mean diſtance is found by this proportion; as 1 the ſquare of one year, the earth's periodical time, is to 5776 the ſquare of 76, the comet's periodical time, ſo is 1000000 the cube of 100, the earth's mean diſtance from the ſun, to 5776000000 the cube of the comet's mean diſtance; the cube root of which is 1794, the mean diſtance itſelf, in ſuch parts as the mean diſtance of the earth contains 100. If the perihelion diſtance of this comet 58 be taken from 3588 double the mean diſtance, we ſhall have the aphelion diſtance 3530 of ſuch parts as the diſtance of the earth contains 100; and this is a little more than 35 times the diſtance of the earth from the ſun. By a like method the aphelion diſtance of the comet of 1680 comes out 138 times the mean diſtance of the earth from the ſun, ſuppoſing its period to be 575 years; ſo that this comet in its aphelion goes to more than 14 times the diſtance from the ſun that Saturn does.

The limit of a comet's diſtance may be very eaſily aſcertained from its tail, it being ſuppoſed to be directed from the ſun. Let S (*fig.* 24.) be the ſun, E the earth, E T the line in which the head of the comet appears, E W the line in which the extremity of the tail is obſerved, and draw S T parallel to E W; then the comet is within the diſtance E T; for if the comet were at T, the tail would be directed in a line parallel to E W, and therefore it could never appear in that line. T E W is known by obſervation, and conſequently its equal E T S, together with T E S, the angular diſtance of the comet from the ſun, and E S, to find S T the limit. E.G. On December 21, 1680, the diſtance of the comet from the ſun was 32° 24′, and length of the tail 70°; hence S T : S E :: ſin. 32° 24′ : ſin. 70° :: 4 : 7 nearly; conſequently the comet's diſtance from the ſun was leſs than $\frac{4}{7}$ of the earth's diſtance from the ſun. Hence ſir Iſaac Newton deduced this concluſion, that all comets, whilſt they are viſible, are not further diſtant from the ſun than three times the earth's diſtance from the ſun. This muſt, however, depend upon the goodneſs of the teleſcope, and magnitude of the comet. Vince's Aſtr. vol. i. p. 446.

COMETS, *motion of.* If the paths of comets be ſuppoſed directly parabolical, as ſome have imagined, it would follow, that being impelled toward the ſun by a centripetal force, they deſcend as from ſpaces infinitely diſtant; and by their falls acquire ſuch a velocity, as that they may again run off into the remoteſt regions; ſtill moving upwards, with ſuch a perpetual tendency as never to return. But the frequency of their appearance, and their degree of velocity, which does not exceed what they might acquire by their gravity towards the ſun, ſeem to put it paſt doubt that they move, planet-like, in elliptic orbits, though exceedingly eccentric; and ſo return again, though after very long periods.

The apparent velocity of the comet of 1472, as obſerved by Regiomontanus, was ſuch as to carry it through 40° of a great circle in 24 hours: and that of 1770 was obſerved to move through more than 45° in the laſt 25 hours.

G. S. Doërfell, miniſter at Plaven in Upper Saxony, made obſervations upon the comet of 1680, and found that its motion might very well be repreſented by a parabola, having the ſun in its focus; but not underſtanding the laws by which the motion of a body in a parabola is regulated, he erred conſiderably in his parabola, making the perihelion diſtance about 12 times greater than it was. This was publiſhed five years before the "Principia" of Newton, in which this illuſtrious author proved that Kepler's law, by which the planetary motions are regulated, was a neceſſary reſult of his theory of gravity; whence it immediately followed, that comets were governed by the ſame law; and the obſervations upon them agreed ſo accurately with his theory, as to leave no doubt of its truth.

Newton, Flamſteed, Halley, and the Engliſh aſtronomers, &c. ſeem ſatisfied of the return of the comets. Caſſini, and others of the French, thought it highly probable; but De la Hire, and others, oppoſed it.

Thoſe on the affirmative ſide ſuppoſe the comets to deſcribe orbits prodigiouſly eccentric, inſomuch that we can only ſee them in a very ſmall part of their revolution: out of this, they are loſt in the immenſe ſpaces; hid not only from our eyes, but from our teleſcopes. That little part of their orbit near us, M. Caſſini, &c. has found to paſs between the orbits of Venus and Mars.

For the reaſons of the return of comets, M. Caſſini gives theſe which follow. 1. In conſidering the courſe of the comets, with regard to the fixed ſtars, they are found to keep a conſiderable time in the arc of a great circle, *i. e.* a circle whoſe plane paſſes through the centre of the earth: indeed, they deviate a little from it, chiefly towards the end of their appearance; but this deviation is common to them with the planets.

2. Comets, as well as planets, appear to move ſo much the faſter as they are nearer the earth; and when they are at equal diſtances from their perigee, their velocities are nearly the ſame.

By ſubtracting from their motion the apparent inequality of velocity occaſioned by their different diſtances from the earth, their equal motion might be found: but we ſhould not be certain this motion were their true one; becauſe they might have conſiderable inequalities, not diſtinguiſhable in that ſmall part of their orbit viſible to us. It is, indeed, probable, their real motion, as well as that of the planets, is unequal in itſelf: and hence we have a reaſon why the obſervations made, during the appearance of a comet, cannot give the juſt period of their revolution.

3. There are no two different planets whoſe orbits cut the ecliptic in the ſame angle, whoſe nodes are in the ſame points of the ecliptic, and whoſe apparent velocity in their perigee is the ſame; conſequently, two comets ſeen at different times, yet agreeing with all thoſe three circumſtances, can only be one and the ſame comet. And this were the comets of 1577 and 1680 obſerved to do; and thoſe of 1652 and 1698; not that this exact

agreement, in theſe circumſtances, is abſolutely neceſſary to determine them the ſame comet. M. Caſſini finds the moon herſelf irregular in them all: accordingly, he is of opinion, there are ſeveral which diſagree herein, and yet may be accounted the ſame.

The great objection againſt the return of comets, is, the rarity of their appearance, with regard to the number of revolutions aſſigned to them.

In 1702, there was a comet, or rather the tail of one, ſeen at Rome, which M. Caſſini takes to be the ſame with that obſerved by Ariſtotle, and that ſince ſeen in 1668, which would imply its period to be thirty-four years. Now, it may ſeem ſtrange, that a ſtar which has ſo ſhort a revolution, and of conſequence ſuch frequent returns, ſhould be ſo ſeldom ſeen.—Again, in April, of the ſame year, 1702, a comet was obſerved by Meſſ. Bianchini, and Maraldi, ſuppoſed by the latter to be the ſame with that of 1664, both by reaſon of its motion, velocity, and direction. M. de la Hire took it to have ſome relation to another he had obſerved in 1698, which M. Caſſini refers to that of 1652. On this ſuppoſition, its period appears to be forty-three months; and the number of revolutions between 1652 and 1698, fourteen: but it is hard to ſuppoſe, that in this age, wherein the heavens are ſo narrowly watched, a ſtar ſhould make fourteen appearances unperceived; eſpecially ſuch a ſtar as this which might appear above a month together: and of conſequence be frequently diſengaged from the crepuſcula.

For this reaſon M. Caſſini was very reſerved in maintaining the hypotheſis of the return of comets, and only propoſed thoſe for planets, where the motions are eaſy and ſimple, and are reſolved without ſtraining, or allowing many irregularities.

M. de la Hire propoſes one general difficulty againſt the whole ſyſtem of the return of comets, which would ſeem to hinder any comet from being a planet: and it is this; that by the diſpoſition neceſſarily given to their courſes, they ought to appear as large at firſt as at laſt; and always increaſe, till they arrive at their greateſt proximity to the earth: or, if they ſhould chance not to be obſerved, as ſoon as they become viſible, for want of attention thereto; at leaſt it is impoſſible but they muſt frequently ſhew themſelves before they have arrived at their full magnitude and brightneſs. But he adds, that none were ever yet obſerved till they had arrived at it.

But the appearance of a comet in the month of October 1723, while at a great diſtance, ſo as to be too ſmall and dim to be viewed without a teleſcope, may ſerve to remove this obſtacle, and ſet the comets, ſtill, on the ſame footing with the planets.

Sir Iſaac Newton ſuppoſes, that as thoſe planets which are neareſt the ſun, and revolve in the leaſt orbits, are the ſmalleſt; ſo among the comets, ſuch as in their perihelion come neareſt the ſun, are the ſmalleſt, and revolve in leſſer orbits.

In order to prove that comets deſcribe ellipſes, and not parabolas or hyperbolas, Dr. Halley, in his "Synopſis of the Aſtronomy of Comets," advances the following reaſons. "Hitherto I have conſidered the orbits of comets as exactly parabolic; upon which ſuppoſition it would follow, that comets being impelled towards the ſun, by a centripetal force, would deſcend as from ſpaces infinitely diſtant; and, by their ſo falling acquire ſuch a velocity, as that they may again fly off into the remoteſt parts of the univerſe, moving upwards with a perpetual tendency, ſo as never to return again to the ſun. But ſince they appear frequently enough, and ſince none of them can be found to move with an hyperbolic motion, or a motion ſwifter than what a comet might acquire by its gravity to the ſun, it is highly probable they rather move in very eccentric elliptic orbits, and make their returns after long periods of time; for ſo their number will be determinate, and perhaps not ſo very great. Beſides, the ſpace between the ſun and the fixed ſtars is ſo immenſe, that there is room enough for a comet to revolve, though the period of its revolution be vaſtly long. Now the *latus rectum* of an ellipſis is to the *latus rectum* of a parabola, which has the ſame diſtance in its perihelion, as the diſtance in the aphelion, in the ellipſis, is to the whole axis of the ellipſis. And the velocities are in a ſubduplicate ratio of the ſame; wherefore, in very eccentric orbits, the ratio comes very near to a ratio of equality; and the very ſmall difference which happens, on account of the greater velocity in the parabola, is eaſily compenſated in determining the ſituation of the orbit. The principal uſe therefore of the table of the elements of their motions, and that indeed which induced me to conſtruct it, is, that whenever a new comet ſhall appear, we may be able to know, by comparing together the elements, whether it be any of thoſe which has appeared before, and conſequently to determine its period, and the axis of its orbit, and to foretel its return. And, indeed, there are many things which make me believe, that the comet which Apian obſerved in the year 1531, was the ſame with that which Kepler and Longomontanus more accurately deſcribed in the year 1607; and which I myſelf have ſeen return, and obſerved in the year 1682. All the elements agree, and nothing ſeems to contradict this my opinion, beſides the inequality of the periodic revolutions; which inequality is not ſo great neither, as that it may not be owing to phyſical cauſes. For the motion of Saturn is ſo diſturbed by the reſt of the planets, eſpecially Jupiter, that the periodic time of the planet is uncertain, for ſome whole days together. How much more therefore will a comet be ſubject to ſuch like errors, which riſes almoſt four times higher than Saturn, and whoſe velocity, though increaſed but a very little, would be ſufficient to change its orbit, from an elliptical to a parabolical one. And I am the more confirmed in my opinion of its being the ſame; for, in the year 1456, in the ſummer-time, a comet was ſeen paſſing retrograde between the earth and the ſun, much after the ſame manner; which, although nobody made obſervations upon it, yet, from its period, and the manner of its tranſit, I cannot think different from thoſe I have juſt now mentioned. And ſince looking over the hiſtories of comets, I find, at an equal interval of time, a comet to have been ſeen about Eaſter, in the year 1305, which is another double period of 151 years before the former. Hence, I think, I may venture to foretel that it will return again in the year 1758." Dr. Halley computed, *lævi calamo*, as he himſelf informs us, the effect of Jupiter upon this comet in 1682, and found that it would increaſe its periodic time above a year, in conſequence of which he predicted its return at the end of the year 1758, or the beginning of 1759. M. Clairaut computed the effects both of Saturn and Jupiter, and found that the former would retard its return in the laſt period 100 days, and the latter 511 days; and he determined the time when the comet would come to its perihelion to be in April 15, 1759, obſerving that he might err a month, from neglecting ſmall quantities in the computation. It paſſed the perihelion on March 13, within 33 days of the time computed. Now if we ſuppoſe the time ſtated by Dr. Halley, to mean the time of its paſſing the perihelion, then if we add to that 100 days, ariſing from the action of Saturn which he did not conſider, it will bring it very near to the time in which it did paſs the perhelion, and prove his computation of the effect of Jupiter to have been very accurate. If he mean the time when it would firſt appear, his prediction was very accurate, for it was firſt ſeen on December the 14th, 1758, and his computation of the effects of Jupiter will then be more accurate than could have been expected, conſidering that he made his calculations only by an indirect method, and in a manner profeſſedly not very accurate. Dr. Halley, therefore, had the glory, firſt to foretel the return of a comet, and the event anſwered remarkably to his prediction. He further obſerved, that the action of Jupiter, in the deſcent of the comet towards its perihelion in 1682, would tend to increaſe the inclination of its orbit; and accordingly the inclination in 1682 was found to be 22′ greater than in 1607. From the obſervations of M. Meſſier upon a comet in 1770, M. Edric Proſperin, member of the Royal Academies of Stockholm and Upſal, ſhewed, that a parabolic orbit would not anſwer to its motions, and he recommended it to aſtronomers to ſeek for the elliptic orbit. This laborious taſk was undertaken by M. Lexell, who has ſhewn that an ellipſe, in which the periodic time is about 5 years and 7 months, agrees very well with the obſervations. (See Phil. Tranſ. for 1779.) As the ellipſes which the comets deſcribe are all very eccentric, aſtronomers, for the eaſe of calculation, ſuppoſe them to move in parabolic orbits for that part which lies within the reach of obſervation, by which they can very accurately find the place of the perihelion of a comet, its diſtance from the ſun, the inclination of the plane of its orbit to the ecliptic, and the place of the node. But before we can determine the orbit of a comet, from obſervation, it will be neceſſary to premiſe ſuch particulars reſpecting the motion of a body in a parabola, as may be requiſite for ſuch an inveſtigation.

Accordingly let A P M (*fig.* 25.) be a parabola, S it's focus, A the vertex, P the place of the body, draw P Q perpendicular to A S, and P D perpendicular to the tangent P T, alſo S M perpendicular to A D. Now, by the property of the parabola, Q D is equal to half the latus rectum; hence if $AS = 1$, then $QD = 2$; alſo the angle P S A $= 2$ P D A; therefore if Q D be radius, P Q will be the tangent of P D A, or $\frac{1}{2}$ P S A; hence to the radius A S, P Q will be twice the tangent of $\frac{1}{2}$ P S A; therefore if $2t = PQ$, t will be the tangent of (z) half the true anomaly P S A, to the radius $AS = 1$. Alſo, by the property of the parabola, $AQ \times 4AS = PQ^2$, hence $AQ = t^2$; alſo the area $AQP = \frac{4}{3}t^3$; and as $QS = 1 - t^2$, the area $QPS = t - t^3$; hence the area $ASP = \frac{1}{3}t^3 + t$; alſo the area $ASM = \frac{4}{3}$. Now let a and b be the times in which the comet moves from A to M, and from A to P; then, as the areas deſcribed about S are proportional to the times, $a : b :: \frac{4}{3} : \frac{1}{3}t^3 + t$, therefore $at^3 + 3at = 4b$.

Hence if a, and the true anomaly be given, we have the time $b = \frac{1}{4}at^3 + \frac{3}{4}at$. Alſo, becauſe $a : b :: \frac{4}{3} : \frac{1}{3}t^3 + t$, therefore if the true anomaly, and conſequently t, be given in different parabolas, the times of deſcribing thoſe true anomalies from the perihelions will be in proportion to the times of deſcribing 90° from the perihelions.

If the times a and b be given, the true anomaly may be found from reſolving the cubic equation $t^3 + 3t = \frac{b}{\frac{1}{4}a}$, which may be done thus. In the right-angled triangle C A B, (*fig.* 26.) let $AB = 1$, $AC = \frac{b}{\frac{1}{4}a}$, and compute B C; then find two mean proportionals between $BC + AC$ and $BC - AC$, and their difference is the value of t.

Take the fluxion of $t^3 + 3t = \frac{4b}{a}$, and we have $\dot{t} = \frac{4}{3a} \times \frac{\dot{b}}{1+t^2}$; but $\dot{t} = \overline{1+t^2} \times \dot{z}$; hence we get $2\dot{z} = \frac{8}{3a} \times \frac{\dot{b}}{\overline{1+t^2}^2} = \frac{8}{3a} \times \overline{\text{coſ. } z}^4 \times \dot{b}$ the variation of the true anomaly correſponding to any ſmall variation $\dot{b}$ of time expreſſed in decimals of a day, a being expreſſed in days.

Let S A (*fig.* 25.) be the mean diſtance of the earth from the ſun; then the area of the circle, deſcribed with that radius, will be 3.14159; alſo the area $AMS = \frac{4}{3}$. Now the velocity in the parabola : velocity in the circle :: $\sqrt{2} : 1$; for let P p (*fig.* 27.) be an indefinitely ſmall arc deſcribed by the body, S the place of the ſun, S N a line drawn from the focus S, perpendicular to a tangent to the parabola A P D at the point P; then, 1ſt, *The velocity* u *in any point* P *of the parabola, is as the ſquare root of the parameter to the axis, divided by* S N: for, the velocity is as the arc P p or $u = p$P: now, pM being perpendicular to P S, in the ſimilar right-angled triangles pP M, P S N, S N : S P :: pM : pP $= \frac{pM \times SP}{SN}$. But the parameter is as the ſquare of the deſcribed ſectors; therefore R (the parameter) $= pM^2 \times SP^2$, and $\sqrt{R} = pM \times SP$; and by ſubſtitution, pP or $u = \frac{\sqrt{R}}{SN}$ or $u = \frac{\sqrt{4AS}}{SN}$, from the nature of the parabola. 2dly, *The velocity* u *in any point* P *of the parabola, is to the velocity* V *of a body running through the circumference of a circle with a central force tending to its centre, the radius being equal to* S P, *as* $\sqrt{2} : 1$. For, ſince $u = \frac{\sqrt{4AS}}{SN}$, $u^2 = \frac{4AS}{SN^2}$; or, becauſe $SN^2 = SP \times SA$ (by the property of the Parabola), $u^2 = \frac{4AS}{SP \times AS} = \frac{4}{SP}$. But the circle whoſe radius is S P, being taken as an ellipſis, its parameter is $= 2$ S P; and the velocity V being uniform, it is every-where as $\frac{\sqrt{2SP}}{SP}$; therefore $VV = \frac{2SP}{SP^2} = \frac{2}{SP}$: conſequently $u^2 : V^2 :: \frac{4}{SP} : \frac{2}{SP} :: 2 : 1$; and therefore $u : V :: \sqrt{2} : \sqrt{1} :: \sqrt{2} : 1$.

The areas deſcribed in the ſame time will be in the ſame ratio as the velocities, becauſe at A the motion in each orbit being perpendicular to S A, the areas deſcribed will be as the velocities, and it being ſo in one caſe, it muſt be always ſo, becauſe in each orbit reſpectively equal areas are deſcribed in equal times. But the times of deſcribing any two areas are as the areas directly, and the areas deſcribed in the ſame time inverſely; therefore $\frac{3.14159}{2} : \frac{4}{3\sqrt{2}} \left(\frac{\sqrt{8}}{3}\right)$ :: the time of the revolution in the circle = 365d. 6h. 9′ : the time of deſcribing A M = 109d. 14h. 46′. 20″. Now as the time of deſcribing A M is in a given ratio to the time in the circle, which varies as $AS^{\frac{3}{2}}$, therefore if r = the perihelion diſtance in any other parabola, we have $1^{\frac{3}{2}} : r^{\frac{3}{2}}$ :: 109d. 14h. 46′. 20″ : the time of deſcribing 90° in that parabola from the perihelion. Hence, knowing the time correſponding to any true anomaly in that parabola whoſe perihelion diſtance = 1, we know the time correſponding to the ſame true anomaly in any other parabola, becauſe the times of deſcribing 90° are as the times correſponding to the ſame true anomaly; therefore if n be the number of days correſponding to any given anomaly in that parabola whoſe perihelion diſtance is unity, then $n r^{\frac{3}{2}}$ will be the time t correſponding to the ſame anomaly in that whoſe perihelion diſtance is r; this may be readily found thus. Multiply the log. r by 3 and divide by 2, and to the quotient add the log. n, and the ſum will be the log. of the time required. Hence alſo $n = \frac{t}{r^{\frac{3}{2}}}$; therefore if from the log. t we ſubtract $\frac{3}{2}$ log. r, it gives the log. n of the number of days correſponding to the ſame anomaly in the parabola, whoſe perihelion diſtance $= 1$; hence the anomaly will be found from a table which exhibits the times correſponding to the true anomaly for 200000 days from the perihelion, in that parabola whoſe perihelion diſtance is unity. This table may be conſtructed by the preceding problem, by taking $a = 109,6154$, and aſſuming $b = 1, 2, 3, 4$, &c. and finding the correſponding values of t. Dr. Halley firſt conſtructed a table of this kind. M. de la Caille changed it into a more convenient form, by putting the areas for the times; Mr. Vince has given that which was computed by M. de Lambre. (See Vince's Aſtron. vol. i. p. 454, &c.)

Draw SY perpendicular to the tangent; then $SP : SY :: SY : SA$, therefore $\sqrt{SP} : \sqrt{SA} :: SP : SY ::$ rad. : coſ. PSY, or $\frac{1}{2}$ PSA the true anomaly; or $SP : SA :: \overline{\text{rad.}}^2 : \overline{\text{coſ. } \frac{1}{2} \text{ true anom.}}^2$ Hence, if $SA = 1$, and $a + x = \frac{1}{2}$ PSA, $a - x = \frac{1}{2}$ pSA, then $1 : \sqrt{SP} ::$ coſ. $\overline{a+x}$: rad. and $\sqrt{Sp} : 1 ::$ rad. : coſ. $\overline{a-x}$; hence $\sqrt{Sp} : \sqrt{SP} ::$ coſ. $\overline{a+x}$: coſ. $\overline{a-x}$.

Hence $SP = \frac{SA}{\overline{\text{coſ. } \frac{1}{2} \text{ true anom.}}^2}$, radius being unity; therefore from log. SA ſubtract twice the log. coſ. $\frac{1}{2}$ true anomaly, and the remainder is the log. of the diſtance of the comet from the ſun.

Erect BD (*fig.* 28.) perpendicular to AB, take $BC = AB$, produce AC to E, and draw EDF perpendicular to AE, meeting AF parallel to BD in F, join AD, and draw DG, CH parallel to AB. Then, as $EAF = 45°$, $EA = EF$; alſo $FG = GD = AB$; hence $AF = BD + BA$, and $GH = BD - BA$; alſo, by ſimilar triangles, AF or $BD + BA : CD = GH$ or $BD - BA ::$ EF or $EA : ED ::$ rad. : tan. DAE; but $AB : BD ::$ rad. : tan. BAD. from which ſubtract 45°, and we have $BD + BA : BD - BA ::$ rad. : tan. of that difference. If $BD = \sqrt{SP}$, and $BA = \sqrt{Sp}$, then $\sqrt{SP} : \sqrt{Sp} ::$ rad. : tan. $BAD = \sqrt{\frac{Sp}{SP}}$; hence, to get that angle, take half the difference of the logarithms of SP and Sp, and add 10 to the index (becauſe in the log. tangents, the index of log. tan. of 45°, or log. of rad. $= 1$, is 10, inſtead of 0,) and it gives the log. tangent of the angle; from which take 45°, and we have $\sqrt{SP} + \sqrt{Sp} : \sqrt{SP} - \sqrt{Sp} ::$ rad. : tang. of that difference.

Hence if we know two radii SP, Sp (*fig.* 25.) and the angle PSp between, we can find the two anomalies. For let a be $\frac{1}{4}$ of ASP + ASp, and x be $\frac{1}{4}$ of ASP − ASp, then $\frac{1}{2}$ ASP $= a + x$, and $\frac{1}{2}$ AS$p = a - x$; hence $\sqrt{Sp} : \sqrt{SP} ::$ coſ. $\overline{a+x}$: coſ. $a - x ::$ (by plane Trig.) coſ. $a \times$ coſ. $x -$ ſin. $a \times$ ſin. x : coſ. $a \times$ coſ. $x +$ ſin. $a \times$ ſin. x, therefore $\sqrt{SP} + \sqrt{Sp} : \sqrt{SP} - \sqrt{Sp} ::$ coſ. $a \times$ coſ. x : ſin. $a \times$ ſin. $x :: \frac{\text{coſ. } a}{\text{ſin. } a} : \frac{\text{ſin. } x}{\text{coſ. } x} ::$ cot. a : tan. x. Now the ratio of the two firſt terms is found from the laſt article, and as the angle PSp is given, the value of x will be given, hence we find a, and conſequently we know the ſum and difference of ASP, ASp, therefore we know the angles themſelves. If p lie on the other ſide of A, then we know a, to find x.

Given two diſtances SP, Sp from the focus to the curve of a parabola, and the angle between them, to find the parabola (*fig.* 29.) With the centres P and p, and radii PS, pS, deſcribe two circular arcs $r w t$, $m v n$, to which draw the tangent $a v w b$; draw ST perpendicular to $a b$, and biſect it in A, and it will be the vertex of the parabola; hence we may deſcribe the parabola.

Having the Elements of the Orbit of a Comet, to compute its place at any time.

The elements of the orbit of a comet are, 1. The time when the comet paſſes the perihelion.—2. The place of the perihelion.—3. The diſtance of the perihelion from the ſun.—4. The place of the aſcending node.—5. The inclination of the orbit to the ecliptic. From theſe elements, the place at any time may be computed; and, for example, we ſhall take that given by M. de la Caille in his Aſtronomy. The comet in 1739, which was retrograde, paſſed its perihelion on June 17, at 10h. 9′ 30″ mean time; the place of the perihelion was in 3^s 12° 38′ 40″; the perihelion diſtance was 0.67358, the mean diſtance of the earth from the ſun being unity; the aſcending node was in 0^s 27° 25′ 14″, and the inclination of the orbit 55° 42′ 44″; to compute the place ſeen from the earth on Auguſt 17, at 14′ 20″ mean time.

Let WAV (*fig.* 30) be the parabolic orbit of the comet, N the aſcending node, P the place of the comet, T the correſponding place of the earth, and draw Pv perpendicular to the ecliptic; produce SN, Sv, SP, ST to n, u, p and t the ſphere of the fixed ſtars, and deſcribe the great circles $n p$, $n u$ ♈ t and $p u$.

I. The interval of time from the perihelion to the given time is 61*d.* 4*h.* 10′ 30″ = 61.174, whoſe log. is 1.786567; alſo the log. of .67358 is 9.828388, $\frac{3}{2}$ of which log. (from the nature of logarithms) is 9.742582, which ſubtracted from 1.786567 leaves 2.043985, the log. of 110.6587 days, which, by the table, anſwers to 3^s 0° 21′ 38″ the true anomaly PSA at the given time.

II. Subtract 3^s 0° 21′ 38″ from 3^s 12° 38′ 40″ the place of the perihelion, becauſe the comet was retrograde, and had paſſed the perihelion, and it leaves 12° 17′ 1″ for the heliocentric place p of the comet in its orbit.

III. The longitude of n is 27° 25′ 14″, alſo $p n =$ 27° 25′ 14″ − 12° 17′ 1″ = 15° 8′ 13″; hence rad. : coſ. $p n u$ = 55° 42′ 44′ :: tan. $p n$ = 15° 8′ 13″ : tan. $u n$ = 8° 39′ 53″ the diſtance of the comet from the aſcending node, meaſured upon the ecliptic.

IV. Subtract this value of $u n$ from the place of the node, and there remains 18° 45′ 21″ = ♈ u the true heliocentric place of the comet reduced to the ecliptic.

V. As rad. : ſin. $p n$ = 15° 8′ 13″ :: ſin. $p n u$ = 55° 42′ 44″ : ſin. $p u$ = 12° 27′ 34″ the latitude ſeen from the ſun, which is ſouth.

VI. The true place T of the earth at the ſame time is 10^s 24° 34′ 36″; hence TS♈ = 35° 25′ 24″; therefore TS♈ + ♈Su = TSv = 1^s 24° 10′ 45″. Alſo TS = 1.0115.

VII. By a preceding article, $\overline{\text{coſ. } 45° \, 10' \, 49''}^2 : \overline{\text{rad.}}^2 :: .67358 : SP = 1.3557$.

VIII. As rad. : coſ. $PSv = 12° \, 27' \, 34'' :: SP = 1.3557 : Sv = 1.32377$.

IX. In the triangle TSv, we know TS, Sv and the included angle TSv; hence, by plain trignometry, we find the angle $STv = 77° \, 33' \, 38'' \frac{1}{2}$, which ſubtracted from $4^s \, 24° \, 34' \, 36''$, the place of the ſun, leaves $2^s \, 7° \, 0' \, 57'' \frac{1}{2}$ for the comet's true *geocentric longitude.*

X. Moreover, as ſin. $54° \, 10' \, 45''$: ſin. $77° \, 33' \, 38'' \frac{1}{2}$ :: tan. $PSv = 12° \, 27' \, 34''$: tan. $PTv = 14° \, 54' \, 4''$ the comet's true *geocentric latitude.*

To determine the Orbit of a Comet from Obſervation.

Sir I. Newton firſt reſolved this problem, which he called *Problema longe difficillimum.* The orbit of a comet may be computed from three obſervations; but although theſe data be ſufficient, the direct ſolution of the problem is impracticable. Aſtronomers therefore have ſolved this problem by indirect methods, firſt finding an orbit very near to the truth by mechanical and graphical operations, and then, by computation, correcting it, until ſuch a parabola was found as would ſatisfy the obſervations. Mr. Vince therefore begins, by ſhewing the methods by which the orbit may be nearly determined; and then explains the manner in which it may be corrected by calculation.

M. de la Lande propoſes the following mechanical method of finding the orbit nearly. Divide the diſtance of the earth from the ſun into ten equal parts, and deſcribe ten parabolas whoſe perihelion diſtances are, 1, 2, 3, &c. of theſe parts, and divide theſe parabolas into days from the perihelion, anſwering to the motion of a body in each. Let S (*fig.* 31.) be the ſun, *a*, *b*, *c*, the places of the earth at the times of three obſervations of the comet. Then take three geocentric latitudes and longitudes of the comet, and ſet off the elongations $S a \alpha$, $S b \beta$, $S c \gamma$, in longitude. From *a*, *b*, *c*, extend three fine threads *am*, *bn*, *ep*, vertical to $a\alpha$, $b\beta$, $c\gamma$, making angles with them equal to the geocentric latitudes reſpectively. Then take any one of the parabolas, and placing its focus in S apply the edge to the threads, and obſerve whether you can make it touch them all, and whether the intervals of time cut off by the threads upon the parabola be equal to the reſpective intervals of the obſervations, or very nearly ſo; and if theſe circumſtances take place, you have then gotten the true parabola, or very nearly the true one. But if the parabola do not agree, try others, till you find one which does agree, or very nearly ſo, and you will then have got very nearly the true parabola, whoſe inclination, place of the node, and perihelion, are to be determined as accurately as poſſible from menſuration; alſo the projection upon the ecliptic. If none of theſe parabolas ſhould nearly anſwer, it ſhows, that the perihelion diſtance muſt be greater than the diſtance of the earth from the ſun, in which caſe, other parabolas muſt be conſtructed; but this does not very often happen. This method will determine the elements very nearly; but it would be extremely troubleſome to conſtruct and divide ſo many parabolas, if we only wanted to compute the elements of one comet; for thoſe who purpoſe to make many computations of this kind, it might be worth while to have a ſet of parabolas thus divided. To avoid this trouble therefore, Mr. Vince propoſes to do it in the following manner, by means of one parabola, without dividing it.

Take a firm board perfectly plane, and fix on paper for the projection; let a groove be cut near the edge, and five perpendiculars be moveable in it, ſo that they may be fixed at any diſtances. Let S (*fig.* 32.) repreſent the ſun, and deſcribe any number of circles about it. Compute five geocentric latitudes and longitudes of the comet, from which you will have the five elongations of the comet at the times of the reſpective obſervations. Draw SA, SB, SC, SD, SE, making the angles ASB, BSC, CSD, DSE, equal to the ſun's motion in the intervals of the obſervations; and on any one of the circles, make the angles $S a \alpha$, $S b \beta$, $S c \gamma$, $S d \delta$, $S e \varepsilon$, equal to the reſpective elongations in longitude, and fix the five perpendiculars, ſo that the edge of each may coincide with α, β, γ, δ, ε. From the points *a*, *b*, *c*, *d*, *e*, extend threads to the reſpective perpendiculars, making angles with the plane equal to the geocentric latitudes of the comet; then fix the focus of the parabola in S, and apply its edge to the threads, and if it can be made to touch them all, it will be the parabola required, correſponding to the mean diſtance S *a* of the earth, which we here ſuppoſe to revolve in a circle, as it will be ſufficiently accurate for our purpoſe. If the parabola cannot be made to touch all the threads, change the points *a*, *b*, *c*, *d*, *e*, to ſuch of the other circles as you may judge, from your preſent trial, will be moſt likely to ſucceed, and try again; and by a few repetitions you will get ſuch a diſtance for the earth, that the parabola ſhall touch all the threads, in which poſition, find the inclination, obſerve the place of the node, and meaſure the perihelion diſtance, compared with the earth's diſtance, and you will get very nearly the elements of the orbit.

The next method of approximating to the orbit of a comet, which we ſhall explain, is that given by Boſcovich. Let S (*fig.* 33.) be the ſun, XZ the orbit of the earth, ſuppoſed to be a circle; T the place of the earth at the firſt obſervation, and *t* at the third; draw TC, *tc* to repreſent the obſerved longitudes of the comet; and let L, *l*, λ be the longitudes at the firſt, ſecond, and third obſervations; *m* and *n* the geocentric latitudes of the comet at the firſt and third obſervations; and *t*, T, the intervals of time between the firſt and ſecond, ſecond and third obſervations. Aſſume C for the place of the comet, at the firſt obſervation, reduced to the ecliptic; then to determine the point at the third obſervation, ſay $T \times \text{ſin.} \, \overline{\lambda - l} : t \times \text{ſin.} \, \overline{l - L} :: TC : tc$, and *c* will be nearly the place required; (See Boſcov. "Opuſcula," vol. iii. or ſir H. Englefield's valuable work upon comets, p. 27.) join C*c*, and it will repreſent the path of the comet on the ecliptic, upon this aſſumption. Perpendicular to the ecliptic draw CK, *ck*, taking CK : TC :: tan. *m* : radius, and *ck* : *tc* :: tan. *n* : radius; join K*k*, and it will repreſent the orbit of the comet, if the firſt aſſumption be true. Biſect C*c* in *x*, and draw *xy* parallel to CK, and *y* will biſect K*k*; join *y*S. Let SX = 1; then if *v* be the mean velocity of the earth in its orbit, the velocity of the comet at $y = \frac{\sqrt{2} \times v}{\sqrt{Sy}}$; taking therefore $v = Tt$, compute $\frac{\sqrt{2} \times v}{\sqrt{Sy}}$, and if this be equal to K*k*, meaſured by the ſcale, the aſſumed point C was the true point. But if theſe quantities be not equal, aſſume a new point for C, in doing which, the error of the firſt aſſumption will direct you which way, from the firſt aſſumed point, it muſt be taken, and about how far from it; if, for inſtance, the computed value of K*k* be greater than the true value, and the lines CK, *ck*, are diverging from each other, and receding from the ſun, the point C muſt be taken further from T, and how much further we muſt conjecture from the value of the error, and alſo from hence, that the velocity of the comet diminiſhes as it recedes from the ſun. Theſe conſiderations will lead us to make a ſecond aſſumption near to the truth. Having thus determined the true points C, *c*, very nearly, produce *c* C, *k* K to meet at N, join N S, and it will be the line of the nodes. Draw C *r*, *c z* perpendicular to S N, and the angles K *r* C, *k z c* will meaſure the inclination of the orbit. From the two diſtances S C, S *c*, and the angle between, the parabola may be conſtructed, and applied as in the laſt method, from which the time of paſſing the perihelion may be found.

Another method by which we may readily get the orbit very nearly, is this. Let S (*fig.* 34.) be the ſun, T, *t*, *τ* three places of the earth at the times of the three obſervations; extend three threads T *p*, *t n*, *τ m*, in the directions of the comet, as before directed. Aſſume a point *y* for the place of the comet at the ſecond obſervation, and meaſure S *y*; then if S T = 1, and the velocity of the earth be *v*, the velocity of the comet at *y* will be $\frac{\sqrt{2} \times v}{\sqrt{Sy}}$; let *v* be repreſented by T *t*, *t τ*; and upon any ſtraight edge P Q, ſet off $ce = \frac{\sqrt{2} \times Tt}{\sqrt{Sy}}$, and $ed = \frac{\sqrt{2} \times t\tau}{\sqrt{Sy}}$; then apply the point *e* to *y*, and, by turning about the edge, try whether you can make the point *c* fall in T *p*, and the point *d* in *τ m*; if you find this can not be done, the error will direct you to aſſume another diſtance; and by a very few trials you will find the point *y* where the points *c* and *d* will fall in T *p*, *τ m*. This method is very eaſy in practice, and ſufficiently accurate to obtain a diſtance S *y*, from which you may begin to compute, in order to find the orbit more correctly, when the comet is not too near to the ſun, as, ſays Mr. Vince, I have found by experience.

Having determined the parabola nearly, we firſt aſſume ſome one quantity as known at the firſt and ſecond obſervations, and thence compute the place of the comet at thoſe times, and alſo the time between; and if that time agree with the obſerved interval, you have got a parabola which agrees with the two firſt obſervations; if the times do not agree, alter one of the aſſumed quantities, and ſee how it then agrees; and then, by the rule of falſe, you may correct the ſuppoſition which was altered, and get a parabola which will agree with the two firſt obſervations. In like manner, by altering the other aſſumed quantity, you get another parabola agreeing with the two firſt obſervations. Then ſee how they agree with the third obſervation, and if they do not, a correction muſt be made by proportion, and the three obſervations will be anſwered.

For further particulars we muſt refer to Vince's Aſtronomy, vol. i. p. 428, &c. See alſo "An account of the diſcoveries concerning comets, with the way to find their orbits, and ſome improvements in conſtructing and calculating their places, to which are added new tables, fitted for theſe purpoſes;" by Thomas Barker, Gent. Lond. 1757.

As the comets do not move in parabolas, but in very eccentric ellipſes, it is impoſſible to find a parabola agreeing accurately to all the *data;* it will be ſufficient, therefore, when it agrees very nearly. When great accuracy is required, we muſt take into conſideration the effect of aberration and parallax; the former may be computed in the manner ſtated under the article Aberration, and the latter by taking the horizontal parallax to that of the ſun = 8″,75 as the diſtance of the ſun is to the diſtance of the comet; and then finding the parallax in latitude and longitude.

To aſcertain the periodical time of a Comet, and the axes of its Orbit.

If comets, after having receded from the lower regions of the ſolar ſyſtem to vaſt diſtances beyond the orbits of the moſt diſtant planets return again to the neighbourhood of the ſun, the paths they deſcribe muſt be nearly elliptical; and then, if obſervations have been made ſufficiently exact to be a baſis of the operations, the requiſites of the problem may be determined in the following manner: Let A K B I (*fig.* 35.) be the trajectory of a comet, A B its major axis, I K the minor, S, F, the two foci, the former of which being the place of the ſun, C the place of the comet, C S its diſtance from the ſun, C *c* the ſpace it paſſes over in a very ſmall portion of time, D C E a tangent to the curve in the point C, S D, F E, perpendiculars demitted thereon from the foci: draw S G parallel to the tangent, and join F C. Alſo, let A L B be a circle, deſcribed on the major axis A B; A P T B a rectangle about the ellipſis A I B, and A Q R B a ſquare about the circle A L B. Laſtly, let A N O be the elliptic orbit of any planet, S, *f*, its foci; put S C = *a*, S D = *b*, C *c* = *e*, the time in which it is deſcribed *f*, the major axis of the cometary orbit A B = *x*, of the planetary orbit A O = *q*, the circumference of the circle A V O deſcribed on the ſame axis = *p*, the periodical time of the comet = *t*, and that of the planet = *n*.

The ſpace C *c* deſcribed, the diſtance S C, and the angle S C D, being all determinable by obſervation, are given quantities. The mean diſtance of the comet is A H = S K $= \frac{1}{2}x$, and of the planet is A *g* = S N $= \frac{1}{2}q$; and, becauſe the ſquares of the periodical times are as the cubes of the mean diſtances, we have $\frac{1}{8}q^3 : \frac{1}{8}x^3 :: n^2 : t^2$; therefore $t^2 = \frac{\frac{1}{8}x^3n^2}{\frac{1}{8}q^3}$, and $t = \frac{nx}{q}\sqrt{\frac{x}{q}}$.

But it is neceſſary to find another expreſſion for the periodical time *t*, which may be done thus: becauſe C *c* is a very minute portion of the orbit, it may be eſteemed a right line, and the ſector C S *c* as a rectilineal triangle, whoſe area $\frac{1}{2}$ S D × C *c* $= \frac{1}{2}be$ is given: then, as the area $\frac{1}{2}be$, is to the whole area of the ellipſis A K B I = A; ſo is the time *f*, to the whole periodical time *t*; wherefore $t = \frac{f}{\frac{1}{2}be} \times A$.

Now, in order to determine the area A, we muſt find the ſemiconjugate H K; and here, becauſe A B = S C + F C, we have F C $= x - a$; and by the ſimilar triangles S D C, F E C, we have S C : S D :: F C : F E, that is, $a : b :: x - a : \frac{bx - ab}{a} = FE$; conſequently $FG = FE - GE = \frac{bx - 2ab}{a}$. Again, S C : C D :: F C : C E; or $a : \sqrt{a^2 - b^2} :: x - a : \frac{x - a}{a}\sqrt{a^2 - b^2}$: hence D E or $SG = CE + CD = \frac{x - a}{a}\sqrt{a^2 - b^2} + \sqrt{a^2 - b^2} = \frac{x}{a}\sqrt{a^2 - b^2}$. But $FG = \frac{bx - 2ab}{a}$; therefore $FS = \sqrt{FG^2 + SG^2} = \sqrt{\frac{b^2x^2 - 4ab^2x + 4a^2b^2 + a^2x^2 - b^2x^2}{a^2}} = \sqrt{\frac{a^2x^2 - 4ab^2x + 4a^2b^2}{a^2}}$; and, of courſe, $SH = \frac{1}{2}FS = \sqrt{\frac{a^2x^2 - 4ab^2x + 4a^2b^2}{4a^2}}$.

Moreover, ſince S K = A H $= \frac{1}{2}x$, $HK = \sqrt{SK^2 - SH^2} = \sqrt{\frac{1}{4}x^2 - \frac{a^2x^2 - 4ab^2x + 4a^2b^2}{4a^2}} = \frac{b}{a}\sqrt{ax - a^2}$; therefore $IK = 2\,HK = \frac{2b}{a}\sqrt{ax - a^2}$,

$\sqrt{a x - a^2}$, and $\frac{x b}{a} \sqrt{a x - a^2}$ = area of the rectangle A P T B. Let P be the periphery of the circle A L B, whoſe diameter is x, then its area will be $\frac{1}{2}$ L H × P = $\frac{1}{4} x$ P, and we ſhall have $x^2 : \frac{1}{4} x$ P :: $\frac{1}{2} x^2 : \frac{1}{8} x$ P :: A Q R B : A L B :: A P T B : A I B :: $q^2 : \frac{1}{4} q p$; that is $q^2 : \frac{1}{4} q p$ :: $\frac{x b}{a} \sqrt{a x - a^2} : \frac{b p x}{4 a q} \sqrt{a x - a^2}$ = A I B. But 2 A I B = A I K B = A = $\frac{b p x}{2 a q} \sqrt{a x - a^2}$: therefore, ſubſtituting this value of A, in the preceding expreſſion, we have $t = \frac{f p x}{a e q} \sqrt{a x - a^2}$. Equate this value of t, with that already given, then $\frac{n x}{q} \sqrt{\frac{x}{q}} = \frac{f p x}{a e q} \sqrt{a x - a^2}$; which equation reduced, gives $x = \frac{a f^2 p^2 q}{f^2 p^2 q - a e^2 n^2}$ = A B, the major axis of the comet's elliptical trajectory.

If we ſubſtitute this value of x, in the above equation, for t, we ſhall have $t = \frac{p^3 f^3 n^2 a^{\frac{3}{2}}}{\overline{q f^2 p^2 - a e^2 n^2}|^{\frac{3}{2}}}$ = the periodical time. Alſo, becauſe the conjugate I K $= \frac{2 b}{a} \sqrt{a x - a^2} = c$, we have $x = \frac{c^2 a^2 + 4 b^2 a^2}{4 b^2 a} = \frac{a f^2 p^2 q}{f^2 p^2 q - a e^2 n^2}$, whence by reduction, we find $c = 2 b e n \sqrt{\frac{a}{f^2 p^2 q - a e^2 n^2}}$, the minor axis of the orbit.

From theſe equations, it obviouſly appears, that when the velocity of the comet is ſuch that $f^2 p^2 q = a e^2 n^2$, the axis x will be infinite, and conſequently the trajectory will be a parabola; if $a e^2 n^2$ be greater than $f^2 p^2 q$, the direction of the axis will be on the other ſide of the curve, which will be an hyperbola; in either of which caſes, the comet can never return: but in every inſtance where $f^2 p^2 q$ is greater than $a e^2 n^2$, the comet will deſcribe an ellipſis; among theſe we may compriſe the circle, where $x = 2 a = \frac{a f^2 p^2 q}{f^2 p^2 q - a e^2 n^2}$ and $f^2 p^2 q = 2 a e^2 n^2$, whence e = C $c = \frac{f p}{a} \sqrt{\frac{q}{2 a}}$, the arc of the circle deſcribed in one day, or one hour, according as the value of n is given in days, or hours.

Let the earth be the planet which we ſuppoſed to deſcribe the ellipſis A N O; then its mean diſtance $\frac{1}{2} q = 100000$, or $q = 200000$, and $p = 628318$; alſo the periodical time n = one year: then if C c be the portion of the comet's orbit deſcribed in one day, we have $f = \frac{1}{365.2565} = 0.0027378$. The other expreſſions will become as follow: for the principal axis, $x = \frac{5918.6599235 \times a}{5918.6599235 - a e^2}$, and for the periodical time $t = \frac{4750560000 \times a^{\frac{3}{2}}}{\overline{59\text{[illegible]}35 - a e^2}|^{\frac{3}{2}}}$.

It is extremely difficult to determine, from computation, the elliptic orbit of a comet, to any degree of accuracy; for when the orbit is very eccentric, a very ſmall error in the obſervation will change the computed orbit into a parabola, or hyperbola. Now, from the thickneſs and inequality of the atmoſphere with which the comet is ſurrounded, it is impoſſible to determine, with any great preciſion, when either the limb or centre of the comet paſs the wire at the time of obſervation. And this uncertainty in the obſervations will ſubject the computed orbit to a great error. Hence it happened, that M. Bouguer determined the orbit of the comet in 1729 to be an hyperbola. M. Euler firſt determined the ſame for the comet in 1744; but having received more accurate obſervations, he found it to be an ellipſe. The period of the comet in 1680 appears, from obſervation, to be 575 years, which M. Euler, by his computation, determined to be 166½ years. The only ſafe way to get the period of comets, is to compare the elements of all thoſe which have been computed, and where you find they agree very well, you may conclude that they are elements of the *ſame* comet, it being ſo extremely improbable that the orbits of two different comets ſhould have the ſame inclination, the ſame perihelion diſtance, and the places of the perihelion and node the ſame. Thus, knowing the periodic time, we get the major axis of the ellipſe; and the perihelion diſtance being known, the minor axis will be known. When the elements of the orbits agree, the comets may be the ſame, although the periodic times ſhould vary a little; as that may ariſe from the attraction of the bodies in our ſyſtem, and which may alſo alter all the other elements a little. We have already obſerved, that the comet which appeared in 1759, had its periodic time increaſed conſiderably by the attraction of Jupiter and Saturn. This comet was ſeen in 1682, 1607, and 1531, all the elements agreeing, except a little variation of the periodic time. Dr. Halley ſuſpected the comet in 1680, to have been the ſame which appeared in 1106, 531, and 44 years before Chriſt, when Julius Cæſar was murdered; and that its period was five hundred and ſeventy-five years. Mr. Dunthorne, however, in the Phil. Tranſ. vol. xlvii., has endeavoured to ſhew from a MS. in Pembroke-hall library, that the comet of 1106 could not be the ſame with that of 1680. But M. de la Lande adopts the opinion of Dr. Halley. He alſo conjectured, in the firſt edition of his Synopſis, without repeating it in the ſecond edition, that the comet obſerved by Apian in 1532, was the ſame as that obſerved by Hevelius in 1661; if ſo, it ought to have returned in 1789, or 1790, but it has never been obſerved. The interval between the paſſages of the comet by the perihelion in 1532 and 1661 is 128 years, 89 days, 1 hour, 29 minutes, (32 of the years being biſſextile) which, added to the time of the perihelion in 1661, together with 11 days to reduce it from the Julian to the Gregorian ſtile, which we now uſe, brings out the time of the next perihelion, to be April 27th, 1ʰ 20′, in the year 1789. But M. Mechain having collected all the obſervations in 1532, and calculated the orbit again, found it to be ſenſibly different from that determined by Dr. Halley, which renders it very doubtful whether this was the comet which appeared in 1661; and this doubt is increaſed, by its not appearing in 1790. The comet in 1770, whoſe periodic time M. Lexell computed to be five years and ſeven months, has not been obſerved ſince. There can be no doubt but that the path of this comet, for the time it was obſerved, belonged to an orbit whoſe periodic time was that found by M. Lexell, as the computations for ſuch an orbit agreed ſo very well with the obſervations. But the revolution was probably longer before 1770: for as the comet paſſed very near to Jupiter in 1767, its periodic time might be ſenſibly increaſed by the action of that planet; and as it has not been obſerved ſince, we may conjecture, with M. Lexell, that having paſſed in 1772 again into the ſphere of ſenſible attraction of Jupiter, a new diſturbing force might probably take place and deſtroy the effect of the other. According to the above elements, the comet would be in conjunction with Jupiter on

Auguſt 23, 1779, and its diſtance from Jupiter would be only $\frac{1}{491}$ of its diſtance from the ſun, conſequently the ſun's action would be only $\frac{1}{224}$ times that of Jupiter. What a change muſt this make in the orbit! If the comet returned to its perihelion in March 1776, it would then not be viſible. See M. Lexell's account in the Phil. Tranſ. 1779. The elements of the orbits of the comets in 1264 and 1556 were ſo nearly the ſame, that it is very probable it was the ſame comet; if ſo, it ought to appear again about the year 1848.

Mr. Cole, in his "Theory of Comets," advances an hypotheſis, which, in ſome caſes, may perhaps, be accurate. He ſuppoſes that the orbit of a comet is not an ellipſe; but that, when it paſſes its perihelion, it has acquired ſo great a velocity, that its centripetal force is overcome by its centrifugal, and that conſequently the comet continues to fly off in a parabola or hyperbola, till it come within the attraction of ſome fixed ſtar; that this attraction may give it a new direction, and increaſe its velocity till it come to an apſis below that ſtar, when it may again fly off either in a parabola or hyperbola, and proceed till it fall within the attraction of another ſtar; and thus viſit many different ſyſtems.

Dr. Halley has given us a table of the aſtronomical elements of twenty-four comets, on the ſuppoſition that they moved in parabolas; though he thought it extremely probable that they really moved in very eccentric ellipſes, and conſequently returned after long periods of time. This table commences with the year 1337, and cloſes with 1698. By means of this table, and others ſimilar to it, it may be determined whenever a new comet ſhall appear, by comparing it therewith, whether it be one of thoſe which have already appeared, and conſequently its period and the axis of its orbit be aſcertained, and its return foretold. See his Synopſis of the Aſtronomy of Comets, annexed to Gregory's Aſtronomy. This was firſt publiſhed in the Philoſophical Tranſactions in 1705, and republiſhed with his Aſtronomical Tables in 1749. M. de la Caille changed this table into another of a more convenient form, by putting the areas for the times.

Another table has ſince been computed, from the obſervations contained in the Philoſophical Tranſactions, De la Caille's Aſtronomy, and De la Lande's Hiſtoire de la Comete de 1759, and Connoiſſance des Movemens Celeſtes 1762 & 1764. In this table are ſeen the elements of twenty-five other comets, from the year 1264 to 1762. The moſt extenſive table for calculating the motions of comets, was computed by M. de Lambre; it is inſerted, as we have already mentioned, in Mr. Vince's Aſtronomy, vol. i. Another table on an extenſive ſcale, computed by Mr. Lee, an ingenious friend of the editor, an excellent aſtronomer, and an attentive obſerver of the heavens, is annexed to this article.

The number of comets that are ſtated in the moſt accurate accounts to have appeared, ſince the commencement of our æra, is about 500; and before that æra, about 100 others are recorded to have been ſeen, though it is probable that not more than half of them were comets.

The elements of the comet of 1770, and the trajectory of its path, may be found in the Tranſactions of the American Philoſophical Society, vol. i.

In Whiſton's Solar Syſtem, the orbits of ſeveral comets are delineated, and the periods of as many of them as were then known, expreſſed.

COMET, *To determine the place and courſe of a.* For this purpoſe, it will be adviſable to take the apparent diameter very frequently; as a judgment may thus be formed of its relative diſtance at different times; its degree of motion, its brightneſs, &c. muſt alſo be regarded; for when it moves with the greateſt velocity, or appears moſt bright, we may infer that it is near its perihelion. If the place of the comet can be obſerved when it has no latitude, the place and time of its being in one of its nodes will then be exactly known; but as this can ſeldom be actually obſerved, theſe elements are generally obtained by approximation from other obſervations. In order to obtain the proper courſe of a comet, obſerve its diſtance from two fixed ſtars, whoſe longitudes and latitudes are known: or, find its altitude when in the ſame azimuth with any two known fixed ſtars; from the diſtance or altitude thus found, calculate the place of the comet by trigonometry, after the manner delivered under PLANET, or in the preceding article. By repeating the obſervations and operations for ſeveral days ſucceſſively, the courſe of the comet will be had.

COMET, *to determine the courſe of a, mechanically, and without any apparatus of inſtruments.* The following ingenious method, by a thread, we owe to Longomontanus: Obſerve four ſtars round the comet, ſuch, as that the comet may be in the interſection of the right lines that join the two oppoſite ſtars; which is eaſily found by means of a thread placed before the eye, and extended over-againſt the ſtars and comet.

Suppoſe, v. gr. the comet's place in the heavens A (*Pl.* IV. *Aſtronomy, fig.* 36.) between the four ſtars, B, C, D, E; where the line joining the ſtars B and D, paſſes through the body of the comet; and the like does the line paſſing through C and E.

On a globe, whereon theſe four ſtars are found, extend a thread through B and D, and another through C and E; the point of interſection will give the place of the comet. This practice being repeated for ſeveral days, the comet's courſe will be had on the globe; which courſe will be found to be a great circle: if this great circle, drawn through three diſtant places, and ſhewing its path among the ſtars, be continued till it interſect the ecliptic, it will ſhew nearly the place of the node, and the inclination of the orbit to the ecliptic. The plane of the node and inclination of the orbit being thus found from ſeveral triplets of places independent of each other, a medium of the reſults may be conſidered as tolerably accurate.

COMET, *to determine the parallax of a.* See PARALLAX.

COMET, *trajectory of a.* See TRAJECTORY.

The Elements of Ninety Seven Comets.

No.	Paſſage through the Perihelion in Mean Time at Greenwich.	Longitude of the Perihelion on the Orbit of the Comet.	Perihelion Diſtance, that of the Earth being 1.	Longitude of the aſcending node.	Inclination of the Orbit.	Motion	Authors who have calculated the Orbit, and Remarks.
	Anno A. C.						
1	539 October 20 15^h 0^m 0^s	10^s 13° 30′ 0″	0.3412	1 28° or 7 28	10° + or —	D	Burckhardt
	Anno Domini, Old Stile.						
2	837 March	9 19 3 0	0.5800	6^s 26° 33′ 0″	10° or 12°	R	Pingré
3	1097 September 21, 21 36 0	11 2 30 0	0.7385	6 27 30 0	73° 30′ 0″	D	Burckhardt
4	1231 January 30, 7 12 40	4 14 48 0	0.9478	0 13 30 0	6 5 0	D	Pingré
5	1264 July 6, 8 0 0	9 21 0 0	0.445	5 19 0 0	36 30 0	D	Dunthorn, } ſuppoſed by ſome to be the ſame as No. 14
	July 17, 6 0 40	9 5 45 0	0.41081	5 28 45 0	30 25 0		Pingré,
6	1299 March 31 7 28 40	0 3 20 0	0.3179	3 17 8 0	68 57 0	R	Pingré
7	1301 October + or —	9^s or 10^s	0.457	0 15° + or —	70° + or —	R	Pingré
8	1337 June 2 6 25 0	1^s 7° 59′ 0″	0.40666	2 24° 21′ 0″	32° 11′ 0″	R	Halley, nearly
	June 1 0 30 40	0 20 0 0	0.6445	2 6 22 0	32 11 0		Pingré
9	1351 November 26 12 0 0	2 9 0 0	1.0000			D	Burckhardt
10	1456 June 8 22 0 0	10 1 0 0	0.5855	1 18 30 0	17 56 0	R	Pingré, period 75½ years
11	1472 February 28 22 23 0	1 15 33 30	0.54273	9 11 46 20	5 20 0	R	Halley, nearly
	1531 Auguſt 24 21 18 30	10 1 39 0	0.56700	1 19 25 0	17 56 0	D	Halley, nearly
12	1532 October 19 22 12 0	3 21 7 0	0.50910	2 20 27 0	32 36 0	D	Halley, nearly, who ſuppoſed it might be the ſame as No. 25
13	1533 June 16 19 30 0	4 27 16 0	0.20280	4 5 44 0	35 49 0	R	Douwes, nearly
14	1556 April 21 20 3 0	9 8 50 0	0.46390	5 25 42 0	32 6 30	D	Halley nearly, ſuppoſed by ſome to be the ſame as No. 5
15	1577 October 26 18 45 0	4 9 22 0	0.18342	0 25 52 0	74 32 45	R	Halley, nearly
16	1580 November 28 13 44 40	3 19 11 5	0.59553	0 19 7 37	64 51 50	D	Pingré
	15 0 0	3 19 5 50	0.59628	0 18 57 20	64 40 0		Halley
17	1582 May 7	8^s 5° or 9^s 11°	0.23 or 0.04	7^s 5° or 21°	59° or 61°	R	Pingré nearly
18	1585 September 27 19 20 0	0^s 8° 51′ 0″	1.09358	1^s 7° 42′ 30″	6° 4′ 0″	D	Halley
19	1590 January 29 3 45 0	7 6 54 30	0.57661	5 15 30 40	29 40 40	R	Halley
20	1593 July 8 13 38 40	5 26 19 0	0.08911	5 14 15 0	87 58 0	D	De la Caille, nearly
21	1596 July 31 19 55 0	7 18 16 0	0.51293	10 12 12 30	55 12 0	R	Halley
	29 15 33 40	7 28 30 50	0.549415	10 15 36 50	52 9 45	R	Pingré
*10	1607 October 16 3 50 0	10 2 16 0	0.58680	1 20 21 0	17 2 0	R	Halley, vide Principia Newtoni, p. 524
22	1618 Auguſt 7 3 2 40	10 18 20 0	0.51298	9 23 25 0	21 28 0	D	Pingré, nearly
23	1618 October 29 12 23 0	0 2 14 0	0.37975	2 16 1 0	37 34 0	D	Halley
24	1652 November 2 15 40 0	0 28 18 40	0.84750	2 28 10 0	79 28 0	D	Halley
25	6661 January 16 23 41 0	3 25 58 40	0.44851	2 22 30 30	32 35 50	D	Halley, who ſuſpected it might be the ſame as No. 12
26	1664 November 24 11 52 0	4 10 41 25	1.025755	2 21 13 55	21 18 40	R	Halley, vide Principia Newtoni, p. 520
27	1665 April 14 5 15 30	2 11 54 30	0.10649	7 18 2 0	76 5 0	R	Halley

28	1672 February 20	8 37 0	1 16 59 30	0.69739	9 27 30 30	83 22 10	D	Halley
29	1677 April 26	0 37 30	4 17 37 5	0.28059	7 26 49 10	79 3 15	R	Halley
30	1678 Auguſt 16	14 3 0	10 27 46 0	1.23801	5 11 40 0	3 4 20	D	Douwes, nearly
31	1680 December 8	0 1 2	8 22 40 10	0.006030	9 1 57 13	61 22 55	D	Pingré
	7	0 4 0	8 22 33 0		9 1 53 0	61 20 20		Halley, vide Principia Newtoni, p. 500
	7	23 9 0	8 22 44 25	0.006170	9 2 2 0	61 6 48		Halley, an elliptical orbit, major axis 138.2957, period 575 years, vide Principia Newtoni, p. 501
	7	20 38 39	8 23 26 48	0.006565	9 2 59 9	58 39 50		Euler, an elliptical orbit, vide Theoria motuum Planet^{m}. & Comet^{m}.
	8	0 4 0	8 27 43 0	0.005920	9 1 53 0	61 20 20		Newton, graphically determined, vide Principia, p. 500
*10	1682 September 4	7 39 0	10 2 52 50	0.58328	1 21 16 30	17 56 0	R	Halley, vide Principia Newtoni, p. 523
		21 31 0	10 1 36 0	0.58250	1 20 48 0	17 42 0		Halley, an elliptical orbit, major axis 1778, period 75½ years, vide Principia Newtoni, p. 524
32	1683 July 2	3 50 0	2 25 29 30	0.56020	5 23 23 0	83 11 0	R	Halley, vide Principia Newtoni, p. 522
33	1684 May 29	10 16 0	7 28 52 0	0.96015	8 28 15 0	65 48 40	D	Halley
34	1686 September 6	14 33 0	2 17 0 30	0.32500	11 20 34 40	31 21 40	D	Halley
35	1689 November 21	14 55 40	8 23 44 45	0.016889	10 23 45 20	69 17 0	R	Pingré, nearly
36	1698 Oƈtober 8	16 57 0	9 0 51 15	0.69129	8 27 44 15	11 46 0	R	Halley
37	1699 January 3	8 22 19	7 2 31 6	0.74400	10 21 45 35	69 20 0	R	De la Caille, nearly
38	1702 March 2	14 12 19	4 18 41 3	0.64590	6 9 25 15	4 30 0	D	De la Caille
39	1706 January 19	4 22 39	2 12 29 10	0.42580	0 13 11 40	55 14 10	D	De la Caille
		4 56 4	2 12 36 25	0.426865	0 13 11 23	55 14 5	D	Struyck
40	1707 November 30	23 29 39	2 19 54 56	0.8597	1 22 46 35	88 36 0	D	De la Caille
		23 43 6	2 19 58 9	0 85904	1 22 50 29	88 37 40	D	Struyck
41	1718 January 3	23 38 39	4 1 30 0	1.02650	4 8 43 0	30 20 0	R	De la Caille
	4	1 14 55	4 1 26 36	1.02565	4 7 55 20	31 12 53		Douwes
42	1723 September 16	16 10 0	1 12 15 20	0.998651	0 14 16 0	49 59 0	R	Bradley, very accurate, vide Principia Newtoni, p. 523
43	1729 June 14	11 6 40	10 22 40 0	4.26140	10 10 32 37	76 58 4	D	De la Caille, vide Mem. de l'Acad. Roy. des Sciences 1763
	12	6 36 2	10 22 16 53	4.0698	10 10 35 15	77 1 58		Douwes
44	1737 January 19	8 20 0	10 25 55 0	0.22282	7 16 22 0	18 20 45	D	Bradley, very accurate
45	1739 June 6	9 59 40	3 12 38 40	0.67358	0 27 15 14	55 42 44	R	De la Caille
46	1742 January 28	4 38 40	7 7 35 13	0.76568	6 5 38 29	66 59 14	R	De la Caille
		4 20 50	7 7 33 44	0.765555	6 5 34 45	67 4 11		Struyck
	27	4 14 59	7 10 49 23	0.7521	6 9 32 7	61 43 44		Euler, vide Theoria motuum Planetarum & Comet^{m}. p. 188
47	1742 December 30	20 25 40	3 2 41 45	0.83501	2 8 21 15	2 19 33	D	De la Caille, nearly
		21 15 16	3 2 58 4	0.838115	2 8 10 48	2 15 50		Struyck
48	1743 September 9	21 16 18	8 6 33 52	0.52157	0 5 16 25	45 48 21	R	Klinkenberg
49	1744 February 19	8 27 0	6 17 12 55	0.22206	1 15 45 20	47 8 36	D	Betts, very accurate, vide Philoſ. Tranſ. vol. 43
50	1747 February 20	7 10 40	9 7 2 0	2.19851	4 27 18 50	79 6 20	R	De la Caille, vide Mem. de l'Acad. 1757
	17	11 44 38	9 10 5 41	2.29388	4 26 58 27	77 56 55		Chezeaux
51	1748 April 17	19 25 0	7 5 0 50	0.84067	7 22 52 16	85 26 57	R	Maraldi
52	1748 June 7	1 24 15	9 6 9 24	0.65525	1 4 39 43	56 59 3	D	Struyck, nearly

		New Style.							
53	1757	October 21	9 46 40	4 2 49 0	0.33800	4 4 0	12 48 0	D	Pingré, vide Mem. de l'Acad. 1757
54	1758	June 11	3 17 40	8 27 38 0	0.21535	7 20 50 0	68 19 0	D	Pingré, vide Mem. de l'Acad. 1759
*10	1759	March 12	13 31 40	10 3 16 0	0.58349	1 23 49 0	17 39 0	R	De la Caille
			13 50 4	10 3 8 10	0.58490	1 23 45 35	17 40 14		De la Lande
			13 48 16	10 3 16 20	0.58360	1 23 49 21	17 35 20		Maraldi, vide Mem. de l'Acad. 1759
55	1759	November 27	0 2 37	1 23 34 19	0.80139	4 19 39 41	79 6 38	D	Pingré
56	1759	December 16	21 3 40	4 18 24 35	0.96599	2 19 50 45	4 51 32	R	De la Caille
57	1762	May 28	15 17 40	3 15 15 0	1.01004	11 19 20 0	84 45 0	D	De la Lande, vide Mem. de l'Acad. 1762 and 1763
			6 51 29	3 14 29 46	1.009856	11 19 2 22	85 3 2		Struyck
		29	0 18 28	3 15 22 23	1.01415	11 18 55 31	85 22 21		Maraldi
58	1763	November 1	19 43 18	2 24 51 54	0.49876	11 26 23 26	72 40 40	D	Pingré, vide Mem. de l'Acad. 1774
			20 58 14	2 25 1 6	0.49820	11 26 27 0	72 28 0		Burckhardt
59	1764	February 12	13 42 16	0 15 14 52	0.55522	4 0 4 33	52 53 31	R	Pingré, vide Mem. de l'Acad. 1771
60	1766	February 17	8 40 40	4 23 15 25	0.50533	8 4 10 50	40 50 20	R	Pingré, nearly, vide Mem. de l'Acad. 1766
61	1766	April 22	20 46 20	8 2 17 53	0.33274	2 14 22 50	11 8 4	D	Pingré, vide Mem. de l'Acad. 1773
62	1769	October 7	12 20 40	4 24 5 54	0.12376	5 25 0 43	40 37 33	D	De la Lande, vide Mem. de l'Acad. 1769 and 1775
			13 36 53	4 24 11 7	0.12272	5 25 6 33	40 48 49		Proſperin
			14 56 39	4 24 16 0	0.12265	5 25 3 0	40 50 0		Euler, an elliptical orbit
			15 18 16	4 24 10 51	0.1227	5 25 4 41	40 49 33		Lexell, an elliptical orbit, vide Mem. de l'Acad. 1775 p. 430
			12 34 9	4 24 11 8	0.1232852	5 25 2 24	40 48 29		Sir Henry Englefield
			15 42 2	4 24 15 53	0.12275	5 25 6 4	40 46 42		Pingré, an elliptical orbit, vide Mem. de l'Acad. 1771
			12 44 38	4 24 11 32	0.12327	5 25 3 40	40 47 56		Legendre, vide Nou. Met. pour la Del^{n}. des Orb. des Cometes
63	1770	Auguſt 14	0 4 4	11 26 26 13	0.676893	4 12 17 3	1 34 30	D	Pingré, an elliptical orbit, major, ſemi axis, 3.08891, period 5.42886 years
		13	12 55 40	11 26 16 26	0.674815	4 12 0 0	1 33 40		Lexell, an elliptical orbit, major, ſemi-axis 3.14786, period 5.585 years, vide Phil. Tranſ. vol. 69
		13	12 37 35	11 26 15 0	0.67435	4 11 54 50	1 34 31		Burckhardt elliptical orbit, major, ſemi-axis 3.1435, period 2035 days
64	1770	November 22	5 38 40	6 28 22 44	0.52824	3 18 42 10	31 25 55	R	Pingré
65	1771	April 18	22 5 7	3 13 28 13	0.90576	0 27 51 0	11 15 20	D	Pingré
		19	5 1 21	3 14 2 54	0.90340	0 27 50 27	11 16 0		Burckhardt, an hyperbolic orbit
66	1772	February 18	20 41 15	3 18 6 22	1.01815	8 12 43 5	18 59 40	D	De la Lande
67	1773	September 5	11 9 25	2 15 35 43	1.13390	4 1 15 37	61 25 21	D	Pingré, an elliptical orbit, vide Mem. l'Acad. 1774 and 1777
			14 33 48	2 15 10 58	0.10120	4 1 5 30	61 14 7		Burckhardt
68	1774	Auguſt 15	10 46 15	10 17 22 4	1.4[illegible]86	6 0 49 38	83 0 25	D	Mechain
69	1779	January 4	2 2 40	2 27 13 11	0.71312	0 25 5 51	32 24 0	D	Mechain
			2 15 10	2 27 13 40	0.7132	0 25 3 57	32 25 30		Chev. d'Angos
70	1780	September 30	18 3 30	8 6 21 18	0.09925	4 4 9 19	53 48 5	R	Mechain
71	1781	July 7	–4 32 0	7 29 11 25	0.775861	2 23 0 38	81 43 26	D	Mechain
72	1781	November 29	12 32 26	0 16 3 28	0.96101	2 17 22 52	27 13 8	R	Mechain
			12 33 25	0 16 3 7	0.960995	2 17 22 55	27 12 4		Legendre, vide Nouvelle Methodes pour la determ. des Orbites des Cometes

73	1783	November 15	5 44 3	1 15 24 46	1.5653	1 24 13 50	53 9 9	D	Mechain, nearly
74	1784	January 21	4 47 40	2 20 44 24	0.70786	1 26 49 21	51 9 12	R	Mechain
75	1784	April 9	21 7 26	10 28 54 57	0.650531	2 26 52 9	47 55 8	R	Chev. d'Angos
76	1785	January 27	7 48 44	3 19 51 56	1.143398	8 24 12 15	70 14 12	D	Mechain
77	1785	April 8	8 58 52	9 27 29 33	0.427300	2 4 33 36	87 31 54	R	Mechain
78	1786	July 7	21 50 52	5 9 25 36	0.41010	6 14 22 40	50 54 28	D	Mechain, vide Mem. de l'Acad. 1786
79	1787	May 10	19 48 40	0 7 44 9	0.34891	3 16 51 36	48 15 51	R	P. de Saron, vide Mem. de l'Acad. 1787
80	1788	November 10	7 25 40	3 9 8 27	1.06301	5 7 10 38	12 28 20	R	Mechain, vide Mem. de l'Acad. 1788
81	1788	November 20	9 4 25	0 23 12 22	0.766911	11 21 42 15	64 52 32	D	Mechain
82	1790	January 15	5 5 39	2 0 14 32	0.7581	5 26 11 46	31 54 15	R	De Saron, vide Connoiſſance des Tems
83	1790	January 28	7 36 13	3 21 44 37	1.063286	8 27 8 37	56 58 13	D	Mechain
84	1790	May 21	5 46 54	9 3 43 27	0.79796	1 3 11 2	63 52 27	R	La Lande
85	1792	January 13	13 35 9	1 6 29 42	1.293	6 10 46 15	39 46 55	D	
86	1795	December 14	23 17 53	5 13 37 0	0.227	11 29 11 0	24 17 0	D	Zach
		15	15 6 18	5 7 37 0	0.258	11 13 23 0	20 3 0		Bouvard
		14	18 43 0	5 15 34 0	0.215	0 1 7 0	24 42 0		Profperin
87	1796	April 2	19 47 51	6 12 44 0	1.578	0 17 2 0	64 55 0	R	Olbers
88	1797	July 9	2 44 31	1 19 34 48	0.52545	10 29 16 35	50 35 50	R	Bouvard
89	1798	April 4	11 32 21	3 14 59 0	0.48476	4 2 9 0	43 52 16	D	Burckhardt
90	1798	December 31	12 58 57	1 4 29 48	0.77968	8 9 30 44	42 23 25		Burckhardt
91	1799	September 7	5 49 48	0 3 39 12	0.839865	3 9 31 59	50 55 37	R	Mechain
			5 34 4	0 3 39 10	0.840178	3 9 27 19	50 57 30		Von Zach vide Connoiſſance des Tems, an. 12.
			4 24 39	0 3 36 0		3 9 34 0	50 52 30		Burckhardt
92	1799	December 25	21 30 49	6 10 20 12	0.625810	10 26 49 11	77 1 38	R	Mechain. De la Lande thinks it may be the ſame as No. 37
93	1801	Auguſt 8	13 22 39	6 3 49 0	0.2617	1 14 28 0	21 20 0	R	Burckhardt
94	1803	September 9	20 33 54	11 2 8 0	1.0942	10 10 17 0	57 0 0	D	Mechain, vide Conn. des Tems, an. 14
95	1804	Februay 13	13 31 7	4 28 44 51	1.07117	5 26 47 58	56 28 40	D	Gauſs, vide Connoiſſance des Tems, an. 15
		13	15 30 39	4 28 53 32	1.072277	5 26 49 47	56 44 20	D	vide Connoiſſance des Tems, an. 1808
96	1805	November 18	0 15 39	4 29 0 28	0.37567	11 15 6 51	15 58 12	D	Legendre, vide Nou. Meth. pour la Del^n. des Orbites
97	1805	December 31	6 1 36	3 19 23 40	0.89159	8 10 35 24	16 25 25	D	Legendre. des Cometes.

On the ſubject of *Comets*, ſee Newton's Principia, lib. iii. Halley's Synopſis of Comets; Sejour Eſſai ſur les Cometes, 1775; M. Pingre's Cometographie, 2 vols. 4to. 1781, Sir H. Englefield's work "On the determination of the Orbits of Comets;" M. Bode's General Conſiderations on the ſituations of the Orbits of all the Planets and Comets which have hitherto been calculated, inſerted in the Memoirs of the Academy of Sciences of Berlin; Dr. Gregory's Aſtronomy; O. Gregory's Treatiſe on Aſtronomy, 1803; De la Lande, Theorie des Cometes, 1759; and Aſtronomie, vol. iii.; An Account of the Diſcoveries concerning Comets, with the way to find their Orbits, &c. by Thomas Barker, 1757; Vince's Aſtronomy, &c. &c.

COMETARIUM, or Cometarian, in *Mechanics*, is the name of a machine, contrived by Dr. Deſaguliers, for the purpoſe of exhibiting and explaining the eccentric motion of a comet, agreeably to that law, of planetary motion, by which equal areas are deſcribed by the radius vector in equal times. Ben. Martin has given an account of this machine, in his "Young Gentleman and Lady's Philoſophy," and Mr. Ferguſon has deſcribed it ſtill more particularly in his "Aſtronomy," but as thoſe authors have not given a perſpective view of the parts of action, we have thought it neceſſary to give a new drawing, ſuch as we conceive will render the mechaniſm clearly intelligible to every reader. In *Plate* I. of *Planetary Machines*, *fig.* 1. repreſents the cover of the cometarium, taken from the box which contains the wheel-work, and *fig.* 2. ſhews the box and its contents, with the exception of the cover, and one ſide, the latter of which is ſuppoſed to be removed, in order to diſcloſe more fully the diſpoſition of all the contained parts. A B in *fig.* 2. is the bottom of the box, which ſupports the lower pivots of the three vertical arbors; C D is a longitudinal bar inſerted into the ends of the box, and bearing the upper pivots of the ſaid arbors, as may be clearly ſeen in the figure; E is the handle put on the end of the horizontal arbor E F, which arbor is pivoted into the front and back ſides of the box; on this horizontal arbor, under the letter C, is an endleſs ſcrew actuating the wheel G, with teeth not rounded but cut a little obliquely; the number of which teeth may be aſſumed at option, to correſpond to an aliquot part of a circle, ſuppoſe 72, in which caſe one tooth, or revolution of the handle, will correſpond to 5°; at the inferior end of the arbor of wheel G, is fixed another wheel H, of the ſame number of teeth, that actuates a ſimilar wheel I, on the ſecond vertical arbor; ſo that theſe two wheels, H and I, alſo revolve each in $\frac{1}{72}$d part of a circle, or 5°, at each revolution of the handle. Mr. Ferguſon has placed the endleſs ſcrew as in *fig.* 2. of *Plate* II., between the wheels H and I in ſuch a way, as to impel them both in contrary directions at the ſame time, which conſtruction is ſtill more ſimple, as it diſpenſes altogether with the wheel G, and requires no rounding of the teeth; to the arbor of wheel I a ſolid plate K, in the form of an ellipſe, is fixed faſt at a point out of the centre, and has a groove round its edge to admit a cord to paſs round it; and a ſecond elliptic plate L, every way ſimilar to plate K, is attached, at a point equally diſtant from the centre, to the third vertical arbor, but in ſuch a way, that, when an endleſs cord is made to embrace the grooves of both, after croſſing between them, the long radius of one is always directed towards the ſhort radius of the other reciprocally, ſo that as the radius of plate K continues to lengthen in revolving half round, the radius of L continues to ſhorten, and *vice verſâ* during the other half of the revolution; this alteration of gradual lengthening and ſhortening of the radii, of the equably moving elliptic plate K, produces an alternate acceleration and retardation of motion in the plate L, ſuch as correſponds with the equated motion of a heavenly body, deſcribing equal areas in equal times; and the quantity of eccentricity given to the elliptic plates determines the quantum of the greateſt equation in the orbit to be repreſented. Above the croſs-bar CD is fixed an elliptic plate M, by two ſcrews, ſeen in both the figures, round which the comet O is confined to move in its motion round N, the ſun, which is a ball attached to the ſuperior end of the arbor of the plate L of unequable motion; to the ball N, the arm or radius vector N O is attached, which therefore alſo moves with alternate accelerations and retardations of motion along with plate L; and as the comet O has liberty to ſlide along the radius vector, while a ſtud under it penetrates the black elliptic groove, made in the cover round the plate M, the variation of diſtances is thereby effected as the comet is carried round: the point of the greateſt diſtance, where the motion is ſloweſt, is called the *aphelion*, from απο, *from*, and ἡλιον, the *ſun*, and the point of neareſt diſtance, where the motion is quickeſt, is called the *perihelion*, from περι, *round*, and ἡλιον, the *ſun*. The two circles of ſigns, and alſo the graduated ellipſe, are marked on the cover of the machine, and the arm G, in *fig.* 1, is placed on the equably moving arbor of wheel G, in *fig.* 2, ſo that when the arm G moves through the ſigns in the ſmall circle, by equal arcs in equal times, the arm N O moveable round the point N, paſſes through correſponding unequal arcs in the larger circle of ſigns, while the difference between the places of the two ſaid arms ſhews the quantity of proſthaphæreſis, or equation in any ſituation in the large graduated circle, which is aſſumed to be parallel to the comet's orbit. In order that the nature of the comet's motion may be the more apparent to the eye of a ſpectator, when referred to its own orbit, the ſmall ellipſe, beyond the darkened aperture that regulates the diſtances, is alſo divided into ſigns, but in ſuch a way, that the angles ſubtended by each ſign, when referred to the point N, or centre of motion, are unequal among themſelves throughout each ſix ſucceſſive ſigns, and if lines were drawn from each point where the comet is found at the end of each day or week, to the point N, they would include equal areas, or plane ſurfaces taken geometrically; in ſome of the machines indeed, thoſe lines are actually drawn, and the ſeparate triangular areas correſponding to each equidiſtant period are painted alternately black and white, to render the doctrine of the celebrated Kepler ſtill more evident to the ſenſes. The principal objections to the conſtruction of the machine before us is, that the comet O is apt to move by jerks in certain parts of the orbit, particularly when the eccentricity is great; and alſo the cord is liable to ſlide in ſome ſituations, without producing the correſponding motion in the elliptic plates K and L; the latter of which objections has been attempted to be obviated, by attaching forked pieces of metal to the plane of one of the elliptic plates near its end, and pins to the other, as in *fig.* 2. *Plate* II. to form a kind of teeth; but a better plan, and which has been adopted ſometimes in practice, where the eccentricity is not very great, is to cut the elliptic plates themſelves into toothed wheels, and to ſubſtitute them for the wheels H and I, in which caſe the cord may be diſpenſed with altogether, and the arm N O, we preſume, will thus be leſs liable to jerks.—After all, however, this machine does not profeſs to repreſent the period of a revolution of any of the comets or planetary bodies, but is intended merely to explain the law of their motion, which it will do in a very ſatisfactory manner, when well made; and it is eaſy to ſee, that, as the plate M may be fixed more or leſs out of the centre, ſuch a change of diſtances may be produced, as ſhall correſpond to the changes of angular velocity; which is the chief difficulty to be overcome in the mechanical repreſentation of the orbit.

New Cometarium by Mr. Jones.

Subſequently to our writing the preceding account of the cometarium, Mr. W. Jones, optician in Holborn, has favoured us with a drawing and deſcription of a new conſtruction of the cometarium, which he ſays is free from the jerks that we have ſtated as an objection to the plan of Dr. Deſaguliers, and which, therefore, we lay before the public as nearly in the author's own words as our arrangement and obſervations on it will admit.

Fig. 1. of *Plate* II. of *Planetary Machines* is a repreſentation of the external part of the machine, which is not confined to any particular dimenſions, but has generally been made as follows; *viz.* A B C D is a mahogany box, about 12 inches long, 9 wide, and 4½ deep, containing the wheelwork that gives motion to the comet *x*; the dark elliptical ſpace is a groove repreſenting the orbit of the comet, which is carried round in the direction of the alphabetical order of the letters. The point *a* is the perihelion, and the point *g* the aphelion; and the triangular ſpaces or areas, *a* S *b*, *b* S *c*, &c. are all reſpectively equal to each other: in one turn of the handle N, the comet *x* is moved over one of theſe areas; conſequently, in the ſame time that it moves from *f* to *g*, or from *g* to *h*, it moves from *m* to *a*, or from *a* to *b*, and in like manner through each ſucceeding area, the quickeſt motion being at *a*, and the ſloweſt at *g*; thus ſhowing that the velocity of a comet in its orbit continually and gradually decreaſes from the perihelion *a* to the aphelion *g*, and increaſes in the ſame proportion from the aphelion to the perihelion. The elliptical orbit is divided into twelve ſigns with their reſpective degrees, and in a ſimilar manner is the circle *n o p s t*, which repreſents a great circle in the heavens, and to which the motion of the comet is referred by the extremity of the wire W, moveable at S, and actuated by the ſtem of the comet, which ſlides againſt it, in and out alternately, in its progreſs in the orbit. During the comet's motion in its orbit from *f* to *g*, its apparent motion is only about five degrees in this circle, as pointed out by the end of the wire; but in the ſame time as the comet moves from *m* to *a*, or from *a* to *b*, it appears to deſcribe the large angular ſpace *t n*, or *n o* in the heavens, each of which arcs contains about 120°, or four ſigns; and if the eccentricity of the orbit were ſtill greater, the greater would be the difference between the two extreme velocities. The figures 1, 2, 3, 4, &c. to 12, repreſent a ſmall comparative circular orbit, for ſhewing the equable motion of a body, ſuppoſed to move concentrically round the ſun S, and to deſcribe equal arcs, as well as equal areas, 1 S 2, 2 S 3, &c. in equal times with thoſe of the comet *x* in its elliptic orbit before mentioned. Suppoſe now the bodies *x* and *o* to commence their motions at the ſame inſtant from the points *a* and 1, and to arrive at the ſame reſpective points again, after a revolution of each, at the ſame inſtant, it will be obſerved, during their progreſs, that the body *x* will be more forward than the body *o* in the firſt ſix ſigns from *a* to *g*, but more backward in the next ſigns from *g* to *a*, and the difference between the places of the two bodies, in any part of the ſmall or equable orbit, will be the *equation* of the centre in that particular part. At the points *a*, 1, and *g*, 7, the bodies are together, and conſequently the equation vaniſhes, and from thence begins to take an oppoſite character, changing from plus to minus, and *vice verſâ* at the reſpective points; alſo, the diſtance from the aphelion point, in the ſmall orbit, is called the *mean anomaly*, reckoned in ſigns and degrees; and the diſtance from *a*, in the large circle, reckoned in a ſimilar manner, is called the *true* or *equated anomaly*. Thus the reaſon appears evident, why, in aſtronomical calculations taken from the tables of Dr. Halley, or la Lande, the grand equation of a body moving in an elliptic orbit is *additive* in the firſt ſix ſigns, and *ſubtractive* in the ſecond ſix, with reſpect to the place aſcertained by an aſſumption of mean motion; and the ſame application of the grand equation, after ſome modification of its varying quantity, is uſed from the apogee to the perigee, and back again from the perigee to the apogee of the lunar orbit.

The mechaniſm, by means of which theſe motions are produced in the original cometarium, has been already explained above, from which that of Mr. Jones is very different, and is thus explained by him.

From the circumſtance of its being conſidered as impracticable to obtain an eaſy and uniformly ſteady motion of a comet, by Dr. Deſagulier's mechaniſm, Mr Jones has adopted the plan of uſing only one great wheel revolving on an arbor placed out of the centre, agreeably to the drawing exhibited in *fig.* 3. of *Plate* II. near the point H, and under the cock attached to the plane of the wheel, by three viſible ſcrews. The different parts and action of the mechaniſm are theſe; A B repreſents the inſide bottom of the box, ſeen in *fig.* 1. of the ſame plate; C D is an oblong piece of mahogany, fitted ſo as to ſlide eaſily but ſteadily in the grooves of two parallel ſide-pieces of the ſame wood, made faſt to the bottom, and denoted by the letters E and F; G is the large braſs wheel, about five inches diameter, which we have ſaid revolves on an eccentric arbor, near the point H; over this point is placed the cock, or bent arm, H I, with an oblong ſlit through it, to receive the ſliding piece *a*, which piece ſupports the low end of the ſtem that carries the comet X in *fig.* 1. K and L are two wheels pivoted above into a bridge P, ſhaped like a croſs, and have equal numbers of teeth, the latter of which wheels is actuated by the contrate wheel M, inſerted on the axis B, of the handle N; on the ſame arbor with K, and cloſe under the bridge P, is a ſmall wheel (ſeen in the figure) that impels the large wheel G, round its eccentric arbor; it will not perhaps appear evident to an ordinary mechanic, how the action of the ſmall and large eccentric wheel is rendered continual, and the pitching of the teeth made good all round the great wheel, notwithſtanding the conſtant variation of the diſtances from the eccentric point, which is the centre of its motion, and the ſucceſſive points of its circumference; to effect this apparently difficult purpoſe, conſiderable ingenuity was neceſſary; by examining the croſſes and rim of the large wheel, it will be ſeen, that the thickneſs of the croſſes, and of the teeth, is leſs than of the rim, ſo that the rim may be ſaid to have a circular edge-bar on its plane projecting upwards; this edge-bar is embraced by two rollers, the larger one moving round on the arbor of wheel K, above the ſmall wheel, and the ſmaller one carried by a cock O, faſt to the croſſed bridge P; ſo that, as the great wheel is urged round by the ſmall one, theſe two rollers give motion to the ſliding piece of wood C D, alternately in and out, and conſequently bring the teeth of the wheel borne by this ſliding piece, into a proper depth to act with its ſmall impelling wheel, in every part of the revolution of the former, which therefore acts as well, when the teeth are directed towards the centre of motion, as if the arbor had been in the centre of the wheel, and placed on a ſtationary bar. The wheel, however, has many more teeth coming ſucceſſively into action during one half of its revolution, round the eccentric point of its motion, than it has during the other; and on this circumſtance depends the variable velocity of the comet attached to its arm I, as it regards the ſaid centre of motion. We ſhall have occaſion to ſhew, in another place, that the equation, produced by this cauſe only, would be juſt one half of the proper equation of the centre, or very nearly ſo, provided the ſun were placed exactly over the centre of motion, or eccentric point of the wheel: it is alſo not difficult to ſhew, that if the wheel had no eccentric motion, but had the ſun placed at a ſimilar diſtance out of its centre of motion, one half of the due equation would alſo, in that caſe, be effected, ſuppoſing the circle of ſigns, pointed to by the wire, to be eccentric with regard to the wheel, and ſuppoſing the ſun to be in its centre; now, in the inſtrument before us, theſe two cauſes operate together to produce the total equation due to the orbit, where the eccentricity of the wheel is to its radius, and alſo the eccentricity of the ſun's poſition, at the oppoſite ſide of the wheel's centre, to the ſame, as the eccentricity of the comet is to the radius of its orbit. It muſt, however, be acknowledged, that the joint agency of the two ſaid cauſes of the equation, ſuppoſes the ſliding bar C D to be ſtationary, in which caſe the action of the wheels would ſoon be impeded; conſequently, that part of the equation which depends on the ſun's eccentric poſition, as it regards the wheel's arbor, is variable, and in ſome meaſure muſt derange the ſcale of equations, as it would have been, if the wheel's arbor had been ſtationary; the remedy for this ſmall deviation from perfect accuracy in the ſcale of equations thus produced by the joint agency of three cauſes, is beſt effected by making the ſtraight lines, that form the triangular areas, to correſpond, not to a geometrical meaſurement, but to the actual turns of the handle, one of which will correſpond to each triangular area, when the contrate wheel M, and alſo the ſmall wheel over K, have each one twelfth part of the number of teeth that the great wheel has, which wheel, in that caſe, may have any optional number that is diviſible by twelve. When the centre of the large wheel lies exactly in a line joining the centre of motion H, and the arbor of K, the ſliding board C D is the moſt puſhed out, and the comet is at the aphelion *g*, *fig.* 1. moving ſlowly; but when the centre of the wheel's motion lies between the central point of it and of wheel K, then the comet is at the perihelion *a*, moving quickly. The cock *y*, in *fig.* 1., holds the elliptic plate, with the triangular areas marked on it, and bearing on it the ſun, in ſuch a ſituation, that the groove round its edge, in which the ſtem of the comet moves, limits the diſtance at all times of this body, as it reſpects the ſun, which is done by making the ſliding piece in *fig* 3. move in or out in the ſlit of the arm I, already deſcribed. Thus the jerks of the old cometarium are avoided, and all its apparent properties are preſerved, except that a portion of the large graduated celeſtial circle is unavoidably concealed by the ſuperior elliptic plate of triangular areas.

COMETES, in *Botany*, (*κομητης*, *crinitus*, ſo called on account of the remarkably hiſpid involucres,) Linn. Mant. 39. Schreb. 211. Willd. 211. Lam. Ill. 203. Juſſ. 437. Claſs and order, *tetrandria monogynia*. Nat. Ord. *Tricoccæ.*

Gen. Ch. *Calyx common.* Involucre four-leaved, incloſing three ſeſſile flowers, oblong, equal, ciliate-hiſpid. *Calyx proper.* Perianth four-leaved; leaflets oblong, equal the length of the involucre. *Cor.* none. *Stam.* Filaments four, capillary, the length of the involucre; anthers roundiſh. *Piſt.* Germ ſuperior, roundiſh; ſtyle filiform; ſtigma trifid. *Peric.* Capſule tricoccous. *Seeds* ſolitary.

Eſſ. Ch. Involucre four-leaved, three-flowered. Calyx proper, four-leaved. Corolla none. Capſule tricoccous.

Sp. C. *alternifolia.* Linn. Syſt. Nat. Mart. Willd. Burm. Ind. 39. tab. 15. fig. 5. (Clinopodium parvum ſinicum; Pluk. Alm. 61. tab. 380. fig. 4.) *Root* annual. *Stem* a foot high, herbaceous. *Leaves* oppoſite, narrowing into a petiole, inverſely egg-ſhaped, acuminate, quite entire. *Peduncles* in pairs, terminal and axillary. A native of Surat.

COMETITES, in *Natural Hiſtory*, a name given by ſome writers to a kind of aſtroites, which has ſtars much larger than thoſe of the common kind, and therefore called *comets*.

COMEUS, in *Mythology*, a ſurname of Apollo, under which title he was worſhipped at Seleucia, whence his ſtatue was carried to Rome, and placed in the temple of Apollo Palatine.

COMFETS, Stony, in *Natural Hiſtory*, drop-ſtones or confetts. Theſe are ſtalactites, broken into ſhort pieces, ſomewhat reſembling comfets, and certain kinds of ſugar-plums, and which in Italy and other places are ſometimes put up in boxes and labelled, ſo as to deceive ſtrangers at firſt ſight, in ſuppoſing them to be real comfets.

COMFLOENTA, in *Ancient Geography*, a town of Spain, in the Tarragonenſian territory, placed by Ptolemy in the country of the Arevaci.

COMFORT, Point, in *Geography*, is the ſouth eaſternmoſt part of Elizabeth-city county, in Virginia, formed by James river, at its mouth in Cheſapeak bay; 19 miles W. by N. of Cape Henry.

COMFREY, or Comphry, in *Botany*. See Symphytum.

COMHOLA, in *Geography*, a river of Ireland, which runs into Bantry bay; 3 miles N. of Bantry.

COMI, in *Ancient Geography*, a people of Aſia, in Bactriana, ſaid by Ptolemy to have dwelled in the vicinity of the *Chomari*.

COMIDAVA, a town of Dacia, according to Ptolemy.

COMILLAH, in *Geography*, a town of Hindooſtan, in the province of Bengal; 160 miles E. N. E. of Calcutta, and 176 E. S. E. of Moorſhedabad. N. lat. 23° 25′. E. long. 91° 15′.

COMIN and Cominot, two ſmall iſlands in the Mediterranean, lying between Malta and Goſa or Gozo; the former ſuppoſed to be the Hepheſtia, or iſle of Vulcan of the ancients. They were formerly uninhabited; but by the care of Vingnacourt, a fort having been built upon each of them for their ſafety, they have been ſince partly inhabited, and that of Comin, which is about 4 or 5 miles in circuit, breeds a large quantity of cattle. See Malta.

COMINES, a town of Flanders, ſituated on the Lis, which divides it into two parts; formerly a conſiderable place, but reduced by war and various accidents; 25 miles S. of Bruges, and 7 N. of Lille.

COMINGE, in *Military Language*, a ſhell of uncommon magnitude, which takes its name from the perſon who invented it.

COMING-TO, in *Sea Language*, denotes the approach of a ſhip's head to the direction of the wind.

COMINIUM, in *Ancient Geography*, a town of Italy in Samnium, which did not ſubſiſt in the time of Pliny.

COMIOLA, in *Botany*, a name given by ſome of the old Roman authors, to the plant commonly called Luteola, or dyers' weed.

COMITATU *commiſſo*, in *Law*, a writ or commiſſion, by which a ſheriff is authoriſed to take upon him the charge of the county.

Comitatu *et caſtro commiſſo*, a writ by which the charge of a county, together with the keeping of a caſtle, is committed to the ſheriff.

COMITATUS, in *Law*, a county. Ingulphus tells us, that England was firſt divided into counties by king Alfred; and the counties into hundreds, and theſe again into tythings; and Forteſcue writes, that *regnum Angliæ per* comitatus, *ut regnum Franciæ per ballivatus, diſtinguitur*. Sometimes it is taken for a territory or juriſdiction of a particular place; as in Mat. Paris, anno 1234. See COUNTY.

COMITATUS *poſſe*. See POSSE.

COMITIA, an aſſembly of the Roman people, either in the Comitium, or Campus Martius, i. e. *Field of Mars;* meeting for the election of magiſtrates, or for conſulting on the important affairs of the republic.

The word comes from the verb *coeo*, or *comeo, to go together*.

There were certain days fixed for theſe aſſemblies, called *dies comitiales;* marked with a C in the calendar of Julius Cæſar. Comitial aſſemblies, held for the election of conſuls, were called *conſular comitia:* in like manner, the other comitia took names from the officer to be created; whether a tribune, a pontiff, ædile, or the like.

There were three kinds of theſe comitia, viz. *curiata*, *centuriata*, and *tributa;* ſo diſtinguiſhed from the manner wherein the people voted, and gave their ſuffrages, *viz.* by curiæ or pariſhes, tribes, or centuries.

The power of calling theſe aſſemblies pertained to moſt of the chief magiſtrates, and ſometimes to the ſovereign pontiff.

Authors make the difference between *comitia* and *concilia*, to conſiſt in this; that in the former the whole people were called together, in the latter only a part.

COMITIA *curiata*. Romulus inſtituted the *comitia curiata*, or the public aſſemblies of the people, called to vote in their ſeveral curiæ: and it is agreed by all that the matters ſubjected to their deciſion, were the choice of all the magiſtrates, and the right of making laws, war, and peace: an ample juriſdiction, comprehending the moſt important articles of government, yet not wholly abſolute, according to Dionyſius, unleſs the ſenate concurred with them. This method of tranſacting all the greater affairs by the people, aſſembled in their curiæ, after it had ſubſiſted through five ſucceſſive reigns, was found to be inconvenient.

Servius Tullius, the ſixth king of Rome, in order to correct the inconvenience of the *comitia curiata*, inſtituted a new diviſion of the people into ſix claſſes, according to a cenſus, or valuation of their eſtates; whence proceed the *comitia centuriata:* then he ſubdivided theſe claſſes into one hundred and ninety-three centuries, and contrived to throw a majority of theſe centuries, that is, ninety-eight of them, into the firſt claſs of the richeſt citizens. By which regulation, though every man voted now in his century, as before, in his curia; yet, as all matters were decided by a majority of the centuries, ſo the balance of power was wholly transferred into the hands of the rich; and the poorer ſort deprived of their former weight and influence in the affairs of ſtate: which wiſe inſtitution was ever after obſerved, through all ſucceeding ages, in the elections of the principal magiſtrates, and the determination of all the principal tranſactions of the republic.

COMITIAL *days*. Paulus Manutius is of opinion, that there were certain days on which the Roman ſenate might regularly be aſſembled; and others on which it could not: and that theſe laſt were called comitial days, and marked under that name in the calendars, as days wholly deſtined, and ſet apart by law, for the aſſemblies of the people. But Sigonius contends, that the ſenate might meet on any of thoſe days, unleſs when the people were actually aſſembled, and tranſacting buſineſs on them; and conſequently that the title of comitial denoted ſuch days only, on which the people might be legally aſſembled, not ſuch on which they were of courſe to be aſſembled. Middlet. of Rom. Senat. p. 138, ſeq.

The truth of the matter ſeems to be this, that though the days called comitial were regularly deſtined to the aſſemblies of the people, yet the ſenate alſo might not only be convened on the ſame, after the popular aſſemblies were diſſolved; but had the power likewiſe, whenever they found it expedient, to ſuperſede and poſtpone the aſſemblies of the people to another day; and, by a particular decree, to authoriſe their own meetings upon them, for the diſpatch of ſome important affair therein ſpecified.

COMITIALIS *morbus*, in *Medicine*, an ancient term for the *epilepſy*, or falling ſickneſs; ſo called, becauſe if any perſon was ſeized with it in the Roman comitia, the aſſembly was immediately diſſolved; this being eſteemed an unlucky omen; or, rather, becauſe thoſe liable to it were chiefly ſeized in the comitia, or great aſſemblies. See EPILEPSY.

COMITIUM, the place where the comitia were ordinarily held, which was a large hall in the Roman Forum: it was a long time open at top; on which account the aſſemblies were often interrupted by bad weather: it was firſt covered over in the time of the ſecond Punic war. See FORUM.

Roſinus obſerves, that the conſuls and tribunes were not created in the *comitium*, but in the Campus Martius.

It was in this place that the roſtra were placed. See COMITIA.

COMITLAN, in *Geography*, a town of North America, in Mexico, and province of Chiapa.

COMITOLO, PAUL, in *Biography*, one of the ableſt of the ſociety of Jeſuits, acquired great reputation by his inſtructions in morality and theology at the commencement of the ſeventeenth century. He died in 1626, at the age of eighty years. His publications are "Catena illuſtrium authorum in Librum Job," tranſlated from the Greek into the Latin language;— "Concilia ſeu reſponſa moralia:" "Doctrina de contractu univerſo." Nouv. Dict. Hiſt.

COMMA, in *Grammar*, a point, or character, formed thus [,]; ſerving to mark a ſhort ſtop, or pauſe; and to divide the members of a period.

The word is formed of κόπτω, *ſeco, I cut*.

It is very difficult to fix the preciſe uſe of the comma; different authors define and uſe it differently: the ordinary doctrine is, that the comma ſerves to diſtinguiſh nouns, verbs, adverbs, and the ſeveral parts of a period that are not neceſſarily joined together. But this conveys no clear, preciſe idea; for what is it to diſtinguiſh the parts of a period not neceſſarily joined together? F. Buffier has carried the doctrine of the comma farther: according to him, the comma ſerves to diſtinguiſh thoſe members of a period, in each whereof is a verb, and the nominative caſe of the verb. Thus, "That ſo many people are pleaſed with trifles is owing to a weakneſs of mind, which makes them love things eaſy to be comprehended."

Beſides this, the comma is uſed to diſtinguiſh, in the ſame member of a period, ſeveral nouns ſubſtantives, or nouns adjectives, or verbs, not united by a conjunction. Thus, "Virtue, wit, knowledge, are the chief advantages of a man:" or, "A man never becomes learned without ſtudying conſtantly, methodically, with a juſt application, &c."

If thoſe words be united in the ſame phraſe by a conjunction, the comma is omitted: thus, "The imagination and the judgment do not always agree." The comma may alſo be omitted between the phraſes that are very ſhort, eſpecially if they depend upon the ſame regimen, and are united by a conjunction: thus, "Alexander conquered Aſia and eſtabliſhed the monarchy of the Greeks."

The ingenious author of the tract "De Ratione Interpungendi," printed with Voſſius's Element. Rhetor. Lond. 1724. lays down the uſe of a comma to be, to diſtinguiſh the ſimple members of a period, or ſentence; i. e. ſuch as only conſiſt of one ſubject, and one definite verb. Thus Cicero, "Venio nunc ad voluptates agricolarum, quibus ego incredibiliter delector, quæ nec ulla impediuntur ſenectute, & mihi ad ſapientis vitam proxime accedere videntur." See SENTENCE.

But this rule does not go throughout; the ſame author inſtancing many particular caſes, not included herein, where yet the comma is adviſable.

Sometimes, *e. gr.* a propoſition includes another, which may be called *partitive*, as being only a part of the entire phraſe; in which caſe, the two are to be divided from each other by commas. Thus, "He always ſays, as he tells us, the fineſt things in the world."

The points, or pauſes in diſcourſe, it is obſerved, are in a kind of muſical proportion: the comma ſtops the reader's voice while he may privately tell one; the ſemicolon, two; the colon, three; and the period, or full-ſtop, four. Others make the ſtop at the colon four: and the period ſix. Profeſſor Ward obſerves, that the ſuſpenſion of the voice ſhould be twice as long for a comma, as between words ſeparated by no mark of diſtinction; thrice for the ſemicolon; and ſo in the ſame proportion. Biſhop Lowth aſſigns to the period a pauſe in duration double to the colon: to the colon, double of the ſemi-colon; and to the ſemicolon, double of the comma: ſo that they are in the ſame proportion to one another as the ſemibreve, the minim, the crotchet, and the quaver in muſic. But whatever be the duration of the ſeveral pauſes, the proportion between them would be ever invariable, if the doctrine of punctuation were exact. Introd. to Engliſh Grammar, ed. 1772. p. 197.

The ancients only made uſe of two kinds of points, or pauſes, in a period; the larger they call *members*, the Greeks *cola*, marked thus [:]; the ſmaller *inciſa*, the Greeks *commata*, thus [,].

The moderns, refining on their predeceſſors, have ſubdivided the firſt into a colon, and ſemi-colon; ſome ſay, without any good foundation in nature; though others maintain the uſefulneſs of the diviſion.

As the member, or colon, divides the period into two parts, each containing a ſenſe, though that imperfect: thus, "Antequam de republica, patres conſcripti, dicam ea quæ dicenda hoc tempore arbitror;" where the ſenſe does not reſt, nor is the period or ſentence perfect, without the addition of "exponam vobis breviter & profectionis & reverſionis meæ:" the comma ſubdivides each member into intermediate diviſions, which, of themſelves, have no preciſe meaning at all: *v. gr.* "Nihil eſt, mihi crede, virtute formoſius, nihil pulchrius, nihil amabilius."

Frequent commas, as on other occaſions they promote perſpicuity and diſtinctneſs, and eaſe the reader, both in the rehearſal and comprehenſion of his author; ſo, in oratory, are of eſpecial uſe and effect; particularly where an adverſary is to be cloſely and pointedly attacked, upbraided, reprehended, wounded, &c. Witneſs that of Cicero againſt Verres: "Non enim nos color iſte ſervilis, non piloſæ genæ, non dentes putridi deceperunt: oculi, ſupercilia, frons, vultus denique totus, qui ſermo quidam tacitus mentis eſt, hic in fraudem, homines impulit: hic, eos, quibus erat ignotus, decepit, fefellit, in fraudem induxit: pauci tua iſta lutulenta vitia novimus; pauci tarditatem ingenii, ſtuporem, debilitatemque linguæ," &c. On the uſe of commas, ſee Murray's Engliſh Grammar, ed. 8. p. 224, &c.

COMMA, in *Muſic*. By this term, theoretic writers on muſic have denominated ſeveral different ſmall intervals in the muſical ſcale, which makes it neceſſary that we ſhould here enter rather minutely into the ſubject. We ſhall begin with that very eſſential interval in almoſt all muſical calculations which is for the moſt part implied by the word comma without further addition, otherwiſe the

COMMA *Major*, *Greater Syntonic* or *Elementary* of various writers, being alſo the *ſchiſm* or *ſchiſma* of Des Cartes, Holder, and others. This interval ſeems firſt to have been noticed by the Greek writers, as the quantity by which the major tone T ($\frac{8}{9}$) exceeds the minor tone *t* ($\frac{9}{10}$); its ratio is $\frac{80}{81}$ and its value in the common or Briggs's logarithms is .9946049,6811, or when reckoned downwards .0053950,3189; and in the logarithms of Euler .017920: this laſt being, in fact, its decimal value, compared with the octave = 1. This comma is uſually marked C, and is equal to 11.0078631 times the *ſchiſma* (Σ) = to 73.55198 times the leſſer fraction *(f)* = to 1400.0913 times the minute (m), and = to $\frac{1}{55.8}$ of the octave nearly.

It is equal to the ſum of 11 ſchiſmas and a minute, ($11\,\Sigma + m$), or of a minor comma and a ſchiſma: it alſo reſults as the difference or remainder, after ſubtracting the following intervals from each other, *viz.* a ſchiſma from a diaſchiſma, a minor comma from an enharmonic dieſis, a ſemitone minor from a ſemitone medius, a ſemitone medius from an apotome, (here obſerving that $\frac{2187}{2048}$ is the apotome and not $\frac{2127}{2048}$, erroneouſly printed in our article), an enharmonic dieſis from a ſemitone minimum, a limma from a ſemitone major, a ſemitone major from a ſemitone maximum, a ſemitone ſubminimum from a ſemitone minor, &c. The comma major is equal to the following additions of intervals, in triples, *viz.* two ſchiſmas, a medius reſidual and a major reſidual; three ſchiſmas, a minor reſidual and a major reſidual; five ſchiſmas, a leſſer fraction and a major reſidual; ten ſchiſmas, a leſſer fraction and a greater fraction; ten ſchiſmas, three leſſer fractions and a medius fraction, &c. See theſe ſeveral articles.

The curious, and thoſe concerned in theſe kinds of calculations, will find a great variety of other relations, in which the comma major ſtands, to the muſical intervals, both great and ſmall, in the elaborate manuſcript treatiſes on muſic by the late Marmaduke Overend, organiſt of Iſleworth, and by the late Dr. Boyce, which Dr. Callcott lately preſented to the library of the Royal Inſtitution in Albemarle-ſtreet, after kindly permitting the writer of this article to peruſe and extract from them for the uſe of this work. The ratio of the major comma may be reſolved into the component primes $\frac{3}{2}\cdot\frac{3}{2}\cdot\frac{3}{2}\cdot\frac{3}{2}\cdot\frac{3}{5}$, and then, according to the method of Mr. Farey in the Philoſophical Magazine, vol. xxvii. p. 193, (ſee our articles *Muſical* PRIMES, and *Tuneable* INTERVALS) can be reſolved into factors $\frac{3}{2}$, $\frac{3}{2}$, $\frac{3}{4}$, $\frac{3}{5}$ or two fifths (V) reverſed, a fourth (IV) and a major ſixth (VI); whence it appears, that the interval of a major comma can be tuned on an inſtrument, having a ſufficient number of ſtrings or pipes, by tuning two fifths downwards in ſucceſſion, and thence upwards a major ſixth, and a minor fourth in ſucceſſion, or VI + 4 − 2 V; where it is obſervable, that two Vths might have been tuned upwards, and a V and 4th downwards, which would alſo produce the interval of a major comma, but *above* the firſt or key note, inſtead of *below* it, as in the firſt caſe, where VI + 4 − 2 V is a negative quantity, as well as all the following. The fraction $\frac{3}{2}\cdot\frac{3}{2}\cdot\frac{3}{2}\cdot\frac{3}{2}\cdot\frac{3}{5}$, does not at firſt appear capable of diviſion into any other tuneable ratios, than the above: but, if we multiply the ſame by $\frac{5}{5}$, it will then be reſolvable into the factors $\frac{3}{5}$, $\frac{3}{5}$, $\frac{5}{4}$, $\frac{3}{2}$, $\frac{3}{2}$, and may be tuned thus, 2 VI — III — 2 V; or multiplying by $\frac{2}{2}$, we can obtain 2 fourths — V — 3; or if by $\frac{4}{4}$, we can get 2 fourths + III — 2 V; if by $\frac{2}{2} \times \frac{2}{2} \times \frac{2}{2}$, we may get 3 fourths — 6 — V; and if by $\frac{2}{2} \times \frac{2}{2} \times \frac{5}{5}$ we ſhall have 2 fourths — III — 2 thirds: and thus, we have ſix methods of exactly tuning a major comma, either above or below any given note, by help of perfect intervals only.

The method above explained, of analyſing muſical ratios or intervals, and expreſſing them in different ways, by the uſe of tuneable intervals only, is calculated to inſtruct the muſical ſtudent, in the curious and important relations which the ſeveral concordant intervals bear to each other: hence we ſee, for inſtance, that if in any chant, or paſſage in a melody, to be performed by voices, by violins, or other perfect inſtruments, any one of the above ſix ſucceſſions of notes were to occur, and the intervals were all to be performed perfect, or without temperament in the melody, the concluſion would not be in the key-note, or that ſet out from, but a comma different in pitch, which property of the muſical ſcale is called *divergency of tune;* ſee that article.

It is obſervable, that all of the above ſix expreſſions or paſſages in melody, which diverge a comma, contain two *fifths* or two *fourths*, each moving the ſame way, and to which the divergency ſeems attributable, when the ſame is not counteracted by a proper ſucceſſion of other intervals. Mr. Maxwell in his "Reformed or Complete Diatonic Scales for the Organ and Violin," &c. in his "Eſſay on Tune," (and ſo does Overend in his manuſcripts) propoſes to mark the riſe of a comma by the acute accent (ʹ), and the fall of the ſame by the grave accent (ˋ), and that when either of theſe are required to be taken off, this mark (°) is to be uſed, in the writing of muſic, in the ſame way as the muſical mark ♮ is uſed, to take off or deſtroy the effect of a ♯ or ♭, which has gone before, either accidentally, or in the ſignature of the ſtaff. Mr. Maxwell ſhews, how a violin performer may practically tune a *comma* upon his inſtrument, in a variety of ways.

Modern writers on the temperament of the muſical ſcale, uſually refer their temperaments, or ſmall corrections, to be applied to the concords, to this major *comma* as a unit or ſtandard, on which account we ſhall preſent our readers with ſome further particulars relating to this ſmall interval of the ſcale. Dr. Robert Smith, in his "Harmonics," Lemma to the 9th propoſition, cor. 4, has demonſtrated, that if any part or parts of a comma *c*, denoted by $\frac{q}{p}c$, be the interval of imperfect uniſons (or temperament), the ratios of the times of their ſingle vibrations will be $161\,\underline{p} - \underline{q}$ to $161\,\underline{p} + \underline{q}$, extremely near: for example, if we want a finite or approximate ratio for a $\frac{1}{4}$ of a comma, we have $q = 1$, $p = 4$, and $\frac{161 \times 4 - 1}{161 \times 4 + 1} = \frac{643}{645}$ is the ratio, the complement arithmetical of its logarithm being 13487, which is true to the laſt of 7 places of figures: in like manner, $\frac{161 \times 3 - 1}{161 \times 3 + 1} = \frac{482}{484}$ or $\frac{241}{242}$ is the ratio anſwering to $\frac{1}{3}c$, or $\sqrt[3]{\frac{80}{81}}$, which is alſo true to the laſt of 7 places in the logarithm, and is ſufficiently accurate for all purpoſes: but it muſt be noticed that theſe are not compoſed of muſical primes.

It may be of uſe here to enquire, what proportion the major *comma*, or ratio of $\frac{80}{81}$, bears, to the hemitone or ratio of $\frac{15}{16}$; for which purpoſe we have the logarithm of the latter divided by the logarithm of the former, or $\frac{280287}{539501} = 5.195282$, the number of major commas in one hemitone (or H) very nearly: and as it may be uſeful on many occaſions for the ſtudent to know, how many major commas make up any interval, we have ſubjoined a ſhort table, ſhewing very exactly how many major commas make up the different concords within the octave, and alſo ſome of the ſmaller diſcords.

Intervals.	Ratios.	N°. of Commas.
VIII	$\frac{1}{2}$	55.797636
VI	$\frac{3}{5}$	41.120938
6th.	$\frac{5}{8}$	37.834808
V	$\frac{2}{3}$	32.639526
4th.	$\frac{3}{4}$	23.158110
III	$\frac{4}{5}$	17.962828
3rd.	$\frac{5}{6}$	14.676696
II	$\frac{8}{9}$	9.481414
IIʹ	$\frac{9}{10}$	8.481414
2nd.	$\frac{15}{16}$	5.195282
comma	$\frac{80}{81}$	1.000000
Key.	$\frac{1}{1}$	0.000000

From the above table it appears, that the octave, whoſe ratio is $\frac{1}{2}$, contains ſomething more than $55\frac{3}{4}$ major commas, the VI. a little more than 41 commas, &c. We ſhall next conſider the

Comma *Minor*, or *Leſſer*, of Rameau, Overend, &c., being alſo the *apotome* minor of Salomon de Caus, Boetius, &c. the *diaſchiſma* of Euler, and the major *dieſis* of Maxwell. This interval ſeems firſt to have been noticed by the Greek writers, as the quantity by which two *ſemitones* major 2 S $\left(\frac{15}{16} \times \frac{15}{16}\right)$ exceeded the *tone* major T $\left(\frac{8}{9}\right)$. Its ratio is $\frac{2025}{2048}$, and its value in Briggs's logarithms .9950950,7525, which reckoned downwards, by its arithmetical complement, is .0049049,2475; and its value in Euler's logarithms is .016295, being that decimal part of an octave. The minor comma is marked by Overend, Dr. Boyce, Dr. Callcott, and others, with a daſhed *c*, (ɛ), ſimilar to the mark for ſcruple in apothecaries weight, but reverſed. (See Philoſophical Magazine, vol. xxviii.) It is equal to 10.007863 times the ſchiſma (Σ) = to .909170 times, or nearly $\frac{10}{11}$ths of the major comma. It is equal to the ſum of ten ſchiſmas and one minute (10 Σ + *m*). And it reſults as the difference when a ſchiſma is taken from a major comma, a diaſchiſma from two major commas, two major commas from a ſemitone minimum, a major comma from an enharmonic dieſis, a ſemitone minor from a limma, an apotome from a ſemitone maximum, a ſemitone minimum from two enharmonic dieſes, a ſemitone medius from a ſemitone major, a leſſer fraction from a priſma, two ſchiſmas from a diaſchiſma, a hyperoche from a ſemitone ſubminimus, two ſemitones medii from a tone major, &c. The comma minor is equal to the following additions of intervals in triples, viz. a ſchiſma, a major reſidual and a medius reſidual; two ſchiſmas, a major reſidual and a minor reſidual; four ſchiſmas, a major reſidual and a leſſer fraction; ſix ſchiſmas, a greater fraction and a medius reſidual; nine ſchiſmas, a greater fraction and a leſſer fraction; nine ſchiſmas, a medius fraction and two leſſer fractions, &c. (See Overend's MS. before quoted.)

The ratio of this interval is compoſed of theſe primes, $\frac{3^4 5^2}{2^{11}}$, which reſolved as ſhewn above, give ^{3}4ths — V — ^{2}III, and ^{3}4ths — ^{2}III — 3, as different methods of practically tuning the minor comma upon an organ, piano-forte, &c.

Comma *Maximum*, of Pythagoras, Boetius, &c. or ancient comma; this interval, whoſe ratio is $\frac{524,288}{531,441} = 12\ \Sigma + m$, is now called the Diaschisma; ſee that article.

Comma, *Greater*, has erroneouſly been applied by ſome to the ratio $\frac{125}{138} = 21\ \Sigma + 2\ m$, which is the *Enharmonic* Diesis; ſee that article.

Comma *Minimum*, according to ſome former writers, expreſſes the ratio $\frac{32768}{32805} = \Sigma$, which is now called the Schisma; ſee that article.

Comma, *Ancient*, according to Galileo, had a ratio of $\frac{625}{648} = 32\ \Sigma + 3\ m$, which is now called the Semitone *Minimus*, which ſee.

Comma *of Philolaus*, is the ratio of $\frac{229}{230}$, intended as an approximation for $\frac{1}{27}$th part of a tone major, but which it exceeds conſiderably; beſides, the fraction $\frac{229}{230}$ is not compoſed of the ſmall or muſical primes 2, 3, and 5, and cannot therefore be admitted into muſical computations.

Comma *of Boetius*, according to Glareanus, alſo of D. Nicola was $\frac{1}{9}$th part of the tone major, or $11\frac{5}{9}\ \Sigma + \frac{2}{9} f + m$, whereof 5 made their ſemitone majus or apotome, and 4 made their ſemitone minus or limma: this interval was anciently ſuppoſed by ſome to be the ſame with the modern diaſchiſma ($12\ \Sigma + m$), but from which it differs, $\frac{4}{9}\ \Sigma - \frac{2}{9} f = .477702 \times \Sigma$, or nearly half a ſchiſma.

The ancients mention another comma, $\frac{1}{8}$ of the tone minor, or $11\frac{5}{8}\ \Sigma + \frac{1}{4} f + m$. (See Dr. Callcott's "Muſical Grammar," pages 119 and 49.

Comma, *Artificial*, of Nicholas Mercator, is the $\frac{1}{53}$ part of the octave, or $11\frac{29}{53}\ \Sigma + \frac{12}{53} f + m$. (See Mercator's "Temperament of the Muſical Scale").

Comma of *Merſennus*. According to Holder's "Treatiſe on Harmony," page 104, Merſennus divided the octave into about 58½ parts, and called one of theſe a comma.

Comma of *Galileo*. The interval $\frac{521441}{524288}$, called a comma in the writings of this author, was intended to have been the diaſchiſma or $\frac{524288}{531441}$, as Mr. Overend has ſhewn, vol. i. p. 140, of his MS. before referred to; the error originated in an erroneous multiplication, in the ſecond figure of Galileo's numerator, by which it was rendered unfit for the muſical ſcale. (See ſir John Hawkins Hiſt. Muſ. vol. i. p. 321.)

Comma *and half* of *Galileo*, has a ratio of $\frac{625}{648} = 32\ \Sigma + 3\ m$, which is the Semitone *minimum*; ſee that article.

Comma *and half* of *Rameau*. This interval reſults from the addition of a major comma and a major reſidual, and is alſo the difference between a ſemitone ſubminimus and a hyperoche; its ratio is $\frac{1953125}{1990625}$, its common logarithm is .9917338,2179 and Euler's log. $0.027456 = 17\ \Sigma - f + 2\ m$. The component primes of this ratio are $\frac{5^9}{2^{13}3^5}$, whence it appears, from the proceſs before explained, that ^{5}3 — ^{4}III, or five minor thirds upwards, and four major thirds downwards, furniſh a practical method of tuning this interval above any note, and the reverſe of this proceſs or ^{4}III — ^{5}3 would tune the ſame below any given note.

Comma, *Semi*. See-Semi-Comma.

Comma *Redundant*, or *ſuperfluous*, or *deficient*, or *diminiſhed;* theſe terms are applied to ſuch intervals, whether concords or diſcords, as exceed or fall ſhort of the true ratio of that interval by a major comma, as a comma redundant fifth, a comma deficient third, &c. Sometimes the term comma is omitted in naming theſe intervals, as a redundant fifth, a deficient third, &c. See Fifth, Third, &c.

COMMAGENE, or Comagene, *Kamaſh*, in *Ancient Geography*, a country of Syria, bounded on the weſt by mount Amanus, on the north by part of mount Taurus, on the eaſt waſhed by the Euphrates; and with regard to its ſouthern boundaries, it is uncertain whether it is contiguous to Seleucia, Cyrrheſtica, or both. It is near the north corner of Syria. This country is mentioned by Strabo, Ptolemy, Pliny, and Ammianus Marcellinus, but they aſſign to it different extents. Its chief cities were Samoſata upon the Euphrates, its capital, Antiochia ad Taurum, Germanicia, Singa, Chaonia, and ſeveral other cities, once of great note, but long ſince utterly deſtroyed. In the time of Antiochus the Great, Commagene was ſubject to the Syrians, and left to him by the treaty of peace which he concluded with Rome, after the famous battle of Magneſia; and hence it is probable, that it was ſeized by ſome of the princes of the Seleucian family, during their inteſtine wars, as no mention of the kings of Commagene occurs till the time of Pompey, and the names of thoſe, who afterwards reigned there, are altogether Syrian. The firſt that is mentioned is Antiochus, who joined with Darius king of Media, in oppoſing the entrance of Pompey into Syria, after the defeat of Tigranes; but, being overcome in battle, he ſubmitted to the conqueror, and was not only confirmed in his kingdom, but rewarded with part of Meſopotamia. In the civil war between Cæſar and Pompey, he ſent large ſupplies to the latter. Antiochus having been put to death by order of Auguſtus, for the aſſaſſination of the Roman ambaſſador, was ſucceeded by Mithridates, on whom Auguſtus beſtowed the kingdom of Commagene, in recompence of his ſervices during the war with Antony and Cleopatra. Upon the death of Mithridates, Antiochus II., the ſon of Antiochus I., was permitted by Auguſtus to take poſſeſſion of the kingdom. This prince died in the reign of Tiberius; and Commagene became a Roman province, and at the requeſt of the nobles, it was governed by a prætor. But Caligula reſtored the kingdom to Antiochus III., the ſon of Antiochus II., adding to it the maritime parts of Cilicia. He was ſucceeded by his ſon Antiochus IV., ſurnamed Epiphanes, who diſtinguiſhed himſelf under Veſpaſian in his war with the Jews, and particularly at the ſiege of Jeruſalem. Veſpaſian, however, having reduced Commagene to the form of a Roman province, would not allow any of the ſons of Antiochus to ſucceed him. This country was afterwards made part of the province called Auguſtophratenſis, or as Ammianus has it, Euphratenſis, and was commonly known by the name of Euphratenſia.

COMMAND, in French *Commandement*, in *Military Language*; the act or action of him who commands; a thing commanded; the right of commanding and making one's ſelf obeyed. The movements of a battalion at exerciſe, are performed by the words which the major or commanding officer pronounces. Hence, *the word of command* is a phraſe in common uſe among military people.

COMMAND denotes alſo authority. Every command falls to the eldeſt officer in the ſame circumſtances, whether he belong to the horſe dragoons, artillery, engineers, foot, or marines. In our ſervice when the commiſſions of two officers are of the ſame date, a retroſpection of former commiſſions takes place, or length of ſervice is examined into, and the diſpute, if any ariſes, is determined according to precedents, and the rules of war.

COMMAND, in the *Royal Navy*, implies the rank or power of an officer, who has the management of a ſhip of war of any kind under twenty guns. He ranks with a major in the army.

COMMANDANT, or COMMANDER, the perſon who commands an army, a brigade, a garriſon, a fort, caſtle, regiment, company, &c.

COMMANDE, a rope made uſe of for boats and pontoons.

COMMANDER, is a name given to a large wooden mallet uſed in a ſhip.

COMMANDERY. See COMMANDRY.

COMMAND *in front*, in *Fortification*, a height, or an eminence, which is directly oppoſite to, or faces the work, that it commands.

COMMAND *in rear*, an eminence or a height, which is directly behind the work that it commands.

COMMAND *in flank*, or *by enfilade*, a height or an eminence on the flank, or prolongation of any part of a work, which it ſees and looks along.

COMMANDEMENT, *Fr.* A commanding ground, an eminence or elevation, which overlooks a poſt or ſtrong place. There are three ſorts of *commandemens;* namely the *commandement in front*, which faces a work, and batters or fires on it in front; the *commandement en revers*, or *in reverſe*, which is behind a work or place, and fires on its rear either directly or obliquely; and the *commandement de courtine or in enfilade*, which is on the flank of a work, and fires along the whole extent of a rectilinear part of it. Nine feet in perpendicular height, conſtitute a ſimple command or *commandement;* 18 feet a double one; 27 feet a triple one; and ſo on.

COMMANDEMENT, *Order of, among the officers of infantry and cavalry.* In France it was cuſtomary in a place of war, and every incloſed city, for the officers of infantry to have the command over thoſe of the cavalry, and on the other hand to be commanded by them in the open field.

COMMANDEUR, Fr. The commander of an order of knights. In ſome orders of chivalry it is the title, which a profeſſed knight takes the moment he pronounces the vows, that ſubjected him to celibacy without his ceaſing on that account to be military. There are, however, in Spain orders of chivalry, that do not require celibacy on the part of the commanders.

COMMANDEUR, in *Ornithology*, the French name of *Oriolus Phoenicæus*, which ſee.

COMMANDINUS, FREDERICK, in *Biography*, was born at Urbino, in Italy, 1509. He was deſcended from a noble family, and celebrated for his great claſſical learning, and for his extenſive acquaintance with the mathematical ſciences. He was patronized by Francis Moria, duke of Urbino, and by his liberality enabled to publiſh tranſlations of various parts of the works of Archimedes: the Conics of Apollonius; the Elements of Euclid, and many other works of high reputation. He was alſo author of a book entitled, "De Centro Gravitatis Solidorum." Bologn. 1565; and of another entitled, "Horologiorum Deſcriptio" Romæ, 1562. He died in 1575; a funeral oration was delivered in his praiſe, by Antonio Toroneo. Gen. Biog.

COMMANDMENT, in a *Legal Senſe*, has various uſes: as, *Commandment of the king*, when on his own mere motion, and from his own mouth, he caſts a man into priſon.

Commandment of the juſtices, is either *abſolute* or *ordinary; abſolute*, as when, on their own authority, and their own diſcretion, they commit a man for contempt, &c. to priſon, as a puniſhment. *Ordinary*, as when they commit him rather for ſafe cuſtody, than puniſhment.—A man committed by an ordinary commandment is repleviable. Perſons committed to priſon by the ſpecial command of the king were not formerly bailable by the court of king's bench; but at this day, the law is otherwiſe. 2. Hawk. P. C. c. 15. § 36.

COMMANDMENT, is alſo uſed for the offence of him who directs or wills another to tranſgreſs the law; as by murder, theft, and the like. See ACCESSORY.

He that commandeth any one to do an unlawful act, is acceſſory to it and all the conſequences, if it be executed in the ſame manner as commanded: but if the commander revoke the command; or if the execution varies from it, or in the nature of the offence; in ſuch caſe he will not be acceſſory. 3 Inſt. 51, 57. 2 Inſt. 182.

In another ſenſe of this word, magiſtrates may command others to aſſiſt them in the execution of their offices, for the doing of juſtice; and ſo may a juſtice of peace, to ſuppreſs riots, apprehend felons; or any officer to keep the king's peace, &c. Bro. 3.

A maſter may command his ſervant to drive another man's cattle out of his ground, to enter into lands, to ſeize goods, to diſtrain for rent, or to do other things; if the thing be not a treſpaſs to others. The commandment of a thing is good; where he that commands hath power to do it; and a verbal command is in moſt caſes ſufficient; unleſs it be, where it is given by a corporation, or when a ſheriff's warrant is to a bailiff to arreſt, &c. Bro. 288. Dyer, 202.

In treſpaſs, &c. the maſter ſhall be accountable for the act of the ſervant done by his command; but ſervants ſhall not be excuſed for committing any crime, when they act by command of their maſter, who have no authority to give ſuch commands. The commands of infants and feme coverts are void; but in forcible entries, &c. an infant or feme covert may be guilty in reſpect of actual violence done by them in perſon.

COMMANDMENTS, *Ten*. See DECALOGUE.

COMMANDRY, or COMMANDERY, a kind of benefice, or fixed revenue belonging to a military order, and conferred on ancient knights, who had done conſiderable ſervice to the order.

There are *ſtrict*, or *regular* commandries, obtained in order, and by merit: there are others of *grace* or *favour*, conferred at the pleaſure of the grand maſter.

There are alſo commandries for the religious in the orders of St. Bernard and St. Antony.—The kings of France have converted ſeveral of the hoſpitals for lepers into commandries of the order of St. Lazarus.

The commandries of Malta are of different kinds; for as the order conſiſts of knights, chaplains, and brother ſervitors, there are peculiar commandries, or revenues, attached to each.

The knight to whom one of theſe benefices or commandries is given, is called commander: which agrees pretty nearly with the *præpoſitus* ſet over the monks in places at a diſtance from the monaſtery, whoſe adminiſtration was called *obedientia*: becauſe depending entirely on the abbot who gave him his commiſſion. Thus it is with the ſimple commanders of Malta, who are rather farmers of the order than beneficiaries; paying a certain tribute, or rent, called *reſponſio*, to the common treaſure of the order.

The commandries belonging to the priory of St. John of Jeruſalem in England, conſiſting of manors, lands, &c. ſuch was that of New Eagle in Lincolnſhire, Selbach in Pembrokeſhire, and Shengay in Cambridgeſhire, were given to Henry VIII. by ſtatute 32 Hen. VIII. c. 20.; ſo that the name of commandries only remains, the power being long ſince extinct.

COMMANI, in *Geography*. See COMMENDO.

COMMANIPULARIS, in *Ancient Military Language*, a Roman ſoldier, who could not ſleep but with his own century, nor fight but under its ſtandard.

COMMANOES, in *Geography*, one of the ſmall Virgin iſles in the Weſt Indies, ſituated to the N.N.E. of Tortola. N. lat. 18° 25′. W. long. 63°.

COMMANTAWANA, a bay on the north coaſt of the iſland of St. Vincent, about one mile eaſt of Tarraty point.

COMMARCHIO, in *Antiquity*, the confines of the land; whence probably is derived the word *marches*. "Imprimis de noſtris landimeris, *commarchionibus*." Du-Cange.

COMMARODES, in *Ancient Geography*, a place of Thrace, in the vicinity of Conſtantinople.

COMMEATUS, in *Military Language*, a paſsport or permiſſion granted to a Roman ſoldier to abſent himſelf from the army for a fixed or limited time. The ſame name was alſo given to ſoldiers' proviſions and their eſcorts.

COMMELIN, JOHN, a diſtinguiſhed botaniſt, was born at Amſterdam, July 23, 1629. He ſucceeded his father as one of the magiſtrates of the city, and while holding this office, was very active in forming a new botanical garden; the ground occupied by the old gardenhaving been taken into the city. The ſecond and third volumes of the "Hortus Indicus Malabaricus," owe much of their value to his judicious notes and obſervations. He publiſhed "Catalogus Plantarum indigenarum Hollandiæ," 1683, 12mo. It contains a liſt of 776 plants; and, in 1789, "Catalogus Plantarum Horti Medici Amſtelodami, pars prior." Theſe have been frequently reprinted. While preparing to complete this work, he died at Amſterdam in 1692.

COMMELIN, GASPAR, nephew to John Commelin. After taking his degree of doctor in medicine, he was appointed profeſſor in botany, and director of the garden at Amſterdam, offices which he filled with diſtinguiſhed ability and attention. He completed the work begun by his uncle, which he publiſhed in 1701. His next production was "Flora Malabarica, ſeu Horti Malabarici Catalogus," ſerving as an index to the Hortus Malabaricus. This was followed by "Præludia Anatomica," 4to. 1703; and the ſame year, "Præludia Botanica," with figures for the benefit of ſtudents in thoſe arts. In 1715, he publiſhed, "Icones Plantarum, preſertim ex Indiis Collectarum," 4to.; and, in 1718, "Botanographia Malabarica, a Nominum Barbariſmis reſtituta," Lugduni Bat. folio. All uſeful to ſtudents in botany, but ſerving rather to ſhew the great induſtry, than the genius of the writer. Haller. Bib. Botan. Eloy. Dict. Hiſt.

COMMELINA, in *Botany*, (ſo named by Plumier from the two brothers, John and Gaſpar Commelin, celebrated Dutch botaniſts.) Plum. 38. Linn. Gen. 62. Schreb. 86. Willd. . 104. Lam. Ill. 83. Gært. 56. Juſſ. 15. Vent. 2. 152. Claſs and order, *triandria monogynia*. Nat. Ord. *Enſatæ*. Linn. *Junci*, Juſſ. *Joncaceæ*, Vent.

Gen. Ch. *Cal. common*. Spathe heart-ſhaped, converging, compreſſed, very large, permanent. *Cal. proper*. Perianth, three leaved; leaves egg-ſhaped, concave. *Cor*. Petals three, unguiculated, larger than the calyx, alternating with its leaves; one ſometimes ſmaller. *Stam*. Filaments two, three, or ſix, awl-ſhaped, reclined; anthers oblong, verſatile. *Nect*. three, often cruciform, fixed to the top of their proper filaments, riſing above the ſtamens. *Piſt*. Germ ſuperior, roundiſh; ſtyle awl-ſhaped, revolute, ſtigma ſimple. *Peric*. Capſule, ſomewhat globular, two or three-celled; two or three-valved. *Seeds* few.

Eſſ. Ch. Calyx proper, three-leaved. Petals three, unguiculated. Nectaries three, on their proper filaments.

Obſerv. Linnæus conſiders the ſpathe as the only calyx, and attributes ſix petals to the flower; three exterior, ſmall, reſembling a perianth, and three interior, very large, coloured.

** Two petals larger; one ſmall.*

Sp. 1. C. *communis*. Linn. Sp. Pl. 1. Mart. 1. Lam. 1. Encyc. 598. Ill. Willd. 1. Dill. Elth. tab. 78. fig. 89. Gært. tab. 15. fig. 1. Lam. Ill. tab. 35. fig. 1. Kooſcki. Kempf. Jap. 888. tab. 889. β. C. *polygama*; Roth. Catalect. Bot. 1. p. 1. "Leaves ovate-lanceolate, acute, ſtem creeping, ſmooth." *Root* annual. *Stems* ſeveral, two feet long, jointed, branched, leafy. *Leaves* alternate, nerved, ſupported by a membranous ſheath with ſhort hairs at its edge. *Flowers* axillary, two or three together, on ſhort peduncles; two of the petals blue, the third whitiſh green. *Capſule* egg-ſhaped, ſlightly compreſſed on each ſide, ſomewhat two-edged, two-celled, two-valved; valves thin, membranous, with the longitudinal partition on their inner ſide. *Seeds* two in each cell, affixed to the valves near the inſertion of the partition, two adhering to each valve, gibbous and pitted on one ſide, flat and furrowed, with a longitudinal line on the other, truncate at the end where they are oppoſite to each other, umbilicated. A native of North America, Africa, and Japan. β. differs only in having polygamous diandrous flowers. In all other reſpects it exactly correſponds with C. communis, of which it appears to be only a variety. Willd, 2. C. *africana*. Linn. Sp. Pl. 2. Mart. 2. Lam. 2. Ill. 599. Willd. 2. Gært. tab. 15. fig. 3. Lam. Ill. tab. 35. fig. 3. "Leaves lanceolate, ſmooth; ſtem decumbent." *Root* perennial. *Stems* about a foot long, branched, ſmooth. *Leaves* narrower, with ciliated or bearded ſheaths, and a ſmaller one within the other. *Flowers* with two petals; yellow, unguiculated and roundiſh, or kidney-ſhaped; the third ſmall, oval, ſeſſile, and of a pale colour. *Capſule* egg-ſhaped, two-valved, three-celled. *Seeds* in the upper cells, two, three, or four, roundiſh, ſmooth, umbilicated; but always barren and deſtitute of albumen; in the lower cell ſolitary, fertile, adnate to the valve on its whole length. A native of Africa. 3. C. *mollis.* Willd. 7. Lam. Ill. 600. Jacq. Collect. 3. 253. ic. rar. 293. "Leaves egg-ſhaped, petioled, villous; ſtem creeping." A native of South America. 4. C. *bengalenſis.* Linn. Sp. Pl. 3. Mart. 3. Lam. 3. Ill. 601. Willd. 3. (Ephemerum benghalenſe repens; Pluk. Alm. 135. tab. 27. fig. 3.) "Leaves egg-ſhaped, obtuſe; ſtem creeping." *Root* annual. *Stems* numerous, ſlightly villous, ſlender, branched. *Leaves* from an inch to an inch and half long, edged with very ſhort hairs, petioled above the ſheath; ſheath ciliated, marked with lines, ſpotted with purple. *Spathe* terminal, cowled, ſomewhat triangular, marked with lines. *Peduncles* within the ſpathe, two; one ſlender, longer, with a ſingle flower; the other thicker, channelled, bearing from two to four flowers, on jointed inflexed pedicels. *Petals* blue; ſmaller one paler. *Nectaries* yellow. A native of Bengal and Cochin-china. 5. C. *erecta.* Linn. Sp. Pl. 4. Mart. 4. Lam. 4. Ill. 602. Willd. 4. Dill. Elth. 91. tab. 77. fig. 88. "Leaves ovate-lanceolate; ſtem erect, ſcabrous, quite ſimple." *Root* perennial, fibrous. *Stems* a foot and half high, leafy. *Leaves* a little hirſute, but not hairy, except at the ſheath. *Flowers* pale blue; ſmaller petal very narrow, whitiſh and pellucid. *Capſules* roundiſh, obtuſely triangular, with three ſeeds. A native of Virginia.

** *Petals nearly equal.*

6. C. *virginica.* Linn. Sp. Pl. 5. Mart. 5. Lam. 5. Ill. 603. Willd. 5. (Ephemerum phalangoides; Pluk. Alm. 135. tab. 174. fig. 4.) "Leaves lanceolate, in ſhort petioles; bearded at the edge; ſtems erect." Nearly allied to the preceding, and perhaps, only a variety. *Root* perennial. *Stems* two feet high, ſimple, ſlightly villous. *Leaves* ſcabrous on the upper ſurface when rubbed from the baſe, pubeſcent underneath, narrowed near the ſheath. *Sheaths* nerved, ſomewhat pubeſcent, ciliated at the edge with reddiſh hairs. *Flowers* blue; the lower one on a ſhort pedicel; petals heart-ſhaped, quite entire. A native of Virginia. 7. C. *longicaulis.* Willd. 6. Jacq. ic. rar. 2. tab. 294. Collect. 3. p. 234. "Leaves linear-lanceolate, ſeſſile; ſheaths ciliated; ſtem decumbent." *Root* perennial. *Leaves* ſmoothiſh. *Pedicels* in pairs, filiform, jointed. A native of Caracas. 8. C. *hexandra.* Lam. 6. Ill. 604. Aubl. Guian. tab. 12. "Flowers hexandrous, in racemes." *Root* perennial. *Stems* three feet high or more, ſarmentous, climbing, bent at the joints. *Leaves* egg-ſhaped, acute, narrowed and petioled near the ſheath; ſheaths half an inch long, ciliated. *Flowers* blue; filaments ſhort and not villous, as in Tradeſcantia. 9. C. *tuberoſa.* Linn. Sp. 6. Mart. 6. Lam. 7. Ill. 605. Willd. 8. Dill. Elth. 94. tab. 79. fig. 90. Gært. tab. 15. fig. 2. Lam. tab. 35. fig. 2. "Leaves ſeſſile, ovate lanceolate, ſomewhat ciliated." *Root* perennial, conſiſting of ſeveral tubers ſomewhat like thoſe of ranunculus, or of common orpine (ſedum telephium), joining together at the top and forming a head, diminiſhing gradually downwards. *Stems* a foot high, weak, aſcending, branched at their baſe. *Leaves* villous underneath, ſmooth above; ſheath ſmooth, ſtriated, reddiſh, ſimply ciliated at the edge. *Flowers* blue, growing ſeveral together on ſlender peduncles. *Capſule* ovate-acuminate, ſomewhat depreſſed, two-valved, three-celled; upper valve, divided longitudinally into two cells; lower valve one-celled, a little concave above, convex below, cloſely adnate to the ſeed. *Seeds* in each of the upper cells two, tubercle wrinkled, ferruginous; in the lower cell, one, elliptical, ſmooth, lenticularly compreſſed, of a bay colour. Gært. A native of Mexico. 10. C. *barbata.* Lam. Ill. 606. "Leaves egg-ſhaped, ſeſſile; ſheaths bearded; ſtem creeping." A native of the iſland of Mauritius. 11. C. *longifolia.* Lam. Ill. 607. "Leaves lanceolate-linear; peduncles very long." A native of the iſland of Java. 12. C. *zanonia.* Linn. Sp. Pl. 7. Mart. 7. Lam. 8. Gært. tab. 15. fig. 4. Lam. Ill. tab. 35. fig. 4. (Zanonia; Plum. Gen. 38. Tradeſcantia zanonia; Willd. Swartz.) "Peduncles thickened; leaves lanceolate; ſheaths hairy at the edge; bractes in pairs." *Root* perennial. *Stem* about two feet high, cylindrical, jointed, ſmooth, branched towards the top. *Leaves* four or five inches long, about two broad, green and ſmooth above, ſlightly pubeſcent underneath when young, with purple-brown, or violet edges; ſheaths whitiſh-green, large. *Flowers* white; Lam. Sky-blue; Miller. *Fruit* berried, in an egg-ſhaped terminal raceme: berries falſe, dark-purple, formed of the corolla changed into a fleſhy ſucculent three-lobed ſubſtance which compleatly encloſes the capſule; capſule cylindric-egg-ſhaped, cruſtaceous, dotted in rows, teſtaceous, three-celled, opening at the tip into three parts. *Seeds* two, or one in each cell; in the cells which have two, angular, a little wrinkled, cinereous, with a ſmall pap on the ſide covering the embryo; in the cell which has only one, elliptical plano-convex, a little wrinkled about the edge, bearing the embryo on the middle of the back. Gært. A native of Cayenne, in South America. 13. C. *vaginata.* Linn. Mant. 177. Mart. 8. Lam. 9. Ill. 609. Willd. 9. "Leaves linear; flowers diandrous, ſheathed with an involucre." *Root* annual. *Stems* aſcending, numerous, ſomewhat ſcabrous. *Leaves* ſeſſile, acute. *Peduncles* terminal and axillary, elongated, ending in a ſtriated, lanceolate involucre, which is ſo convolute as to be almoſt cylindrical; calyx-leaves lanceolate, acute, coloured at the tip; petals oval, the length of the calyx; filaments of the nectary four, half the length of the ſtamens; nectaries linear; filaments of the ſtamens two, bearded, ſomewhat recurved, the length of the corolla; anthers yellow, marked with a black ſpot; ſtyle awl-ſhaped, ſomewhat recurved. Found by Koenig in the Eaſt Indies. 14. C. *nudiflora.* Linn. Mant. 177. Mart. 9. Lam. 10. Ill. 609. Willd. 10. "Peduncels capillary; leaves linear, without an involucre; flowers diandrous." *Root* annual. *Stem* about ſeven inches high, ſlender, nearly erect, decumbent at the baſe, ſomewhat ſcabrous. *Leaves* ſeſſile, acute; ſheath ſhort; edged with a few lax hairs. *Peduncles* for the moſt part terminal, from two to four together, accompanied by a very ſhort bracte. *Flowers* from four to ſix on each peduncle, naked, pedicelled; calyx-leaves ovate-lanceolate, acute, leſs than the corolla; petals three, egg-ſhaped, unequally diſtributed; the two lower ones moſt diſtant; filaments of the nectary three, half the length of the ſtamens, naked; nectaries deltoid; filaments of the ſtamens two, bearded, declining at the opening of the corolla; ſtyle declining. Found by Koenig in dry paſtures of the Eaſt Indies. 15. C. *cucullata.* Linn. Mant. 176. Mart. 11. Lam. 11. Ill. 611. Willd. 11. (C. nervoſa; Burm. ind. 18. tab. 7. fig. 3.) "Leaves egg-ſhaped; involucres cowled, turbinate." *Root* annual. *Stem* ſeven inches high, creeping at the baſe, and ſending out filiform roots. *Leaves* nerved, petioled; ſheaths wider than the ſtem; ciliated at the edge with diſtant, ſpreading, briſtle-ſhaped hairs; involucres terminal, truncated, many-flowered, entirely coaleſcent by the ſide. *Flowers* peduncled, minute. A native of the Eaſt Indies. 16. C. *japonica.* Thunb. in Linn. Tranſ. 2. 332. Mart. 12. Willd. 12. "Leaves ovate-lanceolate, undulated; ſtem erect, angular,

hairy; flowers panicled." *Stem* a foot high, furrowed, panicled at the top. *Leaves* alternate, ſheathing, acute, ſmooth; lower ones three inches long; upper ones about an inch. A native of Japan. 17. C. *ſpirata*. Linn. Mant. II. 176. Hort. Kew. 77. (C. bracteolata; Lam.?) "Leaves lanceolate: flowers panicled." Linn. "Leaves lanceolate-linear, undulated, ſomewhat curled; peduncles panicled, furniſhed with ſmall bractes, half-embracing the ſtem." Lam. *Root* annual. *Stem* creeping, aſcending, ſomewhat ſcabrous; Linn. *Stem* ſix or ſeven inches long, very ſlender, bent at the joints, almoſt ſmooth, leafy, branched; Lam. *Leaves* lanceolate, ſheathing, very minutely ſerrated; upper leaf cordate-lanceolate; ſheaths ciliated at the edge. Linn. *Leaves* narrow; ſheaths ſhort, ciliated; Lam. *Flowers* ſmall, bluiſh; Lam. *Panicle* terminal, divaricated, with ſmall ſheathing bractes; Linn. Lam. *Peduncles* capillary, compound; Lam. *Calyx* three-leaved; leaves ovate-lanceolate, concave; Lam. *Petals* three, equal, orbicular-egg-ſhaped; Linn. *Petals* three, egg-ſhaped, a little longer than the calyx. Lam. *Filaments* of the *ſtamens* three, bearded, naked above the middle. Linn. Almoſt entirely naked. Lam. *Filaments* of the *nectary* three, ſomewhat ciliated at the ſides. Corpuſcles cruciform, globular at the tips, whitiſh; Linn. corpuſcles yellow; Lam. *Style* and *ſtigma* ſpirally convolved, and evolved variouſly; Linn. *Style* permanent, a little ſpirally twiſted when the flower is paſt; Lam. Found by Koenig in moiſt ground, by the ſide of rivulets in the Eaſt Indies; communicated to La Marck from the Eaſt Indies by Sonnerat. La Marck ſeems to have no good reaſon to doubt the identity of his plant with that of Linnæus.

Obſ. It is evident from the above deſcriptions, that this genus, as it now ſtands, is a very anomalous one. C. hexandra, if it had bearded filaments, would unqueſtionably be a tradeſcantia. C. vaginata, nudiflora, and ſpirata, approach that genus, by their partially bearded filaments, but differ in the number of ſtamens; the firſt two have the additional anomaly of being diandrous, without a correſponding diminution in the number of the other parts. Linnæus, when he took up theſe three ſpecies, in his ſecond Mantiſſa, ſeems to have forgotten, or to have diſcarded, his original idea with reſpect to the flower; for he there attributes to it, not a ſix petalled corolla, but a three-petalled one, with a proper three-leaved calyx. Gærtner is of opinion that commelina and tradeſcantia are one truly natural genus.

COMMELINA *axillaris et criſtata*. Linn. See TRADESCANTIA.

Propagation and Culture. All the ſpecies are propagated by ſeeds. If the ſeeds of C. communis, which is an annual, be ſown upon a warm border of light earth in the autumn, they will come up early in the ſpring and ripen their fruit. The roots of C. africana ſend out offſets, by which the plant is eaſily propagated; but they will ſeldom live through the winter in the open air. The other ſpecies are tender, and muſt be ſown in a moderate hot-bed in the ſpring; tranſplanted to a freſh hot-bed, when they are two inches high; and in June, again tranſplanted into a warm border of light earth. C. tuberoſa may be preſerved, if planted in pots, and placed in the bark-ſtove in autumn: or its roots may be taken out of the ground in the autumn, kept in a warm place during the winter, and planted again in the ſpring; they will be more forward and ſtronger if placed on a hot-bed.

COMMEMORATION, the remembrance of any one; or ſomething done in honour of a perſon's memory.

Among the Romaniſts, it is a practice for dying perſons to leave a legacy to the church, for the rehearſing ſo many maſſes in commemoration of them.

The euchariſt is a commemoration of the ſufferings of Jeſus Chriſt.

COMMEMORATION is alſo the name of two religious feaſts, otherwiſe called *all-ſaints* and *all-ſouls*. The occaſion of their inſtitution is variouſly related. See the articles.

COMMEMORATION *of Handel*, in *Muſic*. In order to record an event ſo honourable to a liberal art, we ſhall draw our information from the hiſtory of that art, and from the account itſelf of the commemoration written expreſsly at the time, and publiſhed in 4to. by the ſame author, an attentive auditor of all the performances, whoſe ſenſations and memory were more freſh then than at the diſtance of 22 years.

In the "Hiſtory of Muſic," vol. iv. p. 518. it is ſaid, that "The year 1784 was rendered a memorable æra in the annals of muſic, by the ſplendid and magnificent manner in which the birth, genius, and abilities of Handel, were celebrated in Weſtminſter Abbey and the Pantheon, by five performances of pieces ſelected from his own works, and executed by a band of more than 500 voices and inſtruments in the preſence and under the immediate auſpices of their majeſties and the firſt perſonages in the kingdom. This event ſo honourable to the art of muſic and an illuſtrious artiſt, and ſo worthy of a place here, having been minutely recorded already in a diſtinct work, *viz.* "Account of them uſical performances in commemoration of Handel," by the author of this hiſtory, written and publiſhed for the benefit of the muſical fund; an eſtabliſhment which his majeſty having ſince deigned to honour with his patronage, the members and guardians have been permitted to incorporate themſelves under the title of Royal Society of Muſicians: We ſhall only add, that this celebration has been ſince eſtabliſhed into an annual muſical feſtival for the benefit of the fund, in which the number of performers, and perfection of the performances, as well as favour of the public, have continued to increaſe. In 1785, the vocal and inſtrumental band amounted to ſix hundred and ſixteen. In 1786, to ſeven hundred and forty-one; and in 1787, to eight hundred and ſix vocal and inſtrumental performers."

And in the ſame "Hiſtory of Muſic," at the end of the ſame vol. the author tells us, that "The commemoration of Handel, in 1784, having been crowned with a ſucceſs equally honourable to that great artiſt and to the nation, ſimilar performances have ſince been annually repeated, to ſtill more numerous audiences, for charitable purpoſes, in Weſtminſter-Abbey, under the title of a "Grand Muſical Feſtival." In 1787, the band of vocal and inſtrumental performers amounted to eight hundred and ſix muſicians, excluſive of the principal ſingers, conſiſting of twenty-two, with Madame Mara, Rubinelli, Harriſon, and Morelli at their head. And ſuch is the ſtate of practical muſic in this country, that the increaſe of performers, inſtead of producing confuſion, as might have been expected, has conſtantly been attended with ſuperior excellence of execution; as experience, the beſt of all teachers, has ſo guided the zeal of the directors, and the ſcience of the conductor and leader of this great enterprize, that a certain road to full perfection in every department ſeems to have been attained.

Though this celebration happened ſo recently, and is ſo well known as ſcarcely to need being mentioned here for the information of the preſent race, among muſical articles; yet as our plan extends to hiſtory and biography, as well as definitions and ſcientific explanations, a record of a muſical event of ſuch magnitude ſeems neceſſary for the information of diſtant times, if we may dare hope to reach them. The origin and progreſs of the plan, as related in the introduction to the printed narrative, dedicated by permiſſion to the king, is the following.

" It was in the year 1783, that the idea of this great enterprize was conceived in a converſation between lord viſcount Fitzwilliam, the late ſir Watkin Williams, and Joah Bates, late commiſſioner of the victualling office, on obſerving how much more London abounded with great muſicians, vocal and inſtrumental, foreigners and natives, than any other city in Europe: but ſo diſunited and diſperſed at the operas, oratorios, theatres, and public and private concerts, that they can never be heard in the aggregate, nor can the effects which may be produced by ſuch a united band as our capital could furniſh, ever be known, unleſs ſome plan was formed of a public periodical occaſion for collecting and conſolidating them into one band; by which means a performance might be exhibited on ſo grand and magnificent a ſcale as no other part of the world could equal. The birth and death of Handel naturally occurred to three ſuch enthuſiaſtic admirers of that great maſter, and it was immediately recollected, that the next (now the preſent) year, would be a proper time for the introduction of ſuch a cuſtom: as it formed a complete century ſince his birth, and an exact quarter of a century ſince his deceaſe.

The plan was ſoon after communicated to the governors of the Muſical Fund, who approved it, and promiſed thier aſſiſtance. It was next ſubmitted to the directors of the concert of Ancient Muſic, who, with an alacrity which does honour to their zeal for the memory of the great artiſt Handel, voluntarily undertook the trouble of managing and directing the celebrity. At length, the deſign coming to the knowledge of the king, it was honoured with his majeſty's ſanction and patronage. Weſtminſter Abbey, where the bones of the great muſician were depoſited, was thought the propereſt place for the performance; and application having been made to the biſhop of Rocheſter for the uſe of it, his lordſhip, finding that the ſcheme was honoured with the patronage of his majeſty, readily conſented; only requeſting, as the performance would interfere with the annual benefit for the Weſtminſter Infirmary, that part of the profits might be appropriated to that charity as an indemnification for the loſs it would ſuſtain. To this the projectors of the plan acceded; and it was afterwards ſettled, that the profits of the firſt day's performance ſhould be equally divided between the muſical fund and the Weſtminſter Infirmary; and thoſe of the ſubſequent days be ſolely applied to the uſe of that fund which Handel himſelf ſo long helped to ſuſtain, and to which he not only bequeathed a 1000*l.*, but which almoſt every muſician in the capital annually contributes his money, his performance, or both, to ſupport.

Impreſſed with a reverence for the memory of Handel, no ſooner was the project known, but moſt of the practical muſicians in the kingdom eagerly manifeſted their zeal for the enterpriſe; and many of the moſt eminent profeſſors, waving all claims to precedence in the band, offered to perform in any ſubordinate ſtation, in which their talents could be moſt uſeful."

" By the latter end of February, the plan and neceſſary arrangement were ſo far digeſted and advanced, that the directors ventured to inſert in all the newſpapers, the following advertiſement.

Under the Patronage of His Majeſty,
In Commemoration of Handel, who was buried in
Weſtminſter Abbey, on the 21ſt of April, 1759.

On Wedneſday the 21ſt of April next, will be performed in Weſtminſter Abbey, under the management of the

Earl of Exeter
Earl of Sandwich
Viſcount Dudley Ward
Viſcount Fitzwilliam
Lord Paget
Right Hon. H. Morrice
Sir W. Williams Wynn, Bart.
Sir Richard Jebb, Bart.

Directors of the concert of Ancient Muſic;

Some of the moſt approved pieces of ſacred muſic, of that great compoſer.

The doors will be opened at 9 o'clock, and the performance will begin preciſely at twelve.

And on the evening of the ſame day, will be performed, at the Pantheon, a grand miſcellaneous concert of vocal and inſtrumental muſic; conſiſting entirely of pieces ſelected from the works of Handel.

The doors will be opened at 6 o'clock, and the concert will begin exactly at eight.

And on Saturday morning, April 24th, will be performed, in Weſtminſter Abbey, the ſacred oratorio of the Meſſiah.

Such is the reverence for this illuſtrious maſter, that moſt of the performers in London, and a great many from different parts of the kingdom, have generouſly offered their aſſiſtance; and the orcheſtra will conſiſt of at leaſt 400 performers, a more numerous band than was ever known to be collected in any country, or on any occaſion whatever. The profits ariſing from the performances, will be applied to charitable purpoſes.

In order to render the band as powerful and complete as poſſible, the trombone, ſacbut, or double curtle, and double kettle drums, were ſought and their uſe revived.

In preparing Weſtminſter Abbey for the reception of their majeſties and the royal family, as well as the archbiſhops and biſhops, judges, great officers of ſtate, and principal nobility and gentry in the kingdom, to the amount of three or four thouſand, Mr. James Wyatt, the admirable architect of the ill-fated Pantheon, furniſhed the elegant drawings for the orcheſtra, throne, and galleries.

As this commemoration is not only the firſt inſtance of a band of ſuch magnitude being aſſembled together, but of any band, at all numerous, performing in a ſimilar ſituation, without the aſſiſtance of a manu-ductor, to regulate the meaſure, the performances in Weſtminſter Abbey may be ſafely pronounced, no leſs remarkable for the multiplicity of voices and inſtruments employed, than for accuracy and preciſion. When all the wheels of that huge machine, the orcheſtra, were in motion, the effect reſembled clock-work in every thing, but want of feeling and expreſſion.

And, as the power of gravity and attraction in bodies are proportioned to their maſs and denſity, ſo it ſeems as if the magnitude of this band had commanded and impelled adheſion and obedience, beyond that of any other of inferior force. The pulſations in every limb, and ramifications of veins and arteries in an animal, could not be more reciprocal, iſochronous, and under the regulation of the heart, than the members of this body of muſicians under that of the conductor and leader. The totality of ſound ſeemed to proceed from one voice, and one inſtrument; and its powers produced, not only new and exquiſite ſenſations in judges, and lovers of the art, but were felt by thoſe who never received pleaſure from muſic before.

This celebration was at firſt deſigned to be extended to no more than two performances on the ſame day: one at noon in Weſtminſter Abbey, for ſacred muſic; and the other in the evening of the ſame day at the Pantheon, for ſecular compoſitions, ſelected from the operas and miſcellaneous works of the hero whoſe apotheoſis was the efficient cauſe of this extraordinary undertaking. But being countenanced by his majeſty, the directors of the concert of ancient muſic, the governors of the muſical fund, and eagerly patronized by the public in general, while the plan was digeſting, it determined the projectors, at the inſtigation of his majeſty, to have three performances. The firſt and third in the morning, at Weſtminſter Abbey, and the ſecond at the Pantheon.

Theſe performances having given ſuch entire ſatisfaction to all that were preſent, and becoming, of courſe, the general ſubject of diſcuſſion and praiſe, excited a great deſire in all lovers of muſic, and even of ſplendid ſpectacles, who were abſent, to be enabled to judge and ſpeak of tranſactions ſo memorable, from the conviction of their own ſenſes. But even theſe were not more eager in wiſhing there might be a repetition of the performances, than thoſe who had already attended them. Luckily for all parties, the wiſhes of their majeſties coincided with thoſe of their ſubjects; and as the ſcaffolding was ſtill ſtanding, and the band not yet diſperſed, two more opportunities were given for the diſplay of Handel's wonderful powers, and the gratification of public curioſity.

The fourth day was ſupplied with a well choſen ſelection of Handel's moſt grand and captivating compoſitions, from his oratorios and anthems; and on the fifth, that ſublime production, the Meſſiah, was repeated; and though it had been performed in the Abbey but a week before, in ſo perfect and magnificent a manner, that no rehearſal, previous to its repetition, was neceſſary to the band; yet, to gratify the wiſhes of many timid and infirm lovers of muſic, who dreaded the croud that was likely to be aſſembled at a public performance, as well as to raiſe money for charitable purpoſes, another rehearſal would certainly have been announced, if it had not been prevented from taking place by the celebration of his majeſty's birth-day, on which occaſion there was a certainty that the chief part of the performers and company would be engaged.

Thoſe who attended this day's commemoration at the Abbey were, ſeemingly, of a higher claſs than had yet appeared there; ſo that though the croud was ſomewhat leſs than at the preceding performance of the ſame oratorio, the exhibition was more ſplendid. Indeed, as a ſpectacle, it was ſo magnificent to the ſight, and, as a muſical performance, ſo mellifluous and grateful to the ear, that it will be difficult for the *mind's eye* of thoſe who were abſent, to form an adequate idea of the ſhow, or the *mental ear* of the ſound, from deſcription. Every one preſent muſt have found full employment for the two ſenſes which afford us the moſt refined pleaſure; as it is from the eye and the ear that intellect is fed, and the mind furniſhed with its beſt intelligence.

At the firſt performance of the Meſſiah, his majeſty expreſſed a deſire to the earl of Sandwich of hearing the moſt truly ſublime of all choruſſes, "Allelujah! for the Lord God omnipotent reigneth," a ſecond time; and this gracious wiſh was conveyed to the orcheſtra, by the waving of his lordſhip's wand. At this ſecond performance of that matchleſs oratorio, his majeſty was pleaſed to make the ſignal himſelf, with a gentle motion of his right hand, in which was the printed book of the words, not only for the repetition of this, but of the final chorus, in the laſt part, to the great gratification of all his happy ſubjects preſent; and, perhaps, the ſubjects of no ſovereign prince on the globe were ever before ſo delighted with the effects of a royal mandate.

Thus ended the fifth and laſt of the performances for this memorable celebration; and ſo great and perfect was the pleaſure which the audience had received, that thoſe who had attended all the five exhibitions ſeemed moſt to regret this final cloſe.

The whole receipts at the five performances of this moſt ſplendid and magnificent celebration amounted to 12,736*l.* 12*s.* 10*d.* Of which, after all diſburſements for building, band, and other incidental expences, to the amount of 5736*l.* 12*s.* 10*d.*, 6000*l.* remained for the fund of the ſociety of decayed muſicians, and 1000*l.* for the Weſtminſter hoſpital.

At the end of the printed account of the firſt year's *Commemoration of Handel*, is added in the Appendix, a "Hiſtory of the Riſe and Progreſs of the Fund for the Support of decayed Muſicians and their Families, eſtabliſhed in 1738," which has been ſince laudably imitated by other profeſſions, and in other countries; and it appeared in 1784, after theſe performances, that by the great acceſſion to the fund from the commemoration, its capital became a ſerious and weighty concern, amounting to upwards of 22,000*l.*, in South-ſea annuities and three per cents.; which realizes and aſcertains an income of 678*l.* a year, excluſive of benefits or ſubſcription.

The path therefore which the governors and court of aſſiſtants have now to purſue, is perfectly plain and pleaſant; the power of alleviating diſtreſs and miſery, of feeding the hungry, clothing the naked, and adminiſtering comfort to age and infirmities, is placed in their hands, without the trouble of providing the means.

COMMENASA, in *Ancient Geography*, a river of Aſia, according to Arrian, who ſays that it ran into the Indus.

COMMENDAM, in the *Canon Law*, expreſſes the charge, truſt, and adminiſtration of the revenues of a benefice, given to a layman to enjoy, by way of depoſitum, for the ſpace of ſix months, in order to its being repaired, &c. or to another biſhop, or eccleſiaſtic, to perform the paſtoral offices thereof, till ſuch time as the benefice is provided of a regular incumbent. See BENEFICE.

Anciently, the adminiſtration of vacant biſhoprics belonged to the neareſt neighbouring biſhop; which continued to be practiſed between the archbiſhopric of Lyons, and the biſhopric of Autun: on this account they were called *commendatory biſhops*.

This cuſtom appears to be very ancient: St. Athanaſius ſays of himſelf, according to Nicephorus, that there had been given him in *commendam*, i. e. in adminiſtration, another church beſides that of Alexandria, whereof he was ſtated biſhop.

The care of churches, it ſeems, which had no paſtor, was committed to a biſhop, till they were provided with an ordinary: the regiſter of pope Gregory I. is full of theſe commiſſions, or commendams, granted during the abſence or ſickneſs of a biſhop, or the vacancy of a ſee. Some ſay, that pope Leo IV. firſt ſet the modern commendams on foot, in favour of eccleſiaſtics who had been expelled their benefices by the Saracens; to whom the adminiſtration of the vacant churches was committed for a time, in expectation of their being reſtored: though St. Gregory is ſaid alſo to have uſed the ſame, while the Lombards deſolated Italy.

In a little time, the practice of commendams became exceedingly abuſed; and the revenues of monaſteries were given to laymen for their ſubſiſtence. The biſhops alſo procured ſeveral benefices, or even biſhoprics, in commendam, which ſerved for a pretext for holding them all without directly violating the canons. Part of the abuſe has been retrenched; but the uſe of commendams is ſtill retained, as an expedient to take off the incompatibility of the perſon, by the nature of the benefice.

When a parſon is made biſhop, his parſonage becomes vacant; but if the king by ſpecial diſpenſation give him power to retain his benefice, notwithſtanding his promotion, he ſhall continue parſon, and is ſaid to hold it *in commendam;* but this muſt be done before conſecration, for afterwards it comes too late, becauſe the benefice is then abſolutely void. There are ſeveral ſorts of commendams founded on the ſtat. 25 Hen. VIII. cap. 21. as a *commendam ſemeſtris,* which is for the benefit of the church, without any regard to the commendatary, being only a proviſional act of the ordinary, for ſupplying the vacation of 6 months, in which time the patron is to preſent his clerk, and only implies a ſequeſtration of the cure and fruits till the clerk is preſented: *commendam retinere,* by means of which a biſhop retains benefices on his preferment, which has operated for a certain number of years, or even as long as the *commendatary* lived, and continued biſhop; and theſe commendams are granted on the king's mandate to the archbiſhop, expreſſing his conſent, which continues the incumbency, ſo that there is no occaſion for inſtitution: a *commendam recipere,* which is to take a benefice *de novo,* in the biſhop's own gift, or of ſome other patron, whoſe conſent is obtained; and for life, when it is equal to a preſentation, without inſtitution, or induction. But all diſpenſations beyond 6 months were only permiſſive at firſt, and granted to perſons of merit; the *commendam retinere* is for one or two years, &c. and ſometimes for three or ſix years, and doth not alter the eſtate which the incumbent had before; and this, as long as the commendatary ſhould live and continue biſhop, hath been thought good. Vaugh. 18. The *commendam recipere* muſt be for life, as other parſons and vicars enjoy their benefices; and as a patron cannot preſent to a full church, ſo neither can a *commendam recipere* be made to a church that is then full. Show. 414.

A benefice cannot be *commended* by parts, any more than it may be preſented unto by parts; ſo that one ſhall have the glebe, another the tythes, &c. Nor can a commendatary have a *juris utrum,* or take to him and his ſucceſſors, ſue or be ſued, in a writ of annuity, &c. But a *commenda perpetua* may be admitted to do it. 11 Hen. IV. Compl. Incumb. 360. (See Nelſ. Abr. 454.)

Theſe commendams are now in fact ſeldom or never granted to any but biſhops; and in that caſe the biſhop is made commendatary of the benefice while he continues biſhop of ſuch a dioceſe, as the object is to make an addition to a ſmall biſhopric; and it would be unreaſonable to grant it to a biſhop for life, who might afterwards be tranſlated to one of the vacant ſees.

COMMENDAM, in popiſh countries, is a real title of a regular benefice; as an abbey, or priory given by the pope to a ſecular clerk, or even to a layman, with power to diſpoſe of the fruits thereof during his life.

No benefice that has a cure of ſouls, i. e. no parſonage, or biſhopric, can be given *in commendam.* This practice being entirely contrary to the canons, none but the pope, who has a power of diſpenſing with the canons, can confer it.

When the commendam becomes vacant by the death of the *commendatary,* it is not eſteemed vacant by his death; but as it was before the commendam was granted: that making no alteration in the thing: yet the pope gives the ſame benefice in commendam again, by a privilege which he ſtill continues.

By the pope's bulls, a *commendatary* abbot has the full authority of the regular abbot to whom he is ſubſtituted. For this reaſon, the bulls expreſsly require, that he be a prieſt; or, that if he have not yet attained the age of prieſthood, he ſhall take orders as ſoon as he has. But this is a mere formality, or matter of ſtyle, the thing is never executed.

Indeed, the ſpiritual direction of the abbey, while it is *in commendam,* is lodged wholly in the clauſtral priors.

The commendatary abbots have not any authority over the religious *in ſpiritualibus:* they even cannot either appoint or ſet aſide the clauſtral priors, who are nominated in the bulls the adminiſtrators of the ſpiritualities; in which, however, this reſtriction is added, viz. till the abbot arrive at the age of twenty-five years, to aſſume the prieſthood.

The popes grant benefices *in commendam,* not only to clerks, by diſpenſing with their age, and other qualifications required; but they alſo diſpenſe with the clericate even in children yet in the cradle, till they become of age to take the tonſure: it being ſufficient to obtain a bull, that it be repreſented at Rome, that the child is deſtined for the eccleſiaſtic ſtate. In this caſe there is an OECONOMUS, or ſteward, appointed to take care of the temporal concerns.

COMMENDATARY, a perſon who holds a church living or preferment *in commendam.*

COMMENDATARY *Letters,* are ſuch as are written by one biſhop to another in behalf of any of the clergy, or others of his dioceſe travelling thither; that they may be received among the faithful; or that the clerk may be promoted; or neceſſaries may be adminiſtered to others, &c. Several forms of theſe letters may be ſeen in our hiſtorians; as in Bede, lib. ii. cap. 18.

COMMENDATUS, one that lives under the protection of a great man.

Commendati homines were perſons who, by a voluntary homage, put themſelves under the protection of any ſuperior lord; for ancient homage was either predial, due for ſome tenure, or perſonal, which was by compulſion, as a ſign of neceſſary ſubjection; or voluntary, with a deſire of protection. And thoſe who by voluntary homage put themſelves under the protection of any men of power, were ſometimes called *homines ejus commendati,* ſometimes only *commendati,* as often occurs in Domeſday. *Commendati dimidii* were thoſe who depended on two ſeveral lords, and paid one half of their homage to each; and *ſub-commendati,* were like under-tenants, under the command of perſons who were dependants themſelves on a ſuperior lord. There were alſo *dimidii ſub-commendati,* who bore a double relation to ſuch depending lords. Domeſday. This phraſe ſeems to be ſtill in uſe, in the uſual compliment, *commend* me to ſuch a friend, &c. which is to let him know I am his humble ſervant. Spelm. of Feuds, cap. 20.

COMMENDO, called alſo *Commani, Kommani, Agueſto,* and *Guaffo,* in *Geography,* a kingdom of Africa, on the Gold coaſt, bordered on the weſt by the countries of Jabi and Jaben, on the north-weſt by Adom, by Ambrambo on the north; on the eaſt, by a little republic lying between Commendo and Fetu, called Addena, or Elmina; and by the ocean on the ſouth. The dimenſions are about five miles along the ſea-coaſt, and about as many up the country. In the centre, on the ſtrand, ſtands Little Commendo, or Commani, called by the negroes Ekki Tekki, having cape Aldea das Terras on the weſt, and Ampani on the eaſt, with ſome ſmall hamlets in the intermediate ſpaces. Commendo had formerly been a part of Saba and Fetu, but of late years it has been erected into a ſeparate monarchy. The chief city, or reſidence of the king, is called "Guaffo," which is large and well inhabited, containing no leſs than 400 houſes, and ſituated on high ground, at the diſtance of four miles from

Little Commendo; the Dutch diſtinguiſh both by the name of Great and Little Commendo. This kingdom produces but little rice; nevertheleſs, the vallies are no leſs fertile than agreeable, and the hills covered with wood, which affords a very delightful proſpect. Behind Little Commendo, the land riſes by a gentle aſcent into little hills, beautifully ſheltered with woods of a perpetual verdure; and at the bottom are meadows and plains diſpoſed in the moſt agreeable manner, and abounding with various kinds of fruit-trees. The natives are warlike, and ſo numerous, that in this little kingdom, the ſovereign is able to raiſe an army of 20,000 men. His ordinary body-guard is compoſed of 500 ſtout fellows, well armed, reſolute, and loyal. It has been ſaid that Commendo abounds in gold mines, but that the king, for fear of exciting the avarice of the Europeans, prohibits the working of them. This country is divided into two diſtinct provinces. We ſhall content ourſelves with deſcribing Little Commendo. This province is called by the Portugueſe Aldea das Terras, and by the natives Ekki Tekki. The town is ſaid to contain at leaſt 100 houſes. It is ſituated on the banks of a fine rivulet, that empties itſelf into the ſea on the ſouthward, which forms a kind of canal, or little oblong harbour for canoes. The N.E. ſide of the town, where the French had formerly a ſettlement, is bordered by little hills, at the foot of which lie fine rich meadows and paſture, as well as fertile fields, every where interſperſed with groves of fruit-trees. Little Commendo, which was once a place of great note, and one of the fineſt towns in Guinea, has ſince exhibited only the remains of a town deſtroyed by fire, and the well peopled ruins of a once flouriſhing and great city. The natives of Little Commendo are in general turbulent, cunning, and deceitful; much addicted to lying and ſtealing. Their employment conſiſts either in fiſhing or in commerce, and their neighbours employ them as brokers and factors, particularly the people of Akamen, who carry on a conſiderable trade. Every morning 70 or 80 large canoes may be ſeen upon the coaſt fiſhing, or trading with the European ſhipping in the road. About the middle of the day they put to ſhore when the ſouth-weſt winds begin to blow, both for facility of unloading, and for ſecuring a market for their cargoes, either at Great or Little Commendo, where the inland negroes aſſemble with the commodities of their principal countries. No markets on earth are better ſupplied with all ſorts of grain, roots, fruits, pulſe, and fiſh, than theſe, nor at a more reaſonable price. Here the Engliſh and Dutch have forts. Next to Cape Coaſt, the Engliſh fort is ſaid to be the principal which they poſſeſs in Guinea, at leaſt on the Gold Coaſt. The Dutch fort of Wodenbourgh, lies at the diſtance of a muſket ſhot, and was built in the year 1688. N. lat. 4° 54′. E. long. 0° 34′.

The principal commodities for which there is a demand by the negroes of Commendo, are glaſs beads, braſs bells, and buttons, long linen cloths and woollen ſtuffs. They are very dextrous in the adulteration of gold, and the practice is very common. When the people of Commendo are at war, they have uſually a ſlave-market at Little Commendo, for the more quick diſpatch of their buſineſs. Here alſo they keep quantities of gold in the hands of certain agents employed to carry on trade, while the reſt are fighting the enemy in the field. The gold trade, however, is not very conſiderable.

COMMENDONE, Gianfrancesco, in *Biography*, an eminent prelate in the church of Rome, was born at Venice in 1524, and began, at the early age of ten years, to compoſe verſes. He purſued his ſtudies at Padua, and in the year 1550, he was introduced to pope Julius III., by whom he was made chamberlain, and afterwards employed on public buſineſs. In 1553, he accompanied the legate cardinal Bandino to Flanders, and from thence he was diſpatched ſecretly to England, to enquire into the ſtate of religion under queen Mary. Paul IV. made him biſhop of Zant, and commiſſioned him to excite the different ſtates of Italy to unite with him in a common league. By Pius IV. he was raiſed to the office of cardinal in 1565, while he was nuncio in Poland. He was employed in various other miſſions to foreign ſtates, and in all theſe he acted with zeal for his church, and executed whatever was committed to his charge with the utmoſt diſpatch and fidelity. Under Gregory XIII. he was proſecuted by the imperial faction for having too great a partiality towards France; his own party was, however, ſo ſtrong, that he was not only acquitted, but upon a dangerous illneſs of the pope, it was projected to raiſe him to the papal crown. The pope, by recovering his health, diſappointed his expectations, and Commendone himſelf died at Padua, in December, 1584. He is not celebrated as an author, having left behind him only ſome Latin poems, among thoſe of the Academy of Occulti, of which he was the zealous patron, and ſome letters inſerted in the notes to thoſe of Julio Poggiano. Commendone was reckoned one of the ableſt politicians of his own time, a man of great learning, and a friend to literature. He cultivated an intimate friendſhip with many of the moſt eminent ſcholars in Italy, and to him were addreſſed ſome letters of Annibal Caro. Gen. Biog.

Commensurable *Quantities*, in *Geometry*, are ſuch as have ſome common aliquot part, or which may be meaſured or divided without leaving a remainder, by ſome meaſure or diviſor, called their common meaſure. Thus, a foot and a yard are commenſurable; there being a third quantity which will meaſure each, viz. an inch; which taken 12 times makes a foot, and 36 times a yard.

Commenſurables are to each other as one rational whole number to another. In incommenſurables it is otherwiſe. The ratio of commenſurables, therefore, is rational; that of incommenſurables irrational: hence, alſo, the exponent of the ratio of commenſurables is a rational number.

Commensurable *Numbers*, in *Arithmetic*, whether integers or fractions, are ſuch as have ſome other number which will meaſure or divide them without any remainder. Thus, 6 and 8, both divided by 2, are reſpectively commenſurable numbers: $\frac{2}{3}$ and $\frac{3}{4}$, or $\frac{8}{12}$ and $\frac{9}{12}$, are commenſurable fractions, becauſe the fraction $\frac{1}{6}$ or $\frac{1}{12}$ will meaſure them both; and in this ſenſe all fractions may be ſaid to be commenſurable.

Commensurable *in Power*. Right lines are ſaid to be commenſurable in power, when their ſquares are meaſured by one and the ſame ſpace, or ſuperficies.

Commensurable *Surds*, are ſuch ſurds as, being reduced to their leaſt terms, become true figurative quantities of their kind; and are therefore as a rational quantity to a rational: ſuch are $3\sqrt{2}$ and $2\sqrt{2}$ being one to the other as 3 to 2. See Surd.

COMMENTACULA, among the Romans, the rod which the flamens carried in their hands when going to ſacrifice.

COMMENTARIENSIS, in *Ancient Military Language*, the perſon who was gaoler of the ſoldiers' priſon among the Romans, and kept its regiſters. He was ſubject to the "triumviri capitales."

COMMENTARY, or Comment, a gloſs, or interpretation, affixed to ſome ancient, obſcure, or difficult author, to render him more intelligible, or to ſupply what he has left undone. The biblical ſtudent may find ſome judicious and uſeful remarks on *commentators*, or thoſe who have written commentaries on the Sacred Scripture, in Mr. Locke's Preface

face to his Paraphraſe and Notes on the Epiſtles of St. Paul.

COMMENTARY is alſo uſed for a ſort of hiſtory, written by a perſon who had a chief hand in the tranſactions related.

Such are the commentaries of Cæſar, of Sleidan, Montluc, &c.

The word is alſo uſed for certain books written on ſome particular ſubject: Kepler has an excellent book of commentaries on Mars, containing obſervations on the motion of that planet.

COMMEQUIERS, in *Geography*, a town of France, in the department of the Vendée, 15 miles N. of Sables d'Olonne.

COMMERAGH, or CUMMERAGH, the name of a high ridge of mountains which lie between Dungarvan and Clonmell, in the county of Waterford, Ireland. On the ſides of this chain, ſays Dr. Smith, are many horrid precipices and ſteep declivities, and the vallies are full of large fragments intermixed with ſand and gravel. On the tops of moſt of them are alſo large heaps of ſtones. Smith's Waterford.

COMMERCE, the interchange of commodities, or the diſpoſal of produce of any kind for other articles, or for ſome repreſentative of value for which other articles can be procured, with the view of making a profit by the tranſaction. The term is uſually reſtricted to the mercantile intercourſe between different countries; the internal dealings between individuals of the ſame country, either for the ſupply of immediate conſumption, or for carrying on manufactures, being more commonly denominated *trade*.

The mutual convenience of an exchange of commodities, muſt have been evident almoſt as ſoon as any part of mankind had acquired an idea of diſtinct property; the difficulty of communication between different countries muſt, however, have long rendered commercial intercourſe very limited and uncertain. The dangers attending long journies induced thoſe who engaged in trading to diſtant parts, to aſſociate together for mutual aſſiſtance and defence; and theſe companies of merchants, or caravans, were well adapted for the improvement of commerce, from the information which the individuals compoſing them would communicate to each other, and the connections they might occaſionally form. In the book of Geneſis, mention is made of the companies or caravans of Iſhmaelite merchants trading in ſpices from Gilead into Egypt; to one of whom Joſeph was ſold, about 620 years after the flood. But this mode of communication between different countries was inſufficient for the enterpriſing ſpirit of commercial adventurers; remote countries cannot convey their commodities by land to thoſe places where, on account of their rarity, they are moſt deſired, and conſequently become moſt valuable. It was not till ſome progreſs had been made in the art of navigation, that the power was acquired of tranſporting with facility the ſuperfluous ſtock of one part of the earth to ſupply the wants of another part, and that the active ſpirit of commerce could extend its multifarious concerns to all the known parts of the globe.

The Egyptians, ſoon after the eſtabliſhment of their monarchy, are ſaid to have opened a trade between the Arabian Gulph or Red Sea, and the weſtern coaſt of the great Indian continent. The commodities which they imported from the eaſt, were carried by land from the Arabian Gulph to the banks of the Nile, and conveyed down that river to the Mediterranean: but the maxims and manners of Egypt were inimical to commerce, and this profitable traffick ſoon declined.

The ſituation and circumſtances of the Phenicians naturally led them to look to commerce as the only ſource from which they could derive opulence or power; and accordingly, the foreign trade carried on by them, particularly from Sidon and Tyre, became more extenſive and important than that of any ſtate in the ancient world. Their ſhips not only frequented all the ports in the Mediterranean, but they were the firſt who ventured beyond the ancient boundaries of navigation, and paſſing the ſtreights of Gibraltar, viſited the weſtern coaſts of Spain and Africa. They revived a commercial intercourſe with Arabia and the continent of India, on the one hand, and with the eaſtern coaſt of Africa on the other; the cargoes which they purchaſed in Arabia, Ethiopia, and India, being landed at Elath, the ſafeſt harbour in the Red Sea towards the north: thence they were carried by land to Rhinocolura, the diſtance not being very conſiderable, and, being re-ſhipped in that port, were tranſported to Tyre, and diſtributed over the world.

The wealth which the Phenicians acquired by monopolizing the commerce of the Red Sea, incited their neighbours, the Jews, under the proſperous reigns of David and Solomon, to aim at being admitted to ſome ſhare of it. Solomon fitted out fleets, which, navigated by Phenician pilots and mariners, ſailed from the Red Sea to Tarſhiſh and Ophir, from whence they brought ſuch valuable cargoes as ſuddenly diffuſed wealth and ſplendour through the kingdom of Iſrael. But the inſtitutions of the Jews were by no means favourable to commerce, which was never carried to any great extent by them while they inhabited Judea.

The Carthaginians applied themſelves to commerce and navigation with ardour, ingenuity, and ſucceſs; but as the Phenicians had engroſſed the commerce of India, their adventures were chiefly made to the weſt and north. Following the courſe which the Phenicians had opened, they extended their voyages beyond the ſhores of the Mediterranean, viſiting not only all the coaſts of Spain, but thoſe of Gaul, and penetrating at laſt to Britain. They made voyages of diſcovery in different directions, and thus eſtabliſhed a commercial intercourſe with places which before were wholly unknown; but whatever knowledge of this kind they acquired, it was concealed from the inhabitants of other ſtates with the utmoſt care.

The Greeks, although their country was almoſt encompaſſed by the ſea, which formed many ſpacious bays and commodious harbours, and though it was ſurrounded by a number of fertile iſlands, were, notwithſtanding ſuch a favourable ſituation, a long time before they attained any degree of perfection in navigation. They ſcarcely carried on any commerce beyond the limits of the Mediterranean. Their chief intercourſe was with the colonies of their countrymen planted in the leſſer Aſia, in Italy, and in Sicily. They ſometimes viſited the ports of Egypt, of the ſouthern provinces of Gaul, and of Thrace, or paſſing through the Helleſpont, they traded with the countries ſituated around the Euxine ſea. The expedition of Alexander into the eaſt conſiderably enlarged the geographical knowledge of the Greeks. He had obſerved the reſources which commerce creates, in the exertions of the republic of Tyre, and therefore it became part of his plan to render the empire which he propoſed to eſtabliſh, the centre of commerce as well as the ſeat of dominion. With this view, he founded Alexandria near one of the mouths of the Nile, that, by the Mediterranean ſea, and the neighbourhood of the Arabian gulph, it might command the trade both of the eaſt and weſt. This ſituation was ſo judiciouſly choſen, that Alexandria ſoon became the chief commercial city in the world. Not only during the ſubſiſtence of the Grecian empire in Egypt and in the eaſt, but amidſt all the ſucceeding revolutions of thoſe countries, commerce, particularly that of the Eaſt Indies, continued to flow in the channel which the ſagacity and foreſight of Alexander had marked out for it, till the diſcovery of the navigation by the Cape of Good Hope opened a more expeditious and independent channel to all the maritime ſtates of Europe.

In the early periods of the Roman hiſtory, commerce appears to have been much neglected and undervalued; it ſeems to have been thought a degrading employ by this military people, and to have been left almoſt entirely in the hands of the natives of the countries they conquered. The extent, however, of the Roman power, which included the greateſt part of the known world, the vigilant inſpection of the Roman magiſtrates, and the ſpirit of the Roman government, no leſs intelligent than active, gave ſuch additional ſecurity to commerce, as animated it with new vigour; and, as ſoon as the Romans acquired a taſte for the productions of other countries, commerce, particularly the trade with India through Egypt, was puſhed with new vigour, and carried on to a greater extent. The pilots who ſailed from Egypt to India firſt ventured to quit ſight of the ſhore, and depending wholly on the trade winds, boldly ſailed from Ocelis at the mouth of the Arabian gulph, acroſs the ocean, to the coaſt of Malabar, returning with the eaſtern monſoon, and thus procuring the ſpices and other rich commodities of the continent and iſlands of the farther India, which were brought to the port of Muſiris by the Indians themſelves. The commerce thus carried on will appear conſiderable even in the preſent age, as the trade with India is ſaid to have drained the Roman empire every year of more than four hundred thouſand pounds, and that one hundred and twenty ſhips ſailed annually from the Arabian gulph to that country. The reign of Auguſtus was very favourable to commerce, as the peace which then prevailed over the civilized parts of the world, enabled the merchants to purſue it unmoleſted. Under Tiberius we find the Romans extending their protection to the north, and the town of Havern, the moſt ancient in Frieſland, founded. Under Nero, the capital of England is firſt mentioned as a conſiderable place. Tacitus, who lived for ſome time at London, ſays it was famous for its many merchants, and plenty of its merchandize. Rome, however, as the ſeat of wealth and luxury, continued to be the metropolis of the commercial world, until the fourth century, when Conſtantine removed the ſeat of empire to Conſtantinople, and made it the emporium of commerce. This city was undoubtedly well adapted for that honour; it was favoured by nature with a fine climate, and in a moſt advantageous ſituation for carrying on an extenſive correſpondence with every part of the world then known.

The invaſion by the northern nations in the fifth century, not merely arreſted the progreſs of commerce, but effectually diſſolved all commercial connections, and deprived the merchants of any market for their commodities. Europe became parcelled out into many ſmall and independent ſtates, differing from each other in language and cuſtoms; no intercourſe ſubſiſted between the members of theſe divided and hoſtile communities; their mode of life was ſimple, they had few wants to ſupply, and few ſuperfluities to diſpoſe of. Cities, in which alone an extenſive commerce can be carried on, were few, inconſiderable, and deſtitute of thoſe immunities which produce ſecurity or excite enterpriſe. It became diſagreeable and dangerous to viſit any foreign country, and thus the knowledge of remote regions was loſt; their ſituation, their commodities, and almoſt their names, were unknown. The preſervation of Conſtantinople from the general deſtruction, however, prevented commercial intercourſe with diſtant nations from ceaſing altogether. In that city the knowledge of ancient arts and diſcoveries was preſerved; a taſte for ſplendour and elegance ſubſiſted; the productions of foreign countries were in requeſt; and commerce continued to flouriſh there when it was almoſt extinct in every other part of Europe. The merchants of Conſtantinople did not confine their trade to the iſlands of the Archipelago, or to the adjacent coaſts of Aſia; they took a wider range, and following the courſe which the ancients had marked out, imported the commodities of the Eaſt Indies from Alexandria. When Egypt was torn from the Roman empire by the Arabians, the induſtry of the Greeks diſcovered a new channel, by which the productions of India might be conveyed to Conſtantinople. They were carried up the Indus, as far as that great river is navigable; thence they were tranſported by land to the banks of the river Oxus, and proceeded down its ſtream to the Caſpian ſea. There they entered the Volga, and ſailing up it, were carried by land to the Tanais, which conducted them into the Euxine ſea, where veſſels from Conſtantinople waited their arrival. This extraordinary and tedious mode of conveyance, Dr. Robertſon obſerves, is a proof not only of the violent paſſion which the inhabitants of Conſtantinople had conceived for the luxuries of the eaſt, and of the ardour and ingenuity with which they carried on commerce, but it demonſtrates, that during the ignorance which reigned in the reſt of Europe, a knowledge of remote countries was ſtill preſerved in the capital of the Greek empire. Robertſon's Hiſt. Amer. vol. i.

The devaſtations of the Huns in Italy induced many of the richeſt inhabitants of the country near the bottom of the Adriatic, to fly with their beſt effects into the numerous ſmall ſandy iſles lying amongſt the ſhallow waters near the ſhores of the continent; on which iſles, about ſeventy-two in number, they built ſuch habitations as their circumſtances would admit; and here by degrees aroſe the celebrated commercial city of Venice. Neceſſity firſt obliged them to devote themſelves to commerce, the earlieſt branch of which was naturally the fiſheries. Their next commercial object was the manufacture and exportation of ſalt. Thus by the application of its inhabitants, and the ſecurity of its ſituation, Venice gradually became the general magazine for the merchandize of the neighbouring continent, to which the many rivers that fall into the Adriatic ſea greatly contributed; and as the Venetians in time became the carriers of this merchandize into diſtant countries, they were enabled to bring back raw materials for various manufactures which greatly enlarged their commercial dealings.

In this manner, Venice firſt, and Genoa, Florence, and Piſa afterward, from inconſiderable places became populous and wealthy cities, and laid the foundation for the revival of commerce throughout the Mediterranean, which, in proceſs of time, was extended to the countries of Europe without the ſtreights of Gibraltar. The free cities of Italy, were, for ſeveral centuries, the only places in Europe, weſt of the Eaſtern or Greek empire, which had any conſiderable commerce, or any valuable manufactures for the ſupply of other nations. Their merchants frequented Aleppo, Tripoli, Alexandria, and other ports of Syria and Egypt, where they procured the produce of India; and viſiting the maritime towns of Spain, France, the Low Countries, and England, by diſtributing their commodities over Europe, communicated to its various nations ſome taſte for the valuable productions of the eaſt, as well as ſome ideas of manufactures and arts, which were then unknown beyond the precincts of Italy.

The firſt mention of the city of Antwerp, afterwards ſo famous for its trade, is in the year 517, when Theodoric expelled the Danes from it. Some towns in England, as Chicheſter and Abingdon, are ſaid to have been founded about this time, which ſhews that trade and manufactures were gaining ground in this country.

The unſettled ſtate of Europe, ariſing from the fierce and reſtleſs diſpoſition of the barbarous tribes who had taken poſſeſſion of the weſtern empire, cauſed for ſeveral centuries a great ſtagnation of commercial intercourſe. Venice however continued to improve its commerce, and London became "a mart town of many nations, which repaired thither by ſea and land." Some of the Italian cities began to aſſume a degree of independence, and ſeveral towns were founded in Germany and Flanders, which afterwards became of much commercial importance. The commerce of Europe revived a little under the government of Charlemagne, who, among other endeavours to promote it, is ſaid to have formed a project for uniting the two great rivers of the Rhine and the Danube, and thus forming a communication between the German ocean and the Black ſea, without ſailing up the Mediterranean. But his engineers had not ſufficient ſkill to overcome the difficulties they met with, and the undertaking was ſoon relinquiſhed. In a letter from this prince to Offa, king of Mercia, he grants leave for ſuch Engliſh as went in pilgrimage to Rome, to paſs through his dominions free; but ſuch as travelled for the purpoſes of trade were to pay the cuſtomary tolls; and promiſes that the merchants ſhould have legal patronage and redreſs of grievances. Theſe merchants were probably perſons who carried their whole ſtock with them, which of courſe could not be of any very great amount.

The eſtabliſhment of Chriſtianity in Germany produced a much more intimate and regular correſpondence between the north of Europe, and the earlier Chriſtianized countries of Italy, France, Spain, and Britain; ſo that their ſuperfluities and produce were mutually communicated to each other, while Germany received by degrees, from its intercourſe with thoſe countries, conſiderable improvements with reſpect to agriculture, mining, vine-dreſſing, manufactures, and the arts, more immediately conducive to the comforts of civilized life. It conſiderably increaſed the cities and towns, where cathedral churches and houſes for the biſhops and clergy were erected. Thus the propagation of Chriſtianity greatly favoured the advancement of commerce in the north of Europe; while Charlemagne by his conqueſt of Italy, and by rebuilding and reſtoring many of the decayed cities of that country, inſpired thoſe cities with the ſpirit of commerce, manufacture, and navigation, for which they became in after times ſo juſtly famous. This period may be conſidered as the firſt dawn of the revival of commerce in Europe; for although ſubſequent to this time the Saracens or Moors, and the Normans, by their ravages and conqueſts in various parts, greatly obſtructed and retarded its progreſs, yet in ſpite of all oppoſitiom, the free cities in both the extreme parts of Europe in conſequence of the increaſe of their wealth and population from the encouragement of commerce, gradually aroſe to very conſiderable importance.

In the tenth century, the commercial intercourſe which the Germans had previouſly cultivated with the neighbouring ſtates was much increaſed by the diſcovery of valuable ſilver mines at Goſlar in Saxony, which occaſioned other parts of Germany to be explored for mines with conſiderable ſucceſs. The woollen manufacture of Flanders began to acquire ſome degree of importance, being much encouraged by Baldwin, third earl of Flanders, who invited into the country all manner of handicraftſmen for making all ſorts of manufactures, to whom he granted great privileges. He alſo eſtabliſhed annual fairs, and fixed markets on ſtated days of the week at Bruges, Courtray, Torhout, Mont-Caſſel, and other places, where merchants could exchange their goods for others; for "by reaſon of the ſcarcity of money at that time, the Flemings dealt moſtly by permutation, or barter of one kind of merchandize for another: which we read was alſo the practice of almoſt all the Germans and Sarmatians."

The republic of Venice had now acquired ſo much wealth and ſtrength by the great extenſion of her commerce, as to have become a formidable political ſtate, and having annexed to their dominions many cities and towns on the eaſt coaſt of the Adriatic ſea, the doge of Venice aſſumed the title of duke of Dalmatia. They eſtabliſhed a regular commercial intercourſe with the Saracens of Egypt and Syria, "countries ever famous for the production of rice, ſugar, dates, ſenna, caſſia, flax, linen, balm, perfumes, galls, wrought ſilk, ſoap, &c. beſides the rich ſpices and precious ſtones of India, brought to thoſe two countries; with all this rich merchandize, the Venetians now traded all over the weſtern parts of Europe, to their immenſe profit." They obtained from the Greek emperors a freedom from all cuſtoms and taxes in their empire; and in the year 996 the emperor Otho III. likewiſe granted them various privileges, with a right to ſet up fairs in ſeveral parts of Germany, where they carried on a vaſt commerce.

The cruſades contributed materially to the extenſion of commerce during the 11th and 12th centuries. The Genoeſe, the Piſans, and the Venetians, furniſhed the tranſports neceſſary to carry the vaſt armies that embarked on theſe wild enterprizes: they alſo ſupplied them with proviſions and military ſtores. Beſides the immenſe ſums which they received on this account, they obtained commercial privileges and eſtabliſhments of great conſequence, in the ſettlements which the cruſaders made in Paleſtine, and in other provinces of Aſia. From theſe ſources they acquired great wealth, and a proportionate increaſe of power. By the expeditions into Aſia, the inhabitants of all the ſtates of Europe had an opportunity of obſerving the manners, the arts, and the accommodations of people more poliſhed than themſelves. The adventurers who returned from Aſia communicated to their countrymen the ideas which they had acquired, and the habits of life they had contracted by viſiting more refined nations. The Europeans began to be ſenſible of wants with which they were formerly unacquainted; and ſuch a taſte for the commodities and arts of other countries gradually ſpread among them, that they not only encouraged the reſort of foreigners to their harbours, but began to perceive the advantage and neceſſity of applying to commerce themſelves.

The great commercial progreſs of the city of Lubeck ſoon cauſed other towns to be founded in the neighbourhood of the Baltic; which, ſuffering much from the occaſional attacks of neighbouring powers, and the depredations of pirates, were induced to enter into an aſſociation for their mutual ſafety, and the protection of their navigation. Thus was gradually formed the famous Hanſeatic confederacy, which made ſo great a figure in the commercial hiſtory of ſeveral ſucceeding centuries, and of which Lubeck was from the firſt conſidered as the director or head. Werdenhagen fixes on the year 1169 for the firſt of this confederacy, which conſiſted of the twelve following towns on the Baltic ſhore: viz. Lubeck, Wiſmar, Roſtock, Straelſund, Grypeſwald, Anclam, Stetin, Colberg, Stolpe, Dantzick, Elbing, and Koningſberg; though probably not all of them at the firſt; as ſome of them do not appear to have been founded till a later period. Lambecius, librarian to the emperor Leopold, is of opinion, that the Hans-league did not properly commence till after the league between Lubeck and Hamburgh in 1241, at which time the towns comprehended in this aſſociation were in poſſeſſion of all the commerce of the ſouth ſhores of the Baltic, from Denmark to the bottom of the gulph of Finland, beſides an extenſive commerce to more diſtant parts. About this time the commerce of Norway began to acquire ſome degree of importance, and in a treaty between the monarch of that country and Henry III. of England, in 1217, it was agreed that their reſpective ſtates ſhould be free for merchants and others on both ſides.

At the beginning of the 13th century, the German merchants of the Steel-yard engroſſed all the foreign commerce which then exiſted in England, which at that time had very few merchants, and fewer ſhips of her own. About 1250, however, a ſociety of Engliſh merchants was formed, who are ſaid to have had privileges granted to them in the Netherlands, by John duke of Brabant; whither they had begun to reſort with Engliſh wool, lead, and tin, bringing in return fine woollen cloths, linen, and other articles. From this ſociety, the company ſtyled "Merchants of the ſtaple of England" took its riſe. In 1274, a treaty was concluded with the earl of Flanders for the ſettlement of ſome commercial diſputes which exiſted between the two countries.

France at this period poſſeſſed very little foreign commerce, but in the cities of Italy it had increaſed greatly. The republic of Genoa was in its meridian glory, being the greateſt maritime power then exiſting. Even Venice, great as it was now become, was eclipſed by Genoa, which, towards the concluſion of this century, had reduced the republic of Piſa, till then alſo powerful at ſea, to the loweſt ebb of fortune, never again to riſe to greatneſs, and ſoon to loſe her independence.

A new æra was now about to commence in commercial hiſtory. The diſcovery of that valuable, but now familiar inſtrument, the mariner's compaſs, Dr. Robertſon obſerves, may be ſaid to have opened to man the dominion of the ſea, and to have put him in full poſſeſſion of the earth, by enabling him to viſit every part of it. But the effects of this diſcovery were not ſo ſudden or extenſive as might be expected. The uſe of the compaſs enabled the Italians to perform the ſhort voyages to which they were accuſtomed, with greater ſecurity and expedition, but near half a century elapſed, before navigators ventured into any ſeas which they had not been accuſtomed to frequent. One of the firſt fruits of ſuch adventures, was the diſcovery of the Canary iſlands by the Spaniards.

Many of the princes of Europe were now becoming more ſenſible of the importance of commerce, which led them to enter into treaties for its regulation and defence. Edward I. in 1302 publiſhed his famous charter ſtyled Charta Mercatoria, by which "The merchants of Almaine, France, Spain, Portugal, Navarre, Lombardy, Florence, Provence, Catalonia, Aquitaine, Thoulouſe, Flanders, Brabant, and of all other foreign parts, who ſhall come to traffic in England, ſhall and may ſafely come with their merchandize into his cities, towns, and ports, and ſell the ſame, by wholeſale only, as well to natives as to foreigners." Some particular articles they were allowed to ſell by retail; and they were to export any goods they might want from England on paying the uſual cuſtoms, except wine, which could not be exported without a ſpecial licence. The countries here mentioned ſhew the parts to which the commerce of England was at that time chiefly confined; and a very good idea of its extent may be gained from the following account of the exports and imports, in the 28th year of Edward III. from a record in the Exchequer.

Exports.	£.	s.	d.
31,651½ ſacks of wool, at ſix pounds per ſack, and 3036 hundred weight and 65 fells, each hundred weight being 6 ſcore, at forty ſhillings per hundred weight, with the cuſtoms, &c. thereon, amounted to - - -	277,606	2	9
Leather, with its cuſtom - - - - - -	96	2	6
4774½ coarſe cloths, at 40 ſhillings each, and 8061½ pieces of worſted, at 16*s.* 8*d.* per piece - - - - - - -	16,266	18	4
Cuſtoms thereon - - - - - - - - - -	215	13	7
Total Exports, with the duties thereon	294,184	17	2

Imports.			
1831 fine cloths, at 6*l.* per cloth, which, with the cuſtoms, comes to -	11,083	12	0
397¾ hundred weight of wax, at 40 ſhillings per hundred weight, which, with the cuſtoms, comes to - - - - -	815	7	5
1829½ tons of wine, at 40 ſhillings per ton, which, with the cuſtoms, comes to - - - - - - - - - - - - -	3,841	17	0
Linen cloth, mercery, grocery, and all other wares whatever - - - - -	22,943	6	10
On which the cuſtom was - - - - - -	285	18	3
Total Imports, with the duties thereon	38,970	3	6

Thus, as ſir William Temple obſerves, "when England had but a very ſmall foreign commerce, we were rich in proportion to our neighbours, by ſelling ſo much more than we bought." It is not very probable, however, that the exceſs of the exports was generally ſo great as is here ſtated.

The materials of commerce were now increaſing by the improvement of manufactures in various parts of Europe; while the diſcoveries of the Portugueſe on the coaſt of Africa, and in the adjacent ſeas, excited a more enterpriſing ſpirit of mercantile adventure, and at length, in 1487, led to the diſcovery of the Cape of Good Hope, which they doubled about ten years after, and thus accompliſhed the firſt regular voyage to the Eaſt Indies. About the ſame time alſo was accompliſhed the great diſcovery of the weſtern continent. Theſe events, which filled the world with aſtoniſhment, and gave riſe to an infinity of new ſpeculations, have ſince ſupplied it with a prodigious increaſe of wealth, and with many new and excellent materials for the immenſe additional commerce which has thus accrued to all the ſtates of Europe.

The whole of the vaſt regions diſcovered in the Eaſt and Weſt, was by the papal authority divided between the Spaniards and Portugueſe. The former firſt made herſelf miſtreſs of the iſlands, and next of the principal part of the continent of America; in conſequence of which the cities of Seville and Cadiz became the ſtore-houſes for the riches of the newly-diſcovered weſtern world. Portugal purſued her commerce and rapid conqueſts in the Eaſt Indies, ſo that

Liſbon ſoon became (what the now declining city of Venice had been for many centuries paſt) the great magazine for all the rich productions of the Eaſt. They had alſo diſcovered Braſil in South America, which ſoon became an almoſt inexhauſtible fund of wealth to Portugal, which may be ſaid to have been then at the height of its commercial greatneſs.

In the courſe of the 16th century many circumſtances occurred which contributed greatly to the extenſion of commerce. The Engliſh in the purſuit of a north-weſt paſſage to India had diſcovered the whole coaſt of North America, where, after ſome years, they began to attempt ſettlements. They engaged in the Newfoundland fiſhery, and alſo in the whale fiſhery at Spitſbergen or Greenland. The continual jealouſies and diſputes between the Engliſh merchants and the German Hanſeatic merchants of the Steel-yard in London, were at length terminated by the abolition of the peculiar privileges of the latter. The diſcovery of a paſſage to Ruſſia round the north Cape of Lapland, opened a field for other new diſcoveries, and new branches of commerce; in conſequence of which a company for trading to Ruſſia was immediately formed and incorporated. The commerce with Turkey was encouraged by the incorporation of a company; and the intercourſe with Guinea and other places on the coaſt of Africa, was alſo thought of ſufficient importance to have a company eſtabliſhed for carrying it on.

While the importance of the Italian cities was declining, and the commerce of the towns on the Baltic experiencing ſome diminution, the cities of Hamburgh and Antwerp had riſen into conſiderable importance. The latter in particular, from the convenience of its ſituation, might for ſome time be conſidered as the centre of the commerce of Europe, as well for the merchandize of both the Indies, as for the naval ſtores and other bulky commodities of the northern ſtates. It was however ſoon to find a rival among its induſtrious neighbours in the United Provinces, who, from the time of their independence, applied themſelves to manufactures and commerce with the utmoſt aſſiduity. France was at this time beginning to encourage the cultivation of the vine, and the improvement of her broad ſilk manufacture; while Spain, by expelling the proteſtants from the Netherlands, ſupplied England, Holland, and the Hanſe-towns with great numbers of wealthy and induſtrious manufacturers and artificers, as well as with an acceſſion of many ingenious and beneficial new manufactures.

The 17th century was the period in which the principles were adopted, and moſt of the eſtabliſhments formed, which have contributed to advance the commerce of Europe to its preſent aſtoniſhing height. The intereſts of nations became better underſtood than in any former age; the utility of commerce had become evident to every one, from the wealth and power it had conferred on the ſtates which had encouraged it; and commercial treaties became frequent between the different nations. Navigation was improved; new ſettlements were formed, and many of thoſe before made were riſing into importance; manufactures were advancing in many parts of Europe; ſhipping was increaſing, and the intercourſe between diſtant places, from the accumulation of knowledge and experience, becoming more expeditious and ſecure.

The lucrative commerce of the Eaſt became one of the leading objects of mercantile purſuit. An Engliſh Eaſt India company was formed in 1600; and the Dutch companies, which were united in 1602, became one of the moſt celebrated commercial eſtabliſhments ever formed. The French viſited the Eaſt Indies in 1601, but did not eſtabliſh a regular company for carrying on the trade till 1664. The Danes eſtabliſhed an Eaſt India company in 1617, and in 1627 the king of Sweden iſſued letters patent for forming an Eaſt India company, but it was not carried into execution till ſome years after. The Spaniards and Portugueſe, however, at this period, poſſeſſed by far the greateſt ſhare of the commerce of India, which had now become very conſiderable. The following account publiſhed by Mr. Munn, in 1621, of the quantity of Indian merchandize conſumed annually in Europe, gives a very good idea of the proportion of the different articles of this branch of commerce: the prices affixed are the prime coſt in India, including all charges till actually ſhipped for Europe.

	s.	*d.*	
6,000,000 lb. pepper, at	0	2½	per lb.
450,000 lb. cloves, at	0	9	per lb.
150,000 lb. mace, at	0	8	per lb.
400,000 lb. nutmegs, at	0	4	per lb.
350,000 lb. indigo, at	1	2	per lb.
1,000,000 lb. raw ſilk, at.	8	0	per lb.

This ſtatement was probably meant to include only the principal articles; at leaſt it is certain that about 1631 ſeveral other kinds of merchandize were uſually imported from India, as taffaties, painted callicoes, drugs of various ſorts, and China ware. Tea, the great object of commercial intercourſe with China, was either not yet an object of commerce, or was imported in ſuch ſmall quantities, that in England at leaſt, in 1660, it was not thought of ſufficient conſequence to be ſubjected to a duty.

Dr. Davenant, who publiſhed his "Diſcourſes on Trade" in 1698, was of opinion, that from about the year 1656 to 1688, England had every year gradually increaſed in riches; and that about the laſt mentioned year, the increaſe or addition to the wealth, and general ſtock of the nation, ariſing from foreign trade and home manufactures, was at leaſt two millions per annum. In this eſtimate the different branches of trade are ſtated as follows:

The plantation trade may bring in -	£ 600,000
The Eaſt India trade may bring in -	500,000
The European, African, and Levant trade, by our own product may bring in - - -	600,000
Ditto, by re-exports of plantation goods - - -	120,000
Ditto, by re-exports of Eaſt India goods - - -	180,000
Total	2,000,000

This account is probably ſomewhat beyond the truth, with reſpect to the period to which it refers; but that there had been a conſiderable influx of wealth, is ſhewn by the obſervations of the ſame author, that from the year 1600 to 1688, the general rental of England was nearly trebled, and the purchaſe of land half doubled; that the ſtock of the kingdom was multiplied above five fold, and the money in circulation above four fold. This rapid advance in wealth, can be aſcribed to no other cauſe than the improvement of commerce, which was now becoming of the utmoſt importance to all the European ſtates, particularly to ſuch as were deſirous of maintaining any degree of naval power.

The increaſe of wealth ariſing from the extenſion of commerce, gave riſe to the eſtabliſhment of banks, by which its operations have of late years been ſo much facilitated. The commercial cities of Venice and Genoa had long experienced the utility of ſuch inſtitutions, which were now adopted in other ſtates. The banks of Amſterdam, of

Hamburgh, and of Rotterdam were eſtabliſhed; and in 1694, the bank of England, and the bank of Scotland. The buſineſs of private bankers likewiſe took its riſe, and had become conſiderable, when it received a ſevere check from the unjuſtifiable conduct of Charles II. in ſeizing the money which the bankers had advanced on credit of the taxes. This branch of mercantile intercourſe has however been ſince carried to an extent which in former times would have been deemed wholly incredible.

Thus, with its principles generally underſtood; with moſt of the eſtabliſhments formed which are neceſſary to facilitate its operations; with laws and treaties in force for its encouragement and protection; markets eſtabliſhed for the purchaſe or ſale of commodities in almoſt every part of the globe; navigation brought to a high degree of perfection, vaſt improvements in arts and manufactures; and a great increaſe of artificial wants from the progreſs of luxury and refinement; the commerce of the world, and particularly of Europe, has, during the 18th century, expanded in an aſtoniſhing degree, and become intimately connected with the political exiſtence of almoſt every ſtate.

COMMERCE *of Great Britain.* The moſt authentic materials from which an idea can be formed of the progreſs and extent of the commerce of Great Britain, are the accounts kept in the office of the inſpector-general of exports and imports, at the cuſtom-houſe of London. Theſe accounts do not ſhew the current value of the commodities exported or imported, but are formed from their quantities, according to certain rates of value affixed to the ſeveral articles of foreign trade in 1696, by which they have been rated ever ſince. It is evident, therefore, that, as the price of all kinds of merchandize is ſubject to great fluctuations, and in general has much increaſed in this country within the laſt hundred years, theſe accounts are far from ſhewing the actual values in the later years; they are, however, from this very circumſtance of being uniformly made up at the ſame rates, the better adapted to a comparative view, and ſhew a progreſſive increaſe which has arrived to an amount never before known in the commerce of any nation. According to theſe eſtimates the total amount of the exports and imports of Great Britain have been as follows:

Years.	Imports.	Exports.
1700	£5,970,175	£7,302,716
1701	5,869,606	7,621,053
1702	4,159,304	5,235,874
1703	4,526,596	6,644,103
1704	5,383,200	6,552,019
1705	4,031,649	5,501,677
1706	4,113,933	6,512,086
1707	4,274,055	6,767,178
1708	4,698,663	6,969,089
1709	4,510,593	6,627,045
1710	4,011,341	6,690,828
1711	4,685,785	6,447,170
1712	4,454,682	7,468,857

At the concluſion of the war, by the peace of Utrecht, a commercial treaty with France was likewiſe negociated: but when the particulars of it came to be diſcuſſed, two of the articles, by which the produce and manufactures of France were to be admitted into this country on the ſame terms as thoſe of the moſt favoured nation, excited ſuch general diſapprobation, that the bill for carrying it into effect was rejected by the houſe of commons. The ſtrongeſt objection to the principle of the treaty, was that it might ruin the trade then carried on with Portugal, which was conſidered as the moſt valuable branch of our European commerce.

It is evident, that from the year 1705, notwithſtanding the diſadvantages it always labours under in time of war, commerce had been gradually increaſing; but when peace enabled it to return to its uſual channels, and reſtored ſome branches which had been conſiderably interrupted, its general advancement became more obvious, and although from the mode then uſually adopted, of judging of the profits of commerce merely by the exceſs of the value of the exports, the balance appeared leſs than it had been in former years, the wealth which flowed into the country from foreign trade, being no longer abſorbed in public wars, ſoon enabled the government to make a permanent reduction in the legal rate of intereſt. The war with Spain in 1718, did not cauſe much interruption of commercial intercourſe, except in the direct trade with that country.

Years.	Imports.	Exports.
1713	£5,811,077	£7,352,655
1714	5,929,227	8,361,638
1715	5,640,943	7,379,409
1716	5,800,258	7,614,085
1717	6,346,768	9,147,700
1718	6,669,390	8,255,302
1719	5,367,499	7,709,528
1720	6,090,083	7,936,728
1721	5,768,510	8,681,200

At this period the judicious principle of promoting the exportation of Britiſh manufactures, which had hitherto been applied only to woollen goods, was extended to Britiſh manufactures and produce in general; which were allowed to be exported duty free, except a few articles chiefly materials for manufactures, the exportation of which it would not have been proper to encourage; while drugs and other materials uſed for dyeing, were, upon being firſt duly entered, to be imported duty free, but upon re-exportation were to pay ſpecific duties. For this highly beneficial regulation, ſo ſimple in its principle, and ſo comprehenſive in its extent, the country was indebted to the enlightened wiſdom of Mr. Walpole: the experiment excited much doubt and ſolicitude as to its ſucceſs, but it ſoon appeared that the loſs of revenue in the duties thus given up, was a mere trifle in compariſon with the ſtimulus it gave to manufactures and the conſequent extenſion of commerce.

Years.	Imports.	Exports.
1722	£6,378,098	£9,650,789
1723	6,505,676	9,489,811
1724	7,394,405	9,143,356
1725	7,094,708	11,352,480
1726	6,677,865	9,406,731
1727	6,798,908	9,553,043
1728	7,569,299	11,631,383
1729	7,540,620	11,475,771
1730	7,780,019	11,974,135
1731	6,991,500	11,167,380
1732	7,087,914	11,786,658
1733	8,016,814	11,777,306
1734	7,095,861	11,000,645
1735	8,160,184	13,544,144
1736	7,307,966	11,616,356
1737	7,073,638	11,842,320
1738	7,438,960	12,289,495

The above period was almoſt wholly a time of peace, during which the commerce of Great Britain was gradually advancing, both from the improvement of ſeveral of the exiſting branches, and the acquiſition of new ones. The South-ſea company undertook the Greenland whale fiſhery, which had been entirely relinquiſhed by this country for ſome years paſt; and encouragement was given to fiſheries on the coaſt of America. Attempts were made to obtain a ſhare of the fur trade of north America, which was almoſt entirely in the hands of the French. The Oſtend Eaſt India company, which had been found prejudicial to the Engliſh trade in thoſe parts, was ſuſpended; while our trade with China increaſed conſiderably, particularly in the article of tea. The trade of the Levant company was very flouriſhing; as was likewiſe that of the Hudſon's bay company, though the latter was but of ſmall extent. The produce of ſeveral valuable commodities was at the ſame time augmenting, from an increaſed cultivation of rice in the American colonies, and of coffee in the Weſt India iſlands, while great quantities of corn were annually exported from Great Britain to France, Portugal, Spain, and Italy.

The war which began in 1739, was occaſioned chiefly by diſputes reſpecting our commerce in the Weſt Indies, which had been much interrupted by the Spaniards. It cauſed, at firſt, ſome decline of foreign trade, which however ſoon regained the extent to which it had been carried during the preceding peace.

Years.	Imports.	Exports.
1739	£7,829,373	£9.495,366
1740	6,703,778	8,869,939
1741	7,936,084	11,469,872
1742	6,866,864	11,584,427
1743	7,802,353	14,623,653
1744	6,362,971	11,429,628
1745	7,847,123	10,497,329
1746	6,205,687	11,360,792
1747	7,116,757	11,442,049
1748	8,136,408	12,351,433

At this time, a much greater proportion of the exports conſiſted of unmanufactured produce than it has ſince; as it appears there had been exported from England in five years, from 1744 to 1748, no leſs than 3,768,444 quarters of corn, which at medium prices was worth 8,007,948 *l*.

That a conſiderable increaſe of commerce had taken place, is evident from the quantity of ſhipping employed. The total tonnage of veſſels that cleared outwards on an average of three years preceding the war, had been 503,568 tons; the average of the three years, ending with 1751, was 661,184 tons. The encouragement of the fiſheries, and the regulation of the Guinea or African trade, which had been in the hands of an excluſive company, but was now in a great meaſure laid open; cauſed ſome extenſion of foreign trade, although the Levant, or Turkey trade, which had been conſidered as one of the moſt valuable branches, was beginning to decline rapidly, from the French improving the natural advantages they poſſeſs for a trade with thoſe parts.

Years.	Imports.	Exports.
1749	£7,917,804	£14,099,366
1750	7,772,039	15,132,004
1751	7,943,436	13,967,811
1752	7,889,369	13,221,116
1753	8,625,029	14,264,614
1754	8,093,472	13,396,853
1755	8,772,865	12,182,255
1756	7,961,603	12,517,640
1757	9,253,327	13,438,285
1758	8,415,025	15,034,994
1759	8,922,976	14,696,892
1760	9.832,802	15,579,073
1761	9 543,901	16,365.953
1762	8,870,234	14,134,093

It is evident that commerce had not been very materially affected by the war. The years 1755 and 1756 marked the loweſt point of its depreſſion; whence it gradually roſe, till it had gained a ſuperiority over the unexampled traffic of 1750, a year of eſtabliſhed peace and ſecurity.

By the peace of 1763, although many iſlands which had been taken in the Weſt Indies were reſtored, Great Britain retained a number of newly acquired iſlands, perhaps more than could be immediately brought into cultivation with advantage. The arrangements reſpecting Aſia were very favourable to the Eaſt India company; and in Africa an excluſive trade was ſecured in the article of gum Senegal, a material indiſpenſably neceſſary to the perfection of many of our manufactures. The immediate conſequence, however, of the acquiſition of additional territories, was, that a wide field was opened for ſpeculation and commercial enterpriſe, which cauſed much productive capital to be withdrawn from the trade and manufactures of Great Britain; yet our merchants were not only able to maintain their own credit, but alſo to aſſiſt their correſpondents during the commercial embarraſſments in Holland and other parts of the continent.

In 1765, the principles and meaſures were adopted which ſoon involved the country in diſputes with its American colonies. Impolitic reſtrictions were laid on a beneficial intercourſe which had long ſubſiſted between the Britiſh colonies and the Spaniſh Weſt India ſettlements; which being ſoon followed by other cauſes of diſcontent, drove the Americans into public reſolutions to make no further importations from Great Britain, but ſuch as were unavoidably neceſſary, and to encourage, to the utmoſt of their power, every kind of manufacture that was practicable among themſelves. This ſtep ſoon produced ſerious effects in Great Britain; the merchants connected with America found themſelves unable to fulfil their engagements by the ſtoppage of large ſums due to them from that country; the whole ſyſtem of their buſineſs was deranged, and general diſtreſs ſpread through the circle of their connections; the manufacturers ſuffered by the want of regular payments from the merchants, while their materials, and made up goods, to an alarming amount, were becoming a dead ſtock upon their hands; in conſequence of which, great numbers of workmen were thrown out of employ. Petitions were preſented to parliament from all the trading and manufacturing towns, which probably had ſome effect in procuring a temporary adjuſtment of the diſpute.

The non-importation agreement in America, was renewed in 1769 and 1770; yet the commerce of Great Britain, notwithſtanding theſe interruptions of an important branch of it, continued to increaſe; and previous to the war which followed, had attained to a greater extent than in any former years.

Years.	Imports.	Exports.
1763	£11,665,036	£16,160,181
1764	10,364,307	16,512,403
1765	10,889,742	14,550,507
1766	11,475,775	14,024,964
1767	12,073,956	13,844,511
1768	11,878,661	15,117,982
1769	11,908,560	13,438,236

1770

Years.	Imports.	Exports.
1770	12,216,937	14,266,653
1771	12,821,995	17,161,146
1772	14,508,715	18,732,379
1773	12,522,643	16,654,052
1774	14,548,902	17,607,447

The prohibition of all trade and intercourſe with the American colonies excited ſerious alarms, not only on account of the loſs of a valuable branch of trade, but from the ſuppoſed encouragement which the acquiſition of it would give to the trade of thoſe powers who aſſiſted the colonies. Theſe apprehenſions, however, in a few years appeared to be in a great meaſure groundleſs, many Britiſh manufactures found their way to America, though not imported directly from hence; and Mr. Chalmers obſerves, that "there was an evident tendency in our traffic to riſe in 1779, till the Spaniſh war impoſed an additional burthen. There was a ſimilar tendency in 1780, till the Dutch war added, in 1781, no inconſiderable weight. And the year 1781, accordingly, marks the loweſt degree of depreſſion, both of our navigation and our commerce, during the war of our colonies. But with the ſame vigorous ſpirit, they both equally roſe, in 1782, as they had riſen in former wars, to a ſuperiority over our navigation and commerce, during the year wherein hoſtilities with France began."

Years.	Imports.	Exports.
1775	£ 14,816,955	£ 16,946,523
1776	12,449,189	15,685,107
1777	12,643,834	14,152,243
1778	10,975,533	12,375,712
1779	11,435,263	13,597,771
1780	11,714,967	13,689,073
1781	12,723,613	11,470,388
1782	10,341,628	13,224,637

The opportunity of renewing the commercial connections between this country and America, from the concluſion of peace, was eagerly embraced; but ſubſequent experience proved, that a greater degree of caution had now become neceſſary to render it a beneficial trade. The arrangements relative to the commerce of Ireland, had a very beneficial effect in that country, which had hitherto been excluded from almoſt every ſpecies of commerce, and reſtrained from ſending the produce of her own ſoil to foreign markets. The convention with Spain ſettled more accurately the limits within which Britiſh ſubjects were allowed to cut logwood on the Muſquito coaſt, and conſequently gave greater certainty and ſecurity to the trade with thoſe parts. The commercial treaty with France, by diſcontinuing many of the prohibitions and prohibitory duties which had exiſted for almoſt a century between the two nations, opened a wide field for ſpeculation and adventure. The conſolidation of the cuſtoms by the abolition of all the confuſed and complex duties which then exiſted, and the ſubſtitution of a ſingle duty on each article in their ſtead, was a meaſure of great convenience to all perſons engaged in mercantile tranſactions. Under all theſe circumſtances, ſupported by the improvements which had taken place in ſeveral of the principal manufactures, the foreign trade of Great Britain increaſed greatly during the peace, and in the year 1792, had attained to an unparallelled height, both in point of value, and with reſpect to quantity of ſhipping employed in it.

Years.	Imports.	Exports.
1783	£ 13,122,235	£ 15,450,778
1784	15,272,802	14,961,074
1785	16,279,490	16,770,239
1786	15,786,072	16,300,730
1787	17,804,024	16,870,114
1788	18,027,170	17,472,408
1789	17,821,102	19,340,548
1790	19,130,886	20,120,121
1791	19,669,782	22,731,995
1792	19,659,358	24,905,200

The total number of veſſels which belonged to the ſeveral ports of the Britiſh empire on the 30th September 1792, was 16,079; the amount of their tonnage 1,540,145 tons; and the number of men and boys uſually employed in navigating them 118,286. The number of veſſels that entered inwards at the ſeveral ports of Great Britain (including their repeated voyages) was as follows:

	Ships.	Tons.
Britiſh - - -	12,030	1,587,645
Foreign - - -	2,477	304,074
Total	14,507	1,891,719

At this period, the commerce of Great Britain was generally admitted to be in a very flouriſhing ſtate. The application and improvement of machinery in almoſt every branch of manufacture, had reduced the charges of workmanſhip ſo far, as to enable our manufacturers to ſupply foreign markets on better terms than any other country could offer; while the increaſe of capital, ariſing from the accumulation of the profits of ſucceſsful commerce during a period of peace, gave our merchants the means of allowing longer credit than could be obtained elſewhere. The high price of the public funds, led many perſons to employ their money in diſcounting private ſecurities, which greatly facilitated the extenſion of commercial credit, but probably tempted ſome to trade much beyond the amount which their capital juſtified, or to ſpeculate largely without any real property of their own; ſo that when the apprehenſion of war produced a greater degree of caution, and began to affect particular branches of trade, many were involved in embarraſſments; and on the commencement of the war in 1793, commercial concerns, in general, experienced a ſerious ſhock. The aſſiſtance afforded by government to ſuch houſes as appeared to be really ſolvent, by lending them exchequer bills for a certain time, operated very ſucceſsfully, and averted the conſequences that were apprehended; credit revived, and as the war in its progreſs almoſt annihilated the foreign trade of ſome of the powers engaged in it, the commerce of Great Britain received a conſiderable augmentation; and, protected by its naval ſuperiority, continued to increaſe, notwithſtanding all the meaſures which political animoſity could deviſe to obſtruct or deſtroy it.

Years.	Imports.	Exports.
1793	£ 19,256,717	£ 20,390,180
1794	22,288,894	26,748,967
1795	22,736,889	27,312,338
1796	23,187,319	30,424,184
1797	21,013,956	28,917,010
1798	27,857,889	33,591,777
1799	26,837,432	35,991,329

Years.	Imports.	Exports.
1800	30,570,605	43,152,019
1801	32,795.557	42,301,701

The increaſe during the above period, though really very great, was not however equal to what it would appear from the above accounts to have been. This irregularity in the comparative view which the account of imports and exports generally furniſhes with ſufficient accuracy, of the commerce of Great Britain, ariſes from the article of coffee, the import of which was formerly little more than ſufficient to ſupply its ſmall conſumption in this country. But the interruption of the trade of France, the conqueſt of their Weſt India iſlands, and the greatly increaſed cultivation of coffee in Jamaica, cauſed nearly the whole ſupply of the continent with this commodity to depend during the war on Great Britain. In the inſpector-general's book of rates, coffee is valued on importation at 7 *l.*, and on exportation, at no leſs than 14 *l.* 10 *s.* per cwt.; while, during the above period, the real average value was about 5 *l.* per cwt. when imported, and 5 *l.* 10 *s.* when exported. The official account, therefore, from 1794, when coffee ſuddenly became a very conſiderable article of exportation, requires ſome correction; and if the over-eſtimated value of this article is deducted, the exports of the year 1800 will appear to have been 38,120,120 *l.*, and of 1801, 37,786,856 *l.*

The ſhort interval of peace in 1802, produced an immediate extenſion of foreign trade; and Mr. Addington thought himſelf juſtified "in pronouncing the commerce of the country to be in a ſtate of unrivalled and unexampled proſperity." The value of Britiſh manufactures exported, conſiderably exceeded the preceding year, and the total amount of the exports, according to the official values, was 46,120,962 *l.* But in this and the ſucceeding years, it will be proper to adopt the correction juſt mentioned, which will give the amount of the imports and exports as follows:

Years.	Imports.	Exports.
1802	£ 31,442,318	£ 41,411,966
1803	27,992,464	31,578,495
1804	29,201,490	34,451,367
1805	30,344,628	34,954,845
1806	31,094,089	36,528,132

The account of imports for the laſt year is not quite correct; the imports from the Eaſt Indies for that year being incomplete.

Almoſt every article being greatly under-valued in theſe accounts (except in one or two inſtances) the total muſt give a very inadequate idea of the real extent of the commerce of Great Britain. Some idea may be formed of the under-valuation of the imports by thoſe of the Eaſt India company, taking the account of their ſales as the importation; the medium value of which, on an average of three years, was 6,100,000 *l.*; whereas, the medium value by the accounts of the inſpector-general, for the ſame three years, was 4,572,000 *l.* Of the actual value of Britiſh produce and manufactures exported, which uſually conſtitutes about two-thirds of the total export, we have more correct information. By an act paſſed in 1798, and revived in 1802, called the convoy act, the exporters were required to declare the real value of Britiſh manufactures exported, in order to aſcertain the amount of duty chargeable thereon; and from theſe declarations, the actual value of Britiſh produce and manufactures exported has been aſcertained as follows:

In 1803	£ 40,100,870
1804	40,349,642
1805	41,068,942
1806	43,242,176

The extent of ſhipping employed in commercial intercourſe at this period, will be ſeen in the following account of the number of veſſels which belonged to the ſeveral ports of the Britiſh empire, on the 30th September 1805.

	Ships.	Tons.	Men & Boys.
England - - -	14,790	1,799,210	117,668
Jerſey & Guernſey	185	16,528	2,011
Iſle of Man - -	404	9,650	2,336
Scotland - - -	2,581	210,295	15,160
Ireland - - - -	1,067	56,806	5,070
The Plantations -	3,024	190,953	15,407
	22,051	2,283.442	157,712

The commerce of Great Britain with *Ireland*, has increaſed with the improvement of that country, particularly ſince the year 1780, when a more liberal ſyſtem of policy was adopted with reſpect to the foreign trade of Ireland. The imports from thence conſiſt chiefly of butter, beef, pork, bacon, lard, tallow, cattle, hides, feathers, ſtarch, rape-ſeed, linens, linen-yarn, woollen-yarn, pearl-aſhes, copper-ore, and a few other articles of leſs importance. The exports are coals, ironmongery and hardware, hoops for barrels, beer, cyder, dried cod, herrings, chiefly from Scotland, earthenware, bottles and window-glaſs, refined ſugar, hops, lead, tin-plates, ſail-cloth, cabinet-ware, wearing apparel, apothecaries-ware, books and ſtationary, painters' colours, hats, haberdaſhery, woollen, cotton, and ſilk manufactures of all kinds; with rum, brandy, geneva, wines, groceries, drugs, dye-ſtuffs, flax and hemp, raw and thrown ſilks, and other foreign produce.

Years.	Imports.	Exports.
1798	£ 2,735,686	£ 2,974.363
1799	2,770,731	4,086,986
1800	2,312,824	3,741,499

Conſiderable endeavours have been made to improve the manufactures of Ireland, but with little ſucceſs, except in the linen manufacture, which probably proceeds from the want of ſufficient capital, and from the facility with which Britiſh manufactures can be procured at a very ſmall additional expence; the latter will, therefore, for a long time, continue to conſtitute a large proportion of the imports of Ireland.

Value of Britiſh manufactures exported from Great Britain to Ireland.

In 1791	£ 1,470,972	In 1796	£ 1,781,789
1792	1,511,844	1797	1,310,996
1793	1,055,276	1798	1,657,954
1794	1,281,316	1799	2,405,999
1795	1,612,270	1800	1,787,966

The trade between Great Britain and *Ruſſia* has been conſidered highly beneficial to both countries; to Ruſſia in point of profit, and to Great Britain, as ſupplying articles eſſential to the ſupport of its navy. The capital employed muſt be much greater than formerly, from the increaſed value of the principal articles; and the balance of trade, which is conſiderably in favour of Ruſſia, is paid by means of the commercial tranſactions between Great Britain and other countries. The articles imported are iron, hemp, flax, tallow, pot-aſhes, deals, and lath-wood, coarſe linens, hog's briſtles, &c. The exports are principally broad-cloths and woollen ſtuffs, refined ſugar, cotton, lead, tin, iron and ſteel ware, earthen ware and glaſs, coals, alum, ſalt, horſes, London porter, with articles of leſs importance.

Years.	Imports.	Exports.
1800	£ 2,382,098	£ 1,025,335
1801	2,246,877	919,843
1802	2,182,430	1,376,399

The total number of veſſels that entered inwards from Ruſſia, and that cleared out for that country from Great Britain in three years, ending with 1806, was as follows:

	Inwards.		Outwards.	
Years.	Britiſh.	Foreign.	Britiſh.	Foreign.
1804	830	29	558	53
1805	961	14	927	52
1806	1106	21	677	32

The trade to *Denmark* and *Norway*, though of ancient date, is not of very great extent; the imports conſiſt chiefly of timber and corn; and the exports, of Weſt India produce and other foreign merchandize; the quantity of Britiſh manufactured goods which thoſe countries take being of ſmall amount.

Years.	Imports.	Exports.
1800	£ 241,563	£ 540,698
1801	208,794	416,475
1802	155,672	537,517

The total number of veſſels which entered inwards from Denmark and Norway, in the year 1806, was 1607, of which 529 were Britiſh ſhips: the total number which cleared outwards was 1690, of which 790 were Britiſh.

The trade with *Sweden*, which is carried on chiefly in ſhips of that country, has not varied materially in its extent during the laſt twenty years. The imports conſiſt chiefly of iron of a ſuperior quality, pitch, tar, deal boards, and ſail-cloth. The exports are principally colonial produce.

Years.	Imports.	Exports.
1800	£ 309,280	£ 78,840
1801	295,645	111,254
1802	327,350	108,296
1803	288,651	98,045

The total number of veſſels which entered inwards from Sweden, in the year 1806, was 353, of which 187 were Britiſh ſhips: the total number which cleared outwards was 362, of which 142 were Britiſh.

The imports from *Pruſſia*, conſiſt of all kinds of grain, hemp, flax, madder, lintſeed, gooſe-quills, briſtles, pearl-aſhes, mill-ſtones, and timber of various deſcriptions. The exports are chiefly alum, copperas, coals, beer, ſalt, wrought braſs and iron, lead, tin plates, earthen-ware, glaſs, woollen and cotton goods, ſome cotton yarn, India goods, raw and refined ſugar, drugs, dye-ſtuffs, pepper and other ſpices, coffee, rum, tobacco, &c.

Years.	Imports.	Exports.
1800	£ 1,340,904	£ 794,452
1801	1,387,149	660,739
1802	1,057,602	1,071,896
1803	831,225	1,916,502

The total number of veſſels which entered inwards from Pruſſia in the year 1805 was 1946, of which 837 were Britiſh ſhips: the total number which cleared outwards was 1627, of which only 482 were Britiſh. In 1806 the total numbers were much leſs, in conſequence of Pruſſia being involved in the war.

The trade with *Germany* had not experienced any conſiderable variation with reſpect to its extent, from the commencement of the laſt century, till on the extenſion of the war with France in 1794, it ſuddenly became the channel through which the principal part of the continent received the goods they had before obtained direct from Great Britain. The following account of exports to Germany ſhews the rapid increaſe of trade with that country during the war.

Years.	Britiſh Manufactures.	Foreign Merchandize.
1793	£ 718,474	£ 1,764,221
1794	1,634,530	4,308,695
1795	1,760,133	6,311,876
1796	1,591,810	6,582,179
1797	1,964,967	6,419,587
1798	2,042,774	8,646,691
1799	2,032,567	6,640,729
1800	4,364,120	8,300,470
1801	4,928,617	6,186,687

The total number of veſſels which entered inwards in the ſeveral ports of Great Britain from Germany (including Hamburgh) and which cleared outwards for that country, was as follows:

	Inwards.		Outwards.	
Years.	Britiſh.	Foreign.	Britiſh.	Foreign.
1793	217	54	292	77
1794	258	108	443	152
1795	259	222	257	406
1796	347	342	333	415
1797	237	257	314	371
1798	408	113	647	187
1799	409	126	426	181
1800	435	459	574	458

The total number of veſſels which entered inwards from Germany (including Hamburgh) in the year 1806 was 604; the total number which cleared outwards for that country 956.

The imports from *Holland* are butter and cheeſe in large quantities, geneva, juniper berries, flax, hemp, oak bark, rags, flower-roots and ſeeds, books, maps and prints. The exports are raw and refined ſugars, train oil, copperas, a few cotton goods, ſome woollen goods, coffee, rice, and foreign merchandize of various kinds: their amount, as follows:

Years.	Imports.	Exports.
1800	£ 972,600	£ 3,208,613
1801	1,025,958	3,496,744
1802	974,537	4,957,997
1803	630,403	1,565,355

The total number of veſſels which entered inwards from Holland in the year 1804 was 790, and the number which cleared outwards 521. The number which entered inwards in 1805, was 709; outwards 323; which, from the two countries being at war, were of courſe nearly all neutral veſſels.

France poſſeſſes ſuch natural advantages in the produce of its ſoil, and the convenience of its ſituation for procuring the commodities of all other countries, that while its manufactures were encouraged, and it retained poſſeſſions in the Eaſt and Weſt Indies, little inducement remained for commercial intercourſe with Great Britain, and even this limited traffic was much impeded by the high duties and prohibitions which mutual jealouſy had impoſed. In 1786 a more liberal ſyſtem was adopted by a treaty of commerce, in conſequence of which the trade between the two countries increaſed conſiderably. In the year 1792, the exports to France amounted to 1,228,166*l.* 3*s.* 9*d.* of which 743,280*l.* 12*s.* 1*d.* was Britiſh manufactures, and 484,885*l.* 11*s.* 8*d.* foreign merchandize. In the following year, the trade with France was ſuſpended by war, on the termination of which, in 1802, commiſſioners were appointed for adjuſting the conditions of a new commercial treaty, but its completion was prevented by the renewal of hoſtilities.

The trade with *Portugal* was formerly a very beneficial branch of our commerce, but has declined very much. The imports conſiſt chiefly of wine, cotton-wool, and indigo, with conſiderable ſums in caſh and bullion. The exports are almoſt wholly Britiſh produce and manufactures.

Years.	Imports.	Exports.
1798	£ 700,383	£ 750,918
1799	1,047,054	1,073,411
1800	916,848	1,011,893

The total number of veſſels which entered inwards from Portugal in the year 1800 was 340, of which 270 were Britiſh veſſels. The number which entered inwards in the year 1806 was 468; outwards 332.

The extent of the trade with *Spain*, previous to the war in 1796, will appear from the ſtatement of imports and exports.

Years.	Imports.	Exports.
1792	£ 897,840	£ 794,101
1793	485,872	476,726
1794	748,546	634,554
1795	992,853	437,830
1796	809,881	546,126

The year 1806 being a year of war, the trade with Spain was of courſe confined to neutral veſſels: the number which entered inwards was 222, and the number which cleared outwards 126.

The *Mediterranean trade* was ſubject to much interruption during the war which began in 1793, in conſequence of which many of the goods uſually imported from Venice and Italy were brought over-land through Switzerland and Germany to Hamburgh and Tonningen to be ſhipped for England. The Turkey and Levant trade was formerly one of the principal branches of Engliſh commerce, but it is now of much leſs importance. The chief articles imported, are cotton-wool, mohair, goats' hair, opium, ſenna, and other drugs, galls, madder, vallonea, and other dye-ſtuffs, currants, figs, raiſins, goat ſkins, and box-wood; raw ſilk was formerly a principal article, but very little is now brought from Turkey, that of Italy being much ſuperior. The exports conſiſt of lead, tin-plates, wrought and caſt iron, hardware, a conſiderable number of watches, ſome cotton goods, and a few woollen goods, India piece goods, coffee, ſugar, cinnamon, cloves, pimento and other ſpices. The extent of the different branches of the Mediterranean trade will appear from the following ſtatements.

Gibraltar and the Streights.

Years.	Imports.	Exports.	Ships inward.	Ships outward.
1799	£ 62,992	£ 358,784	47	56
1800	35,665	294,558	20	43
1801	24,887	362,971	19	54
1802	21,792	530,537	32	48
1803	23,112	487,699	17	48
1804	33,860	560,399	27	62
1805	42,919	183,824	19	59

In the year 1806, the number of veſſels which entered inwards was 24, outwards 83.

Italy.

Years.	Imports.	Exports.	Ships inward.	Ships outward.
1799	£ 224,607	£ 367,173	69	81
1800	411,765	587,530	115	113
1801	165,042	378,007	44	94
1802	804,329	2,048,784	127	248
1803	748,020	656,607	182	74
1804	268,029	359,854	76	126
1805	393,517	507,535	106	117

In the year 1806, the number of veſſels which entered inwards was 90, outwards 61.

Malta.

Years.	Imports.	Exports.	Ships inward.	Ships outward.
1801	£ 11,448	£ 88,735	10	14
1802	16,698	12,023	36	4
1803	8,922	133,629	22	15
1804	32,913	114,031	20	23
1805	9,304	127,515	6	12

In the year 1806, the number of veſſels which entered inwards was 26, outwards 26.

Minorca.

Years.	Imports.	Exports.	Ships inward.	Ships outward.
1800	£ 13,500	£ 12,246	19	5
1801	6,768	36,130	16	15
1802	22,106	21,478	25	5

In the year 1803, the trade with Minorca ceaſed, from its having been reſtored to Spain.

Turkey and Levant.

Years.	Imports.	Exports.	Ships inward.	Ships outward.
1799	£ 33,091	£ 226,078	3	13
1800	199,773	166,804	19	6
1801	141,137	172,198	9	10
1802	182,424	180,000	20	18
1803	175,427	155,369	27	9
1804	148,277	81,625	16	1
1805	103,590	135,411	22	8

In the year 1806, the number of veſſels which entered inwards was 23, outwards 3.

The articles imported from the coaſt of *Africa* into Great Britain are gum arabic, gum ſandarach, and ſenegal, camwood, red-wood, ebony, ivory, a few oſtrich feathers, and ſome ſkins; their amount in the year 1800 was 82,289*l.* 8*s.* 8*d.* The exports have hitherto been of far greater value, being principally intended for the purchaſe of ſlaves for the Weſt Indies. They conſiſted of bugles, cowries, ſpiritous liquors, a great number of guns and cutlaſſes, gunpowder, wrought braſs, copper and iron, glaſs, earthen ware, rice, groceries, apothecaries' ware, woollen, cotton, and linen goods, and large quantities of India piece goods. The total official value in the year 1800 was 1,017,365 *l.* 11 *s.* 5 *d.* of which 521,922 *l.* 19 *s.* 11 *d.* was Britiſh merchandize. The abolition of the infamous traffick in human beings, muſt cauſe a great revolution in the trade to this part of the world, as it appeared in the year 1789 that about 38,000 of the inhabitants of Africa were annually carried away in Britiſh ſhips for ſupplying the colonies with ſlaves, which of courſe employed a conſiderable number of veſſels. The number of ſhips that cleared out from Great Britain for Africa, in the year 1804, was 176.

The *Eaſt India* trade furniſhes a remarkable inſtance of an extenſive branch of commerce carried on ſucceſſively in the hands of an excluſive company, while moſt other commercial monopolies have made very ſmall profits, and generally ſoon expired. The trade to India, however, ſince the immenſe territorial acquiſitions of the Engliſh in that part, can no longer be conſidered as a mere commercial adventure, as it is now in a great meaſure a buſineſs of agency, for tranſmitting to Europe the fortunes acquired by Britiſh individuals in the Eaſt. The quantity of merchandize brought from thence, conſequently, greatly exceeds the value of the exports to India. The latter conſiſts chiefly of woollens, metals, and naval and military ſtores, the remaining articles being of trifling amount in compariſon, and almoſt wholly for the uſe of Europeans, as the natives are peculiarly attached to the uſe of their own produce and manufactures. The exports to China include a conſiderable amount in bullion, the other articles are woollen cloths and camblets, lead, and tin; the articles exported in private trade are, ſkins and furs, glaſs of various deſcriptions, jewellery, toys, and watches, cuttings of cloth, a very few woollens, ſome cutlery and hard ware, and ſilver. The amount of the company's exports to India and China, will appear from the following ſtatements.

INDIA.

Seaſon.	Merchandize, or Manufacture.	Metals.	Stores.
1781	£ 200,808	£ 157,614	£ 163,878
1782	123,834	183,356	133,773
1783	95,251	122,855	77,237
1784	92,205	93,806	55,256
1785	74,683	80,152	104,226
1786	122,709	97,899	85,179
1787	108,388	157,194	153,603
1788	119,449	99,028	152,587
1789	80,184	273,104	100,435
1790	75,141	191,944	120,525
1791	86,680	124,889	108,560

CHINA.

Seaſon.	Merchandize, or Manufacture.	Metals.	Stores.	Bullion.
1781	£ 129,179	£ 10,349	£ 2,206	£ ——
1782	94,992	9,416	1,717	——
1783	113,763	4,579	1,743	——
1784	146,741	27,835	2,904	——
1785	224,612	37,989	7,503	724,317
1786	202,023	35,535	6,972	749,833
1787	323,107	38,046	7,289	646,798
1788	335,392	59,208	6,598	489,192
1789	354,717	107,995	7,769	787,078
1790	431,385	105,707	4,081	532,705
1791	486,993	99,448	4,000	422,098

The imports from the Eaſt Indies conſiſt of Bengal piece-goods, coaſt and Surat piece-goods, Bengal and China raw-ſilk, tea, pepper, ſaltpetre, nankeen cloth, china, wrought ſilks, a ſmall quantity of china-ware, ſugar, coffee, indigo, and various drugs. The total amount of the imports, on the company's account, and in private trade, according to the official rates of the inſpector-general's office, was as follows:

Years.	Import.	Years.	Import.
1781	£ 2,526,339	1793	£ 3,499,023
1782	626,319	1794	4,458,475
1783	1,301,495	1795	5,760,810
1784	2,996,652	1796	3,372,689
1785	2,703,940	1797	3,942,384
1786	3,156,687	1798	7,626,930
1787	3,430,868	1799	4,284,805
1788	3,453,897	1800	4,942,275
1789	3,362,545	1801	5,424,441
1790	3,149,870	1802	5,794,906
1791	3,698,713	1803	6,348,887
1792	2,701,547	1804	5,214,621

But a more accurate idea of the real value of the imports from the Eaſt Indies, may be formed from the annual amount of the company's ſales, which was

In 1801	£ 7,595,181	In 1803	£ 6,042,526
1802	6,626,347	1804	5,866,073

The *Weſt India* trade is, in ſome reſpects, the moſt important branch of the commerce of Great Britain; as on the colonial produce which it ſupplies, much of the trade with different parts of Europe chiefly depends. The value of the Britiſh Weſt India produce from the old iſlands, imported into Great Britain, on a medium of four years, preceding the 5th of January 1796, according to the current prices during that period, was eſtimated, excluſive of the duties, at about 6,800,000 *l.* per annum. This ſum is not wholly a return for goods exported, a part of it muſt be conſidered as remittances of the property of perſons who poſſeſs eſtates in the Weſt Indies; but who are wholly or occaſionally reſident in England; and of perſons who have lent money on mortgage or otherwiſe in the Weſt Indies, and receive their intereſt from the ſale of the produce.

Official Value of Imports from the Weſt Indies.

Years.	Britiſh. Weſt Indies.	Conquered Iſlands.	Total.
1801	£ 6,759,617	£ 4,105,839	£ 10,865,456
1802	7,293,316	2,699,504	9,992,820
1803	5,786,432	362,014	6,148,436

The value of the Britiſh Weſt India iſlands, in a commercial view, will be very conſpicuous from the following ſtatement of the total quantities of ſugar, rum, coffee, and cotton-wool, exported from them.

Years.

Years.	Sugar. Cwt.	Rum. Galls.	Coffee. Cwt.	Cotton Wool. lbs.
1793	2,129,750	4,937,051	92,016	9 173,583
1794	2,141,921	5,597,520	141,007	8,473,175
1795	1,743,939	4,173,734	144,800	11.675,495
1796	1,816,584	5,567,754	94,086	8,854,413
1797	1,636,681	4,279,164	114,947	6,918,153
1798	2,015,602	6,224,076	165,075	7,909,832
1799	2,628.470	6,270,449	132,259	7,529,881
1800	2,413.997	6.231,225	180,374	10,611.349
1801	2,959,958	8,148,571	199,359	11,261,014
1802	3,463,366	8,676,381	230,148	8,799,891
1803	2,836,479	8,781,496	173,883	5,650,615

The total number of veſſels which entered inwards from the Weſt Indies, in the year 1804, was 721, containing 204,411 tons, and navigated by 12,119 ſeamen. The number of veſſels which cleared outwards was 790. The value of Britiſh produce and manufactures exported to the Britiſh plantations in the Weſt Indies, excluſive of the Conquered iſlands, was 3,408,232 *l.*

The trade with the United States of *America*, has rapidly advanced to very conſiderable importance; and Great Britain now ſupplies them with commodities to a far greater amount, than in the moſt favourable years previous to their independence, although the number of Britiſh ſhips employed is conſiderably leſs. In the year 1789 the number of Britiſh veſſels which entered inwards in this trade was 253, the number outwards 358; in the year 1799, the number which entered inwards was only 42, the number outwards 57.

Years.	Imports.	Exports.
1798	£ 1,782 720	£ 5.580,370
1799	1,818 941	7,056,558
1800	2,357,922	6,885,507

The total number of veſſels which entered inwards from the United States, in the year 1806, was 561, of which 53 were Britiſh; the total number which cleared outwards was 575, of which only 39 were Britiſh.

The remaining poſſeſſions of Britain in North America, being countries not very fertile or fully inhabited, the trade with them is not of very great extent. The following ſtatement of the exports to thoſe parts in the year 1800, will, however, ſhew that the trade is well worth preſerving, independent of the conſideration that it is the means of procuring articles of much importance in other branches of commerce.

To Hudſons bay - -	£	38,061	0	9
Newfoundland - -		219.458	5	11
Canada - - - - -		460,155	13	3
New Brunſwick - -		81,230	15	4
Nova Scotia - - -		177,083	17	10
Total	£	975,989	13	1

With reſpect to the general balance of trade, or the ultimate profit which Great Britain derives from its commerce with all other countries, Mr. Irving, the inſpector-general of imports and exports, to whom the public have, for many years, been indebted for the judicious arrangement and explanation of the official documents relating to foreign trade, has juſtly remarked, that there are perhaps few queſtions to which the human attention can be directed more difficult to form an opinion upon, from the variety of conſiderations, and the vaſt ſtatements with which it is connected, and alſo from the materials on which concluſions are to be formed, being in ſome inſtances defective; he has, however, ſtated it as his opinion, that the balance of trade in favour of Great Britain, according to the true value of the goods exported and imported, amounted on a medium of the four years preceding 1796, to upwards of 6,500,000 *l.* per annum, excluſive of the profits derived from the Eaſt and Weſt India trades, which he eſtimated at upwards of 400,000 *l.* per annum; and excluſive of the profits derived from the fiſheries.

An accurate view of the progreſs and extent of commerce in all the European ſtates, would furniſh much information; but with reſpect to ſeveral, no authentic particulars of this kind have been made public, and the foreign trade of others has been ſo entirely turned out of its uſual channels ſince the commencement of the war of the French revolution, that any account of its preſent ſtate would be very incomplete and unſatisfactory.

With reſpect to domeſtic commerce, we may obſerve, that the king is the arbiter of it; as it pertains to his prerogative to eſtabliſh public marts, as markets and fairs. to regulate weights and meaſures, and to give money, which is the univerſal medium of commerce, authority and currency.

A great part of the foreign commerce of England is now carried on by collective companies: ſome incorporated by the king's charters, with an excluſive privilege, as the Eaſt India company; others only private aſſociations, as the Turkey and Hamburgh companies. See COMPANY.

COMMERCE, *Chambers of.* See CHAMBER.

COMMERCE, *Characters in.* See CHARACTER.

COMMERCY, in *Geography*, a handſome town of France, and chief place of a diſtrict in the department of Meuſe, on the weſtern ſhore of that river. E. long. 5° 24'. N. lat. 48° 20'. It has a ſub prefect, and counts 3418 inhabitants. The diſtrict contains 181 communes, with a population of 73,103 individuals. There are ſeveral iron forges, paper mills, glue, violin, and linen manufactures.

COMMERSONA, in *Botany*. Sonnerat. See BARRINGTONIA.

COMMERSONIA, (ſo named by Forſter, in memory of M. Commerſon, the celebrated French naturaliſt and traveller.) Forſt. Gen. 22. Linn. jun. Supp. 26. Schreb. 535. Willd. 596. Lam. Ill. 550. Gært. 586. Juſſ. 428. Vent. 4. 17. Claſs and order, *pentandria pentagynia*. Nat. Ord. Undetermined; Juſſ. Vent.

Gen. Ch. *Cal.* one-leafed, five-cleft, bearing the petals between the ſegments; ſegments egg-ſhaped, acute, longer and broader than the petals. *Cor.* Petals five, dilated at the baſe on each ſide, with an inflexed lobe, ſpreading. *Stam.* Filaments very ſhort, ſituated at the baſe of the petals; anthers roundiſh, didymous. *Nectary* a five-cleft ring, between the petals and the germ, with five filiform villous ſmall bodies between the diviſions; diviſions lanceolate, erect, ſhorter than the petals. *Piſt.* Germ ſuperior, globular, villous, with five projections; ſtyles five, filiform, approximating, ſhort. *Per.* Capſule roundiſh, hard, echinate with long ſoft briſtle-ſhaped hairs, five-celled; two ſeeds in each cell. *Seeds* egg-ſhaped.

Eſſ. Ch. Calyx one-leafed, bearing the corolla. Petals five. Nectary five-cleft. Capſule five-celled, echinate.

Sp. C. *echinata.* Linn. jun. Supp. 26. Mart. Lam. Willd. Gært. tab. 94. Lam. Ill. tab. 218. (Reſtiaria; Rumph. Amb. 3. 187. tab. 119.) A middle-ſized tree. *Trunk* rarely the bulk of a man, with a diffuſe head and ſmooth bark, eaſily ſeparable from the wood; young branches woolly. *Leaves* alternate, petioled, obliquely egg-ſhaped, acuminate, ſerrated, a little wrinkled, ſhining, dark green above, hoary underneath. *Flowers* very ſmall, white, in axillary panicles. *Capſule* ſomewhat globular, with a coriaceous echinate rind, five-coccous, five-valved; cocci inverſely egg-ſhaped, narrowing downwards, ſemibilocular from the back, two-valved; valves of the contiguous cocci united and forming the proper partitions of the capſule. *Seeds* two in each cell, attached to the central angle of the cells, ovate-oblong, a little thicker upwards, ſlightly compreſſed, of a red-ferruginous colour, blackiſh at the top, incompleatly arilled; aril membranous, very thin, whitiſh, lacerated, fixed to the umbilicus of the ſeed, covering its whole ventral, but not its dorſal part. Gært. A native of Otaheite, the Friendly Iſles, and the Moluccas.

COMMIA, Boſc. Nouv. Dict. Claſs and order, *diœcia monandria*.

Gen. Ch. *Male catkins*. *Scales* obtuſe, each concealing a ſingle ſtamen. *Female catkins*. *Calyx proper* three-leaved; leaves acute, permanent. *Cor.* none. *Piſt.* Germ ſuperior; ſtyles three, ſhort; ſtigma thick. *Peric.* Capſule three-lobed, three-celled. *Seeds* one in each cell.

A tree. *Leaves* alternate, lanceolate, quite entire, ſmooth, recurved. *Flowers* in axillary and terminal catkins. A native of Cochin-china. A white gum exudes abundantly from its bark, which is ſometimes uſed as a medicine in dropſies and obſtructions, but is too violent in its effects to be taken without great caution.

COMMINATORY, a clauſe inſerted in a law, edict, patent, &c. importing a puniſhment wherewith delinquents are menaced; which, however, is not to be executed in its rigour.

Thus, in France, when an exile is enjoined not to return on pain of death, it is deemed a *comminatory* penalty; ſince, if he do return, it is not ſtrictly executed; but a ſecond injunction is then laid on him, which is more than comminatory, and from the day of the date thereof, imports death without remedy.

COMMINES, Philip de, in *Biography*, a celebrated hiſtorian, was born of a noble family in Flanders in 1445. He ſpent the early part of his life in the court of Charles the Bold, duke of Burgundy; but in 1472 he went over to the ſervice of Louis XI. king of France, who adopted him as a favourite, and employed him in various important negociations. He married an heireſs of the houſe of Anjou, by whom he acquired conſiderable landed property. He accompanied his ſovereign in many of his journies and in ſome expeditions of a more ſerious nature; and he attended upon his ſucceſſor Charles VIII. to the conqueſt of Naples. Under this prince he was accuſed of having eſpouſed the cauſe of the duke of Orleans, for which he was arreſted, and impriſoned in an iron cage for eight months. He was afterwards transferred to a priſon at Paris, where he was eighteen months without being able to obtain a trial. Commines was at length honourably acquitted, but it does not appear that, either in the remainder of this reign, or in that of the duke of Orleans who ſucceeded, and for whom he had ſuffered, he was afterwards publicly employed. He died, at his ſeat of Argenton, in Poitou, of which he had been denominated the lord. Commines poſſeſſed various qualities well adapted to render him eminent as a ſtateſman. He had a fine perſon, and an excellent underſtanding: he was a complete maſter of many modern languages, and had ſo great a command of his own powers that he could dictate to four ſecretaries at once. As a literary character he is chiefly known for his "Memoirs," which contain an account of the principal events of the reigns of Louis XI. and Charles VIII. during a period of thirty-four years. This work is highly eſteemed on account of the perſonal knowledge and obſervation of the author, who united a ſincere and candid diſpoſition, with a ſimple and unaffected ſtyle. By the learned Lipſius, Commines is regarded as equal to the hiſtorians of antiquity; his "Memoirs" he recommends as the vade mecum of princes. They have gone through many editions, which have been illuſtrated with notes by different learned men; but the moſt eſteemed impreſſion is that of the abbé Lenglet du Freſnoy, 1747, in 4 vols. 4to. printed at Paris, with London in the title page. Nouv. Dict. Hiſt. Du Freſnoi.

COMMINGES, in *Geography*, (in Latin *Convenæ*,) was before the French revolution of 1789, a county in the province of Gaſcony, and forms now part of the department of Haute-Garonne in France.

COMMINUTION, the act of grinding, or breaking any matter into ſmaller particles.—The effect of chewing, or maſticating our food, is the *comminution* thereof.

COMMIRE, John, in *Biography*, a Jeſuit, was born in 1625 at Amboiſe, where his father kept a tennis-court. He received a good education, and applied himſelf chiefly to claſſical literature. He acquired great reputation as a poet, by a collection of pieces in Latin which appeared in 1678, but he was, at the ſame time, diligent in his profeſſion, as a teacher and director in theology. His poems conſiſt of paraphraſes on various parts of the ſcriptures, odes, fables, epigrams, &c. of which the general character is facility, copiouſneſs, and amenity. He is thought to have ſucceeded beſt in his odes, but his fables are in high repute. He died at Paris in 1702, leaving behind him the character of an open and upright diſpoſition. An edition of his poems was publiſhed in 2 vols. 12mo. in the year 1754. Nouv. Dict. Hiſt.

COMMIS, Fr. A clerk, deputy, or ſubordinate perſon, who is employed in any of the war-departments of the French.

Commis *general du parc des vivres*; commis-general of the proviſion-park. This officer exerciſes his functions under the orders of the director-general of proviſions. His employment requires a good deal of capacity and zeal, as well as of probity. His duties and relations are multifarious and extenſive. He ſhould always encamp in the centre of the baggage, to be able to have an eye to the whole, and to be leſs interrupted.

Commis *General des travaux du parc des vivres*, commiſ-general of labour and work in the proviſion-park. The duties of this employment are troubleſome, and require much attention. It ſhould never be beſtowed on a man that does not poſſeſs experience, prudence, and firmneſs, without being too rigorous or ſevere, as he has authority over every thing connected with the different kinds of work in the park.

Commis *des entrepreneurs pour la fourniture des lits*; clerks of undertakers for the furniſhing of beds. They have a right to viſit and examine the beds and every thing connected with them, and to refuſe or reject whatever is inſufficient or defective.

Commis *du treſorier de l'extraordinaire des guerres*, clerks of the treaſurer of the wars, or of the paymaſter general of the army. They deliver the certificates to the troops who leave lodgings or quarters. They were under the juriſdiction of the high conſtable.

COMMISERATION, in *Pathology* and *Ethics*, is frequently uſed as ſynonymous with *compaſſion*, which ſee; but, in its general uſe, it is ſomewhat different. It is always preferred, when we wiſh to expreſs our ſympathy for misfortunes, which it is not in our power to remove, or for which there is no apparent remedy. Commiſeration, ruminating upon the ſtate and ſuffering of others, induces a permanent concern. In ſuch caſes it may be ſaid, that we commiſerate the unfortunate ſufferer, rather than that we have compaſſion upon him. But although this is a more helpleſs, it is not an uſeleſs affection. It ſooths the mind of the afflicted, and greatly alleviates their ſorrows, when every other conſolation fails. *Condolence* is the expreſſion of our commiſeration. Cogan on the Paſſions, p. 134.

COMMISSAIRE, Fr. *Commiſſary*. This word or term was uſed in the old French ſervice, to expreſs a variety of occupations, and was annexed to a good many different appellations, of which the following are the principal.

Commissaire *General des Guerres ou commiſſaire General des Armées*, commiſſary general of the wars. This charge, office, or appointment, was created for *Beſançon*, in 1637, and did not long exiſt, being ſuppreſſed in his perſon, becauſe it gave too much authority, and too many privileges, to the perſon inveſted with it.

Commissaire *Général de la Cavalerie légère*. Fr. He was the third general officer of all the regiments of cavalry, and he had a regiment of his own under the name of the regiment of the *commiſſaire général*, or commiſſary general.

Commissaire *Ordonnateur des Guerres*. This appointment was ſuperior to that of an ordinary or provincial commiſſary of war. It was commonly a ſort of recompence and advancement granted in conſideration of ſervices rendered by the one or the other commiſſaries of war, whether of the armies or in the interior of the ſtate. The *commiſſaire ordonnateur* is charged with objects of the firſt importance, and with a greater variety of them than the other commiſſaries are.

Commissaires *des Guerres*, commiſſaries of the wars, or muſter-maſters general. They enjoyed peculiar privileges, but were ſubordinate to the governors and commandants of towns and garriſons, without whoſe permiſſion they could not muſter any regiment.

Commissaires *Ordinaires des Guerres*, ordinary commiſſaries of the wars, or deputy-muſter maſters. Officers ſubordinate to the immediately preceding, who ought to aſſiſt at reviews, who are charged with the conduct, police, and diſcipline of troops, and with making the men obſerve the military decrees. With the army, they have the detail of the hoſpitals, bread, victuals, &c. &c. They make inventories of proviſions, and are charged with the management of convoys. Their creation is very ancient: for there is mention made of them under the reign of king Jean I. in 1355. They were called at firſt *conducteurs des gens de guerre*, (conductors of the people of war, or of military people) a title or appellation which they enjoyed for a long time under Louis XIII., and they are ſtill called ſo in their commiſſions. Thoſe who were not gentlemen, had the right of taking the rank of ſquire, or eſquire; of enjoying all the privileges of the nobleſſe, and of acquiring noble fiefs.

Commissaire *Provincial des Guerres*, provincial commiſſary of the wars. There were no *commiſſaires provinciaux des guerres* before the year 1635. They were afterwards ſuppreſſed, and were re-eſtabliſhed in 1704, under Louis XIV., with the ſame privileges, rights, attributions, and authorities for the ſervice of cities of war, that the ordinary commiſſaries of the wars enjoyed for the ſervice of marches, and of the armies.

Commissaire *General des Vivres*, commiſſary general of proviſions. This officer has under him ſeveral other commiſſaries, who ought to know the number of men, which each of them will have to ſubſiſt, in order to make choice of a proper place for cauſing the proviſions to be brought to, as alſo to form magazines for the duration of the campaign, and of courſe to procure a ſufficient number of bakers and workmen.

Commissaire *d'Artillerie*, commiſſary of artillery. There is one ſuch officer in each department of the ordnance, who keeps one of the three keys that belong to the artillery-magazine. It is at his requiſition that the governor or commandant of a place ſends ſoldiers to remove, when neceſſary, the pieces of artillery and ſtores of war. He has the ſuperintendance and direction of every thing connected with the cleanlineſs and general management of the magazines.

Commissaires *provinciaux d'Artillerie*, provincial commiſſaries of artillery. Theſe were of two ſorts or deſcriptions. The one had the names or titles of the provinces; the other had merely the title of provincial. But on ſervice, they both received the ſame pay.

Commissaires *ordinaires d'Artillerie*, ordinary commiſſaries of artillery. Theſe were ſubordinate to the provincial commiſſaries, and were diſtributed among the forts, garriſoned towns, navy, and dockyards.

Commissaires *extraordinaires d'Artillerie*, extraordinary commiſſaries of artillery. Under the monarchy of France, theſe formed the third of ordnance-commiſſaries, and they were in like manner diſtributed on duty in garriſoned places, and on board ſhips of war.

Commissaire *provincial en l'Arſenal de Paris, ax department de l'Iſle de France*, provincial commiſſary in the arſenal of Paris, in the department of the iſle of France. This officer received his commiſſion from the grand maſter, in whoſe gift it was, and poſſeſſed the excluſive privilege of being made privy to every alteration or movement that took place in the arſenal.

Commissaire *General des Poudres et Saltpetres*, commiſſary general of gun-powder and ſaltpetre. This appointment was created in 1634, with that of ſuperintendant general of gun-powder and ſaltpetre. It was at laſt ſuppreſſed, and the grand maſter of the ordnance appointed a perſon to exerciſe its functions.

Commissaire *General des Fontes*, commiſſary general of the founderies. This appointment was the gift of the maſter of the ordnance, and was invariably beſtowed on thoſe who had given convincing proofs of their abilities and ſkill in the caſting of cannon, &c.

Commissaires *des Guerres entretenus dans l'Hotel des Invalides*, commiſſaries of war kept in the *hotel des invalides*. It was a principal part of their duty to keep a regular roll or liſt of all the names of the different officers, non-commiſſioned officers, and ſoldiers, that might be detached on garriſon duty, &c. from which they made a monthly return to the ſecretary at war. Each commiſſary, at every review or inſpection of the corps of invalids, had particular directions to mark and point out thoſe men who appeared to be capable of ſerving, of whom a regular return was made to the ſecretary at war.

Commissaire *General des Fortifications*, commiſſary general of fortifications. This was an office of great importance, as it was his duty to give the plans for places and new works; to approve or condemn thoſe that had been ordered by others; to viſit the fortified places of the kingdom; to order the reparation of works that had been damaged; to regulate the conduct of the engineers, and to give them orders for the good of the ſervice.

At a ſiege, he directed the tracing out of the lines of circumvallation and countervallation, and the ſecuring of the poſts; he decided on attacks which were made according to his plan; he directed the making of lodgments, ſaps, mines, the traverſe of the ditch, the attack of the breach, and after the place was taken, cauſed it to be repaired. In defending a place, he had the ſame or equal power. His appointments amounted to about 30,000 livres per annum.

COMMISSARY, in *Military Language* of Britain, has various denominations, though he is generally a civil officer appointed to inſpect the muſters, ſtores, and proviſions for the army. The number of ſuch officers is not limited in time of war.

Commiſſaries *general*, and commiſſaries *of accounts*, in our ſervice, are appointed by warrant under the king's ſign manual, directing them to obey all inſtructions given to them for the execution of their duty by the lords commiſſioners of the treaſury. Theſe inſtructions are generally prepared by the comptrollers of the army-accounts, under the orders of the treaſury, and ſubject to its ſubſequent inſpection.

Commissary *General of the Muſters*, or *Muſter-maſter general.* This officer takes an account of the ſtrength of every regiment as often as he pleaſes; reviews them; ſees that the horſe are well mounted, and that all the men are well armed and clothed. He receives and inſpects the muſter-rolls, and thereby knows exactly the ſtrength of the army. A new officer has been appointed under the appellation of *Inſpector-general of Cavalry*, who performs the duties in that reſpect, which uſed to be performed by the muſter-maſter general.

Commissary *General of Stores.* A civil officer who has charge of ordnance ſtores, for which he is accountable to the office of ordnance. He has other commiſſaries under him, as well as clerks and conductors, particularly in time of war.

Commissary *of the Train-horſes.* A civil officer of the ordnance, who has the inſpection of all horſes belonging to the train of artillery, the hoſpital, and the bakery. He has a number of conductors, drivers, &c. under him.

Commissary *of Accounts.* A perſon of reſponſibility, who, with a proper eſtabliſhment, attends each army, ſufficiently large and numerous to render it neceſſary for the purpoſe of taking, examining, and controlling accounts on the ſpot. All ſuch commiſſaries make returns of their examinations, on which, as documents, the comptrollers of the army-accounts ground their inquiries into that branch of the public expenditure.

Commissary *General of Proviſions.* An officer who is charged with furniſhing the army in the field and on ſervice, with all ſorts of proviſions; forage, &c. generally by contract, and ſometimes otherwiſe. He has a variety of commiſſaries, ſtore-keepers, clerks, &c. under him.

Commissary, in the *Eccleſiaſtical Law*, an officer of the biſhop, who exerciſes eccleſiaſtical juriſdiction in thoſe parts of the dioceſe, which are ſo remote from the ſee, that the chancellor cannot call the ſubjects thereof to the biſhop's principal conſiſtory, without their too great moleſtation.

This officer, called by the canoniſts *commiſſarius*, or *officialis foraneus*, is appointed to ſupply the biſhop's office in the out-parts of the dioceſe, and in ſuch parts as are peculiar to the biſhop, and exempted from the juriſdiction of the archdeacon: for where the archdeacons have juriſdiction, as in moſt places they have, either by preſcription or compoſition, the commiſſary is ſuperfluous, and frequently vexatious, and ought not to be: yet in ſuch caſes, a commiſſary is ſometimes appointed by the biſhop, and takes preſtation-money of the archdeacon yearly *pro exteriori juriſdictione*, as it is ordinarily called. But this is held to be a wrong to archdeacons and the poorer ſort of people. Cowel's Interp. 4 Inſt. 338.

Commissary *Court*, in *Scots Jurisprudence.* At the reformation, all epiſcopal juriſdiction exerciſed under the authority of the biſhop of Rome was aboliſhed; and the courſe of juſtice in conſiſtorial cauſes was thus ſtopped. Hence queen Mary, beſides naming a commiſſary for every dioceſe, did, by a ſpecial grant, eſtabliſh a new *commiſſary-court* at Edinburgh, conſiſting of four judges or commiſſaries. This court is veſted with a double juriſdiction; one dioceſan, which is exerciſed in the ſpecial territory contained in the grant, *viz.* the counties of Edinburgh, Haddington, Linlithgow, Peebles, and a great part of Stirlingſhire; and another univerſal, by which the judges confirm the teſtaments of all who die in foreign parts, and may reduce the decrees of all inferior commiſſaries, provided the reduction be purſued within a year after the decree. Biſhops, upon their re-eſtabliſhment in the reign of James VI., were reſtored to the right of naming their ſeveral commiſſaries. The commiſſaries retain to this day an excluſive power of judging in declarations of marriage, and of the nullity of marriage; in actions of divorce and of non-adherence, of adultery, baſtardy, and confirmation of teſtaments; becauſe all theſe matters are ſtill conſidered to be properly conſiſtorial. Inferior commiſſaries are not competent to queſtions of divorce, under which are comprehended queſtions of baſtardy and adherence, when they have a connection with the lawfulneſs of marriage, or with adultery. Commiſſaries have now no power to pronounce decrees in abſence for any ſum above 40*l.* Scots, except in cauſes purely conſiſtorial; but they may authenticate tutorial and curatorial inventories: and all bonds, contracts, &c. which contain a clauſe for regiſtration in the books of any judge competent, and proteſts on bills, may be regiſtered in their books.

COMMISSION, in *Common Law*, is the ſame with *delegatio* among the civilians; and is taken for the warrant, or letters-patent, which all perſons exerciſing juriſdiction, either ordinary or extraordinary, have to authoriſe them to hear or determine any cauſe or action: ſuch as the commiſſion of judges, &c.

The term, however, is ſometimes extended farther than to matters of judgment; as in the commiſſion of purveyors, which ſeems to be null by the ſtatute for taking away purveyance, 12 Car. II. and the high commiſſion court, which was founded on the ſtatute 1 Eliz. and is alſo aboliſhed by act of parliament 16 Car. I. The perſons charged with a commiſſion are hence called *commiſſioners*; ſometimes *committees.*

Commiſſions of inquiry ſhall be made to the juſtices of one bench or the other, &c., and to do lawful things are grantable in many caſes. Moſt of the great officers, judicial and miniſterial, of the realm, are made by commiſſion. And by ſuch commiſſions, treaſons, felonies, and other offences, may be heard and determined; by this method, likewiſe, oaths, cognizances of fines, and anſwers, are taken, witneſſes examined, offices found, &c. Bro Ab. 12. Rep. 39. See ſtat. 42 E. III. c. 4. Moſt of theſe commiſſions are appointed by the king under the great ſeal of England; but a commiſſion under the grand ſeal may be determined by a privy ſeal; and by granting another new commiſſion to do the ſame thing, the former commiſſion determines; and on the death or demiſe of the king, the commiſſions of judges and officers generally ceaſe. Bro. Commiſ. 2 Dyer 289.

Commission *of Anticipation*, was anciently a commiſſion given under the great-ſeal, to collect a tax or ſubſidy before the day. 15 Hen. VIII.

Commission *of Array.* See Militia.

Commission *of Aſſociation*, is a commiſſion under the great ſeal to aſſociate two, or more learned perſons, with the ſeveral juſtices, in the ſeveral circuits and counties in Wales.

Commission *of Bankruptcy*, a commiſſion under the great ſeal, directed to five or more commiſſioners, to enquire into the particulars of a man's circumſtances, who hath failed, or broke; and to act according to certain ſtatutes made in that behalf. See Bankrupt, and Petition *of Bankruptcy*.

Commissions *of Charitable Uſes* go out of the chancery to the biſhop and others, where any lands given to charitable uſes are miſemployed, or there are any fraud or diſputes concerning them, to enquire of and redreſs the abuſe, &c. 43 Eliz. cap. 4.

Commission *of Delegates*, a commiſſion under the great ſeal to certain perſons, uſually two or three temporal lords, as many biſhops, and two judges of the law, to ſit upon an appeal to the king in the court of chancery, where any ſentence is given in any eccleſiaſtical cauſe by the archbiſhop. Stat. 25 Hen. VIII. c. 19. Now generally three of the common law judges and two civilians ſit as judges. See Court and Delegates.

Commission *to enquire of faults againſt the law*, an ancient commiſſion ſet forth on extraordinary occaſions and corruptions.

Commission *of Lunacy*, a commiſſion out of chancery to enquire whether a perſon repreſented to be lunatic, be ſo or not; that, if lunatic, the king may have the care of his eſtate, &c. 17 Edw. II. c. 10.

Commission *of Peace*. See Justice *of Peace*.

Commission *of Rebellion*, or *Writ of Rebellion*, is iſſued out when a man, after proclamation made by the ſheriff upon a proceſs out of the chancery, to preſent himſelf, under pain of his allegiance, to the court by a certain day, does not appear. See Rebellion.

This commiſſion is directed by way of command to certain perſons; three, two, or one of them; to apprehend, or cauſe to be apprehended, the party as a rebel; and to bring him to the court on a day aſſigned.

This writ or commiſſion goes forth after an attachment returned, *non eſt inventus*, &c.

Commission *of Sewers*, is directed to certain perſons to ſee drains and ditches well kept, and maintained, in the marſhy and fenny parts of England, for the better conveyance of water into the ſea, and preſerving the graſs upon the land. Stat. 23 Hen. VIII. c. 5. 13 Eliz. c. 9. The ſtat. 3 Jac. I. c. 14. ordains, that all ditches, water-courſes, &c. within two miles of London, falling into the Thames, ſhall be ſubject to the commiſſion of ſewers; and the lord-mayor, &c. is to appoint perſons who have this power. 7 Ann. c. 10.

Commission *to examine witneſſes*, is ſometimes appointed by the court of equity in caſes that require it, as when the cauſe ariſes in a foreign country, and the witneſſes are at home, or when the witneſſes are abroad, or ſoon to leave the kingdom; or again, when they are aged and infirm. This commiſſion is empowered to exerciſe the ſame juriſdiction as would have been exerciſed if the witneſſes had attended. See Suit.

Commission *of Treaty with Foreign Princes*, is where leagues and treaties are made and tranſacted, between ſtates and kingdoms, by their ambaſſadors and miniſters, for the mutual advantage of the kingdoms in alliance.

Commission *to take up Men for War*, was a commiſſion to preſs or force men into the king's ſervice. This power of impreſſing has been heretofore doubted; but the legality of it is now fully eſtabliſhed. Foſt. Rep. 154. Blackſt. Com. p. 419. Cowp. 517. See Impressing.

Commission, *Militaire*. A brevet, or power, granted in writing by the miniſter of war in the name of the ſovereign, and ſealed with the great ſeal, by which he, to whom it is given, exerciſes the military charge entruſted to him, and takes his rank from the day of the date thereof. Commiſſion in a military ſenſe, in our ſervice, denotes any ſituation or place, which an individual may hold in the regular army, militia, or volunteers. All commiſſions in the line, guards, or volunteer-corps, muſt have the royal ſign manual. Commiſſions however in the militia do not bear the royal ſign manual, except that of the adjutant, who is commonly called a king's officer. The lieutenants or deputy-lieutenants of counties affix their ſeals and ſignatures to militia-commiſſions after they have been laid before the king for his approbation. Fourteen days conſtitute the time allotted for the royal approbation or diſapprobation. And if his majeſty does not within that time *diſapprove* of the perſon ſo recommended, a notification of his pleaſure and acquieſcence is ſent by one of the principal ſecretaries of ſtate to the lord lieutenant or to thoſe acting by commiſſion in his abſence.

Commission *Militaire* is alſo a momentary or temporary tribunal appointed or ordered to ſit for the trial of military crimes and offences. When judgment is pronounced and the duty is performed, for which it was appointed, its authority, as well as its exiſtence, ceaſes.

Commissions *of Array*. Commiſſions iſſued to experienced officers to draw out and array the fitteſt men in each county for ſervice, and to march them to the ſea coaſts, or to ſuch other parts of the county as were thought to be moſt in danger. There were hundreds of ſuch commiſſions between the 36th of Henry III., and the reign of Edward IV. The form of one is to be ſeen in "Ruſhworth's Hiſtorical Collection," publiſhed in 1640. Such commiſſions were attempted to be revived by Charles I.; but they were voted illegal and unconſtitutional by the parliament.

Non-commiſſioned is a term commonly employed to denote a claſs of men, who ſtand between the rank and file of a battalion, and the commiſſioned and warrant officers, as ſerjeants-major, ſerjeants for inſtance.

Commission-*Officers*. See Officer.

Commissions, *Book of*. See Book.

Commission, in *Commerce*. See Factorage.

COMMISSIONER, he who has a *commiſſion*, *e. gr.* a patent, or other legal warrant, to execute any public office. See Warrant, &c.

Such are, *commiſſioners* of hawkers and pedlars, *commiſſioners* of alienation, *commiſſioners* of the ſtamps, &c.

Commissioners *of Public Accounts*. See Accounts.

Commissioners *of the Cuſtoms*. See Custom-*houſe*.

Commissioners *of the Dock-yards*. See Dock-*yards*.

Commissioners *of Exciſe*. See Excise.

Commissioners *of the Navy*. See Navy.

Commissioners, *Lords, of the Treaſury*. See Treasury, and Exchequer.

Commissioners *of Trade*, &c. See Board.

COMMISSUM *Fidei*. See Fidei.

COMMISSURE, Commissura, a term uſed by ſome authors for the junctures, or for the ſmall interſtices of bodies; or the little clefts between the particles; eſpecially when thoſe particles are broadiſh or flat, and lie contiguous to one another, like thin plates, or *lamellæ*.

The word literally ſignifies *a joining*, or connecting of one thing to another.

Commissure, in *Architecture*, &c. denotes the joint of two ſtones; or the application of the ſurface of the one to that of the other.

COMMISSURÆ *Cerebri*, in *Anatomy*, are parts of the brain, which join together the right and left ſides of this viſcus.

There are three of theſe commiſſures: an anterior one which is directly under the anterior crura of the fornix; a poſterior, which is behind the optic thalami, and in front of the tubercula quadrigemina; and a middle one, which joins together the oppoſed convexities of the thalami nervorum opticorum. For a further deſcription of theſe parts, ſee Brain.

COMMITMENT, in *Law*, the ſending of a perſon to priſon by warrant or order, who hath been guilty of any offence not bailable, or for which bail is refuſed. It may be by the king and privy council, or ſecretary of ſtate, by the judges of the law, juſtices of peace, and other magiſtrates, who have authority by the laws and ſtatutes of the realm to do it, which muſt be exactly purſued.

As to the manner of commitment, it is enacted by 2 & 3 P. & M. c. 10., that juſtices of peace ſhall examine perſons brought before them for felony, &c. or ſuſpicion thereof, before they commit them to priſon, and ſhall bind their accuſers to give evidence againſt them. A juſtice of the peace may detain a priſoner for examination, and it is ſaid that three days are a reaſonable time for this purpoſe. 2 Hawk. P. C. c. 16. § 11, 12. Dalt. c. 125. 2 Inſt. 52, 591.

Every commitment muſt be in writing, under the hand and ſeal, and ſhew the authority, of him that made it, and the time and place, and muſt be directed to the keeper of the priſon. It may be either in the king's name, and only teſted by the juſtice, or in the name of the juſtice. It may command the gaoler to keep the party in ſafe and cloſe cuſtody, which he is bound by law to do. 2 Hawk. P. C. c. 16. § 13, 14, 15. It ought to ſet forth the crime with convenient certainty, whether the commitment be by the privy council, or by any other authority; otherwiſe the officer is not puniſhable by reaſon of ſuch mittimus, for ſuffering the party to eſcape; and the court before which he is removed by Habeas-corpus, ought to diſcharge or bail him; and this holds not only where no cauſe at all is expreſſed in the commitment, but alſo where it is ſo looſely ſet forth, that the court cannot judge whether it were a reaſonable ground for commitment or not. 2 Hawk. P. C. c. 16. § 17. See Arrest and Bail. A commitment for high treaſon or felony in general, without expreſſing the particular ſpecies, has been held good. (2 Hawk. P. C. c. 16. § 16.) But now, ſince the Habeas-corpus act, it ſeems that ſuch general commitment is not good. Moreover, it is ſafe to ſet forth that the party is charged upon oath; but this is not neceſſary, for it hath been reſolved, that a commitment for treaſon, or for ſuſpicion of it, without ſetting forth any particular accuſation or ground of the ſuſpicion, is good. 2 Hawk. P. C. c. 16. § 17. Every ſuch mittimus ought to have a lawful concluſion, *viz.* that the party be kept till he be delivered by law, or by order of law, or by due courſe of law; or that he be kept till further order (which ſhall be intended of the order of law) or to the like effect; and if the party be committed only for want of bail, it ſeems to be a good concluſion of the commitment, that he be kept till he can find bail; but a commitment till the perſon who makes it ſhall take further order, ſeems not to be good: and it ſeems that the party committed by ſuch or any other irregular mittimus, may be bailed. 2 Hawk. P. C. c. 16. § 18.

A commitment grounded on an act of parliament ought to be conformable to the method preſcribed by ſuch ſtatute. Where a man is committed as a criminal, the concluſion muſt be, "until he be delivered by due courſe of law;" if he be committed for contumacy, it ſhould be "until he comply."

All commitments muſt be to ſome priſon within the realm of England; for by the Habeas-corpus act (ſtat. 31 Car. II. cap. 2.) it is enacted "that no ſubject of this realm, being an inhabitant or reſiant of this kingdom of England, dominion of Wales, or town of Berwick-upon-Tweed, ſhall or may be ſent priſoner into Scotland, Ireland, Jerſey, Guernſey, Tangier, or into any ports, garriſons, iſlands or places, beyond the ſeas, which then were, or at any time after ſhould be, within or without the dominions of his majeſty." By ſtat. 14 Ed. III. c. 10, ſheriffs ſhall have the cuſtody of the gaol as before that time they were wont to have, and they ſhall put in ſuch under keepers for whom they will anſwer. This is confirmed by ſtat. 19 Hen. VII. c. 10. It hath alſo been held, that regularly no one can juſtify the delivering of a priſoner in cuſtody out of the common gaol, unleſs there be ſome particular reaſon for ſo doing, as ſickneſs endangering life, or evident danger of a reſcous from rebels, &c.: nevertheleſs conſtant practice ſeems to authorize a commitment to a meſſenger; and it is ſaid, that it ſhall be intended to have been made in order for the carrying of the party to gaol. 2 Hawk. P. C. c. 16. § 8, 9. And it is ſaid, that if a conſtable bring a felon to gaol, and the gaoler refuſe to receive him, the town where he is conſtable ought to keep him till the next gaol delivery. H. P. C. 114. 2 Hawk. P. C. c. 16, § 9. A priſoner in the cuſtody of the king's meſſenger, on a warrant from the ſecretary of ſtate, who is brought into K. B. by Habeas-corpus to be bailed, but has not his bail ready, cannot be committed to the ſame cuſtody, under which he came; but muſt be committed to the cuſtody of the marſhal, which will prevent the neceſſity of ſuing out a new Habeas corpus; as he may be brought up from the priſon of the court, by a rule of court, whenever he ſhall be prepared to give bail. 1 Burr. 460. If a perſon arreſted in one county for a crime done in it, fly into another county, and be retaken there, he may be committed by a juſtice of the firſt county to the gaol of ſuch county. (H. P. C. *93.*) But by the better opinion, if he had, before any arreſt, fled into ſuch county, he muſt be committed to the gaol thereof by a juſtice of ſuch county. 2 Hawk. P. C. c. 16. § 8. Dalt. c. 118. It ſeems alſo to be laid down as a rule by ſome books, that any offender may be committed to the gaol next to the place where he was taken, whether it be in the ſame county or not. 2 Hawk. P. C. c. 16, § 8. By ſtat. 6 Geo. I. c. 19. vagrants and other criminals, and perſons charged with ſmall offences, may, for ſuch offences, or for want of ſureties, be committed either to the common gaol or houſe of correction, as the juſtices ſhall think proper. By ſtat. 24 Geo. II. c. 55. if a perſon is apprehended, upon a warrant indorſed, in another county, for an offence not bailable, or if he ſhall not there find bail, he ſhall be carried back into the firſt county, and be committed, or if bailable, bailed by the juſtices in ſuch firſt county.

With reſpect to the charges of commitment, it is enacted by ſtat. 3 Jac. I. c. 10, that offenders committed are to bear their own charges, and the charges of thoſe who are appointed to guard them; and if they refuſe to pay, the charges may be levied by ſale of their goods. And by ſtat. 27 Geo. II. c. 3. if they have no goods, &c. within the county where they are apprehended, the juſtices are to grant a warrant on the treaſurer of the county for payment of their charges. But in Middleſex the ſame ſhall be paid by the overſeers of the poor of the pariſh where the perſon was apprehended. By ſtat 3 Hen. VII. c. 3. the ſheriff ſhall certify the names of all priſoners in his cuſtody to the juſtices of gaol delivery.

Priſoners, committed at firſt to the proper priſon, ought not to be removed thence, except in ſome ſpecial caſes; and in peculiar circumſtances, ſpecified by 31 Car. II. c. 2. A perſon, legally committed for a crime, which certainly appears to have been done by ſome one or other, cannot be lawfully diſcharged by any other but the king, till he be acquitted on his trial, or have an *ignoramus* found by the grand jury, or none to proſecute him on a proclamation for that purpoſe, by the juſtices of gaol-delivery. But if a perſon be committed on a bare ſuſpicion, without any appeal or indictment, for a ſuppoſed crime, when afterwards it appears there was none; as for the murder of a perſon thought to be dead, but afterwards found to be alive, it hath been held that he may be ſafely diſmiſſed without any farther proceeding. 2 Hawk. P. C. c. 16. § 22. But the ſafeſt way for the gaoler is to have the authority of ſome court, or magiſtrate, for diſcharging the priſoner. If the words of a ſtatute are not purſued in a commitment, the party ſhall be diſcharged by Habeas-corpus. Jacob's Law Dict. by Tomlins. See Arrest, Bail, Imprisonment, Mittimus, &c.

COMMITTEE, in *Law*, one or more perſons, to whom the conſideration of any matter is referred, either by a court, or by conſent of the parties concerned.

Committee *of Parliament*, is a board conſiſting of a certain number of members, appointed by the whole houſe for the examining of a bill, or making report of an inquiry, or proceſs of the houſe, &c.

Sometimes the whole houſe is reſolved into a *committee*; on which occaſion each perſon has a right to ſpeak, and reply as much, and as often as he pleaſes; an expedient they uſually have recourſe to in extraordinary caſes, and where any thing is to be thoroughly canvaſſed. When the houſe is not in a *committee*, each gives his opinion regularly, and is only allowed to ſpeak once, unleſs to explain himſelf.

The ſtanding *committees*, appointed by every new parliament, are thoſe of *privileges* and *elections*, of *religion*, of *grievances*; of *courts of juſtice*, and of *trade*, though only the former act. See Parliament.

Committee *of the king*, is uſed for a widow of one of the king's tenants; thus called, as being by the ancient law of the realm *committed* to the king's care and protection. See Widow.

Committee of a *Lunatic*, *Ideot*, &c. denotes the perſon to whom the care and cuſtody of ſuch lunatic, &c. is committed by the court of chancery. See Lunatic.

Committees of *Corporations*, &c. are ſelect members who perform the general routine of buſineſs. See Corporations.

COMMODATE, Commodatum, in the *Civil Juriſprudence*, the loan or free conceſſion of any thing moveable or immoveable, for a certain time on condition of reſtoring again the ſame individual after a certain term.

The commodate is a kind of loan; there is this difference, however, between a loan and a commodate, that the latter is gratis, and does not transfer the property: the thing muſt be returned in eſſence, and without impairment: ſo that things which conſume by uſe, or time, cannot be objects of a commodate, but of a loan; in regard they may be returned in kind, though not in identity.

COMMODAVIENSIS, an appellation given by ſome authors to a ſpecies of *lapis calaminaris* found in Bohemia. But as it yields no zinc, Mr. Marggraff denies it to be true calamine.

COMMODITIES, *Staple*. See Staple.

COMMODORE, in the *Britiſh Marine*, a general officer inveſted with the command of a detachment of ſhips of war deſtined on any particular enterprize; during which time he bears the rank of a brigadier-general in the army; and his ſhip is diſtinguiſhed by a broad red pendant tapering towards the outer end, and ſometimes forked.

Commodore is alſo a name given to a ſelect ſhip in a fleet of merchantmen, which leads the van in time of war, bearing a light in her top to conduct the reſt.

COMMODUS, Lucius Aurelius Antoninus, in *Biography*, was the only ſon of the emperor Marcus Antoninus and Fauſtina, and born A. D. 161. He was educated with the utmoſt attention, and he enjoyed very ſuperior advantages from the precepts and inſtructions of tutors appointed to preſide over his infantile ſtudies and purſuits; but from the firſt openings of his mind, he diſplayed an untoward diſpoſition, and a ſtrong propenſity for low and unworthy gratifications. He diſcovered an averſion from whatever was rational ar[illegible]ral, and a fond attachment to the ſports of the c[illegible] amphitheatre, the combats of gladiators, and the hunting and deſtroying of wild beaſts. To wean him from theſe purſuits, and with a view of engaging his mind in uſeful and manly occupations, his father made him a partaker of the ſovereign power in his fifteenth year. This inſtance of parental affection did not produce the deſired effect; it only furniſhed him with better opportunities of indulging every ſenſual gratification. Upon the death of Marcus, in the year 180; he ſucceeded to the quiet and undiſputed poſſeſſion of the throne; he ſaw about him neither competitor to remove nor enemies to puniſh, and during the firſt three years of his reign, the influence of his father's virtuous counſellors reſtrained him from any acts of tyranny towards his ſubjects. During this period, however, he indulged in every ſpecies of licentiouſneſs, and revelled in all the licence of ſovereign and unreſtrained power, but his hands were unſtained with blood, and occaſionally he diſplayed a generoſity of ſentiment worthy of a great mind; he had in one inſtance refuſed to ſee the proofs of a conſpiracy formed againſt him, and it was hoped he might have followed the track of his illuſtrious father. A fatal incident decided his fluctuating character. An aſſaſſin was employed to deſtroy him; in making the attempt he exclaimed "the ſenate ſends you this." The deed was prevented, and Commodus from that hour encouraged a deep-rooted hatred for the whole body of ſenators. Spies and informers increaſed his ſuſpicions and excited his jealouſy of power in any other hands than his own. Accuſation was regarded as proof, and the mockery of a pretended trial led only to certain condemnation. The execution of any conſiderable ſenator was ever attended with the death of all thoſe who ſhould attempt to revenge, or publicly dare to lament his fate, and when Commodus had taſted of human blood, he became incapable of pity or remorſe. His miniſters were one after another the victims of his fears or of his cruelty. Perennis was condemned to die for a charge of aſpiring to the empire, and after his death the conduct of Commodus aſſumed the appearance of virtue. He repealed the moſt odious of his miniſter's acts, loaded his memory with public execrations, and aſcribed to his pernicious counſels, all the errors of inexperienced youth. But his ſeeming repentance laſted only a ſhort month, and then every ſentiment of humanity appeared to be obliterated from his breaſt. He abandoned the reins of government to the moſt unworthy, and he valued nothing in ſovereign power, except the unbounded licence of indulging his ſenſual appetites. His hours were ſpent in a ſeraglio of beautiful women and boys, ſelected from all ranks of the people, and from every province of the empire. The intervals of luſt were filled up with the baſeſt amuſements. The ſervile crowd, whoſe fortune depended on their monarch's vices, applauded theſe vile purſuits. Having by long practice attained great ſkill in the uſe of the bow, he exhibited his talents before the people, and animals of the rareſt ſpecies were collected from the remoteſt part of his dominions in order to ſerve as marks for the ſceptered archer. The perfidious voice of flattery reminded him that by exploits of the ſame nature, the Grecian Hercules had acquired a place among the gods, and an immortal memory among men. He accordingly aſſumed the title and inſignia of Hercules; in this character he aſſembled all the helpleſs and diſtreſſed of the city, and cauſing them to be wrapped up in fantaſtical habits, like dragons and monſters, and armed with ſponges inſtead of ſtones, he ruſhed upon them with his club and laid them all dead at his feet. He exhibited himſelf more than 700 times in the character of a gladiator, and in all his combats he was victorious, but his amuſements in this way were frequently fatal to his antagoniſts. It would take more of our work than can be allotted to this article to deſcribe all the cruelties and acts of ſavage barbarity which diſgraced the reign of Commodus. At length his deteſtable career came to its merited end. Oppoſition to his bloody deſigns was given by ſome of his boſom counſellors, among whom was Marcia, his favourite concubine. He reſolved to put them to death, and entered their names in a long liſt deſtined to the ſame fate. Marcia diſcovered his intentions, and apprized her friends of their common danger. They reſolved to anticipate the blow, and Marcia mixing ſome poiſon in wine, preſented it to him as he came from the bath. He ſoon fell aſleep, but the doſe not being ſufficiently ſtrong, he awoke; while, however, he was labouring under the effects of the poiſon, a robuſt youth, by profeſſion a wreſtler, entered his chamber, and ſtrangled him without reſiſtance. The body was ſecretly conveyed out of the palace, before a ſuſpicion was entertained either in the city or the court of the emperor's death. Such was the fate of Commodus, and "ſo eaſy," ſays the hiſtorian, "was it to deſtroy a tyrant, who, by the artificial powers of government, had oppreſſed, during thirteen years, ſo many millions of ſubjects, each of whom was equal to their maſter in perſonal ſtrength and perſonal abilities." Gibbon.

COMMOIGNE, in *Law*, a word ſignifying a fellow-monk, that lives in the ſame convent. 3 Inſt. 15.

COMMON, in *Agriculture*, an open piece of ground, made uſe of equally by different perſons who occupy lands in the pariſh to which it belongs or in which it lies.

It is remarked by Mr. Marſhall in his "Treatiſe on Landed Property," in regard to the origin of commonable lands, "that, a very few centuries ago, nearly the whole of the lands of England lay in an open, and more or leſs in a commonable ſtate. Each pariſh, or townſhip, (at leaſt in the more central and northern diſtricts) compriſed different deſcriptions of lands; having been ſubjected, during ſucceſſive ages, to ſpecified modes of occupancy, under ancient and ſtrict regulations, which time has converted into law. Theſe parochial arrangements, however, varied ſomewhat in different diſtricts; but, in the more central and greater part of the kingdom, not widely. Under this ingenious mode of organization, each *pariſh* or *townſhip* was, he ſays, conſidered as *one common farm*, though the tenantry were numerous. Round the village in which the tenants reſided lay a few ſmall incloſures or *graſs yards* for rearing calves, and as baiting and nurſery grounds for other farm-ſtock. This was the common farmſtead or *homeſtall*, which was generally placed as near the centre of the more culturable lands of the pariſh or townſhip as water and ſhelter would permit." And that "round the homeſtall lay a ſuit of *arable fields*, including the deepeſt and ſoundeſt of the lower grounds, ſituated out of waters' way, for raiſing corn and pulſe: as well as to produce fodder and litter for cattle and horſes in the winter ſeaſon." While in the loweſt ſituation, as in the water-formed baſe of a rivered valley, or in ſwampy dips, ſhooting up among the arable lands, lay an extent of *meadow grounds* or *ings*, to afford a ſupply of hay for cows and working ſtock, in the winter and ſpring months.

That on the out-ſkirts of the arable lands, where the ſoil is adapted to the paſturage of cattle, or on the ſpringy ſlope of hills, leſs adapted to cultivation, or in the fenny leaſes of vallies, which were tunnel or gravelly water-formed lands, which were too dry to produce an annual ſupply of hay with ſufficient certainty, one or more *ſtinted paſtures*, or hams, were laid out, for milking cows, working cattle, or other ſtock which requires ſuperior paſturage, in ſummer.

While the bleakeſt, worſt-ſoiled, and moſt diſtant lands of the townſhip were left in their native wild ſtate, for *timber* and *fuel*, and for a *common paſture*, or ſuit of paſtures, for the more ordinary ſtock of the townſhip, whether horſes, rearing cattle, ſheep or ſwine, without any other ſtint, or reſtriction, than what the arable and meadow lands indirectly gave; every joint tenant, or occupier of the townſhip, having the nominal privilege of keeping as much live ſtock on theſe commons, in ſummer, as the appropriated lands he occupied would maintain, in winter.

Further, that the appropriated lands of each townſhip were laid out with equal good ſenſe and propriety. That each occupier might have his proportionate ſhare of lands of different qualities, and lying in different ſituations, the arable lands more particularly were divided into numerous parcels, of ſizes, doubtleſs, according to the ſize of the given townſhip, and the number and rank of the occupiers.

And that the whole might be ſubjected to the ſame plan of management, and be conducted as one common farm, the arable lands were moreover divided into compartments, or "fields," of nearly equal ſize, and generally three in number, to receive, in conſtant rotation, the triennial ſucceſſion of fallow, wheat (or rye), and ſpring crops, (as barley, oats, beans, and peas), thus adopting and promoting a ſyſtem of huſbandry, which, howſoever improper it is become in theſe more enlightened days, was well adapted to the ſtate of ignorance and vaſſalage of feudal times, when each pariſh or townſhip had its ſole proprietor; the occupiers being at once his tenants and his ſoldiers, or meaner vaſſals. The lands were in courſe liable to be more or leſs deſerted by their occupiers, and left to the feebleneſs of the young, the aged, and the weaker ſex. But the whole townſhip being, in this manner, thrown into one ſyſtem, the care and management of the live ſtock at leaſt would be eaſier and better than they would have been under any other arrangement. And at all times, the manager of the eſtate was better enabled to detect bad huſbandry, and enforce that which was profitable to the tenants and the eſtate, by having the whole ſpread under the eye at once, than he would have been had the lands been diſtributed in detached incloſed farmlets, beſides avoiding the expence of incloſure. And another advantage, he thinks, aroſe from this more ſocial arrangement: in barbarous times the tenants, by being concentrated in villages, were not only beſt ſituated to defend each other from predatory attacks,

tacks, but were called out by their lord with greater readineſs in caſes of emergency.

But it is remarked, that beſide the organized townſhips which were inhabited and cultivated in the manner deſcribed, there were, and are to the preſent day, in different parts of England, extenſive tracts of lands, ſome of them of a valuable quality, which lie nearly in a ſtate of wild nature!—Theſe uninhabited tracts are ſtyled *foreſts*, and heretofore many or moſt of them have been attached to the crown; and ſome of them are ſtill under royal patronage. Whether they were originally ſet out for amuſement merely, or whether the timber which ſtood on them was of peculiar value, or whether, at the time of laying out townſhips, thoſe tracts were impenetrable woods. inhabited by wild beaſts, and when theſe were deſtroyed, or ſufficiently overcome to render them objects of diverſion, wete taken under the protection of the crown, is not perhaps well aſcertained. But let the original intention have been either of theſe, it no longer exiſts. The timber in moſt caſes has fallen a ſacrifice to age and neglect, and the *game* is no longer an object of regal paſtime. But whether or not the foreſts (now ſo called) originated in wild woodlands, occupied by ferocious animals at the time of laying out townſhips, there were doubtleſs tracks of that deſcription in different parts of the kingdom, and which now bear no marks of the common field ſyſtem; but which appear evidently to have been incloſed from a ſtate of woodland or common paſture; though it is poſſible they may have been nominally attached to neighbouring pariſhes. Of this deſcription principally are the wealds of Kent and Suſſex, and many other old incloſed lands in different parts of the kingdom, whoſe fields or incloſures are of irregular ſhapes, and their fences crooked. And it is obſervable, that theſe woodland diſtricts, as the foreſt lands, are divided into manors, which have not an intimate connection, or correſpondence with pariſhes or townſhips; a further evidence that they were in a wild ſtate, when the feudal organization took place.

It is ſtated by the author of "Modern Agriculture," that "on all the open field pariſhes, where the ſame arrangement continues as was at firſt eſtabliſhed, there is a conſiderable extent of common field allotted for the paſturage of the live ſtock belonging to the inhabitants. Theſe generally conſiſt of ſuch lands as are leſs fit for the plough, or more diſtant from the town or village. The pariſh commons are for the moſt part divided into three fields; one for the paſturage of the horſes, another for the neat cattle, and the third for the ſheep. Theſe horſes are generally tended by one of the farmer's ſervants. The whole of the ſheep belonging to the pariſh are put under the charge of a common ſhepherd, who is hired at the general expence; and the cows and young cattle are taken care of nearly in a ſimilar manner. Where the inhabitants of ſeveral adjoining pariſhes poſſeſs rights of common paſturage on an extenſive common, as is frequently the caſe, particularly in the counties of Middleſex, Surry, Northampton, and other diſtricts in the middle and ſouthern parts of the kingdom, all the horſes, cattle, ſheep, hogs, &c. which are ſent to the commons, are committed to the care of one or more perſons appointed for the purpoſe. In ſome caſes the right is limited; or, as it is called, *ſtinted*. When that is the caſe, ſuch a number of cattle only, as the ſtraw and hay growing on the farms will maintain in winter, is permitted to paſture theſe commons in ſummer. And therefore each farmer is, by particular laws, prevented from ſending above a certain number, which is regulated, partly by the extent of his farm, and in ſome caſes by the title on which he claims a right of commonage in the particular inſtance.

But where the common is unſtinted; or in other words, where the farmers poſſeſs right of paſturing any number and ſpecies of live ſtock which they chooſe to ſend, and without reſtraint of any kind, the value of ſuch right is conſidered by many farmers ſo inconſiderable as not to be worthy of their attention. Such farmers as poſſeſs improved breeds of horſes, cattle, and ſheep, ſeldom, indeed, if ever, ſend any of them to be paſtured on the commons, whether ſtinted or unſtinted. They generally diſpoſe of their right, for a trifle, to ſome neighbouring farmers or dealers, who have no objection, in the view of profit, of running the riſk of their cattle meeting with accidents, or being infected with diſeaſe, as muſt naturally be expected to happen on theſe extenſive commons, where ſo many cattle are promiſcuouſly collected together.

It has been remarked by a late able writer, that "the commons in Middleſex, as in moſt other places, are three fourths of them covered with heath and furze, from which a little of the worſt ſort of firing is obtained by the poor. The trifling quantity of food which cattle conſume from theſe ſhrubs, does not, and indeed cannot, improve them, as it is barely ſufficient to keep them from ſtarving. Much of the remainder is occupied by roads, gravel pits, and ponds, yielding nothing. After the moſt mature conſideration, he is inclined to think, that about 5,500 acres of the commons in the above county are employed in the production of graſs for the feeding of cattle, affording indeed but a miſerable paſture, as the greater part is under water during winter; and, from being poached and trodden down by cattle while wet, is rendered hard, lumpy, full of holes, and partakes of the ſterility of mortar during ſummer. The graſſes are moſtly of the dwarf kind, and of ſcanty produce, with a large proportion of the carnation and other graſſes which are known to be rather more dangerous than nouriſhing; ſo much ſo, as to induce ſome of the moſt obſerving farmers in various parts of the kingdom, poſſeſſing extenſive common rights, after a fair trial to refrain altogether from turning their cattle on ſuch commons.

On ſuch authority it may well, he ſays, be queſtioned, whether commons are of any more uſe to the community than they would be were they conſigned to the bottom of the deep. But without attempting the ſolution of ſuch a queſtion at preſent, he may be allowed to obſerve, that the value of commons, conſidered ſolely as to their power of increaſing animal food, and as totally unconnected with the adjoining incloſures, is extremely ſmall indeed. But when conſidered as affording an opportunity to the neighbouring farmer to turn his ſtock out, at certain ſeaſons of the year, they become an object of ſome importance. For in the ſpring quarter of the year, by receiving the ſtock during theſe months, the growth of hay is encouraged, they anſwer the purpoſe of paſture, and the farmer is thereby enabled to mow all his graſs land: which muſt ſenſibly increaſe the quantity of hay to be ſent to market; as at Finchley and Harrowweald in this county; or being applied during the winter months to the ſupport of a greater quantity of live-ſtock in places more diſtant from a good hay-market; and in others, for the purpoſe of folding on the arable land."

It is further ſtated, that "on eſtimating the value of the commons in the ſame county, including every advantage that can be derived from them in paſturage, locality of ſituation, and the barbarous cuſtom of turbary, it appears, he ſays, that they do not produce to the community, in their preſent ſtate, more than four ſhillings per acre! On the other hand, they are, in many inſtances, of real injury to the public, by holding out a lure to the poor man for procuring the means of materials wherewith to build his cottage, and ground to erect it upon; together with firing, and the run of his poultry and pigs for nothing. This is of courſe temptation ſufficient to induce a great number of poor perſons to ſettle upon the borders of ſuch commons, But the miſchief does not, he ſays, end here: for having gained theſe trifling advantages, through the neglect or connivance of the lord of the manor, it unfortunately gives their minds an improper bias, and inculcates a deſire to live from that time forward without labour, or at leaſt with as little as poſſible. The animals kept by this deſcription of perſons, it is ſoon diſcovered by their owners, are not likely to afford them much revenue, without better feed than the ſcanty herbage of a common. Hence they are tempted to pilfer corn, &c. towards their ſupport: and, as they are ſtill dependent on ſuch a deceptious ſupply, to anſwer the demands of their conſumption, they are in ſome meaſure conſtrained to reſort to various diſhoneſt means, ſo as to make up the deficiency.

And there is another very ſerious evil which the public ſuffers from theſe commons, the ſame writer obſerves, which is, "that they are the conſtant rendezvous of gipſies, ſtrollers, and other looſe perſons, living under tents, which they carry with them from place to place according to their conveniency. Moſt of theſe perſons have aſſes, many of them horſes, nay, ſome of them have even covered carts, which anſwer the double purpoſe of a caravan for concealing and carrying off the property they have ſtolen, and alſo of a houſe for ſleeping in at night. They uſually ſtay a week or two at a place; and the cattle which they keep ſerve to tranſport their few articles of furniture from one common to another. Theſe, during the ſtay of their owners, are turned adrift to procure what food they can find in the neighbourhood of their tents, and the deficiency is made up from the adjacent hay-ſtacks, barns, and granaries. They are known, he ſays, never to buy any hay or corn, and yet their cattle are ſupplied with theſe articles of good quality. The women and children beg and pilfer, and the men commit greater acts of diſhoneſty. In ſhort, ſays he, the commons of this county are well known to be the conſtant reſort of footpads and highwaymen, and are literally and proverbially a public nuiſance. And that they are ſo in the more diſtant counties is evident, from the Glouceſter and Hereford reports of the ſtate of agriculture. There are alſo many additional injuries which commons render to ſociety, of other kinds to thoſe which have been noticed above. But that the commons of Middleſex, ſays he, are capable of being improved, ſo as to produce large crops of all the vegetables uſually cultivated, and to rear and ſupport a very highly improved breed of cattle, there can be no ſort of doubt. Indeed it is truly lamentable to ſee, in every part of theſe kingdoms, ſuch extenſive tracts of land lying waſte or uncultivated; producing no revenue to the owners of ſuch property, and extremely doubtful if of any, the ſmalleſt benefit to the community. But it is particularly diſgraceful to this, the firſt and principal county, which, ſo far from raiſing a ſufficient ſupply of bread for its inhabitants, is under the neceſſity of importing corn from every quarter of the world (Europe, Aſia, Africa, and America,) while, at the ſame time, it has ſo many acres of good land lying waſte, and locked up from the operation of the plough. By the ſingle means of incloſure an abundant quantity of corn might be produced, and 150,000 *l.* a year added to the wealth of the county, which is now abſolutely loſt to ſociety, with as careleſs an indifference as if the proprietors of the ſoil were afraid of becoming too rich; or, as if like the dog in the manger they would not permit the community to ſhare in a bleſſing of which they themſelves are not inclined to partake.

The benefits and advantages that would be derived from a general incloſure of commons, are, he thinks, ſo numerous, as far to exceed his powers of deſcription or computation. The opportunity it would afford of ſeparating dry ground from wet, of well draining the latter, and liming the rotten parts, is of infinite conſequence: as ſuch an arrangement would, with the aid of intelligent breeders, be the means of raiſing a breed of ſheep and neat cattle far ſuperior to the preſent race of wretched half-ſtarved animals now ſeen in ſuch ſituations. It would have the effect of ſupporting a more numerous ſtock upon the ſame quantity of food by reſtraining the cattle and ſheep within due bounds. Their reſtleſs and rambling diſpoſition not only treads the graſs off the ground, but alſo takes the fleſh off their bones. This renders the attendance of a ſhepherd neceſſary, and requires likewiſe that they may be driven to and from the fold. Further, the live-ſtock would by this means be rendered many hundreds per cent. more valuable to individuals and the community than it has hitherto been, or can poſſibly be, without incloſure; and, what is of the laſt, the greateſt importance, it would tend to preſerve ſuch improved breeds from that deſtructive malady, (the rot) which makes ſuch terrible havoc among our flocks. Add to this, that the markets would be more plentifully ſupplied with beef and mutton, and the price of theſe articles conſiderably reduced.

It does not, he ſays, appear neceſſary to ſtate with preciſion (nor indeed is it capable of being ſo ſtated) what would be the encreaſe or value of the commons of this country on their being incloſed and well and properly cultivated. It may, however, with ſafety be ſtated at upwards of 15 times their preſent value to the proprietors, and 40 times their preſent value to the public. But increaſing the rental of ſuch land to 15, or perhaps 20 times, its preſent amount, is by no means the greateſt advantage that may be expected to reſult from an incloſure of commons. The general ſalubrity and healthineſs of the country would neceſſarily be improved, while induſtry would be largely encreaſed among the moſt uſeful claſſes of ſociety, beggary and robbery much leſſened, and the general ſtock of corn and cattle almoſt inconceivably augmented. And whereever incloſures are made with due attention to the intereſt of the poor (as they ought always to be), they will be found to ameliorate their condition, as much as they increaſe the property and the comforts of the rich."

It is further obſerved, that "the commons of this kingdom being, with very few exceptions, without ridges, furrows, or drains, have not the means of diſcharging that ſuperfluous water from the ſurface of them, which is well known to be of great detriment to vegetation in general.

Many commons in low ſituations, and where the ſoil happens to be of a retentive quality, hold water like a ſponge, which being always ſtagnant, as well as exceſſive in quality, renders the ſoil of ſuch commons much too wet for the paſturage of ſheep, and is, no doubt, the cauſe of many of the diſorders which that animal is ſubject to, particularly that fatal malady, the rot. From the ſame cauſes, alſo, the neighbourhood of moſt commons muſt be particularly unfriendly to the health and longevity of man. Only let us, ſays he, reverſe the ſcene, and for a moment ſuppoſe theſe commons to be incloſed, the neceſſary ditches and drains ſunk, and the land brought into tillage, and we ſhall ſee all the ſuperabundant moiſture got rid of; and the water, being kept in conſtant motion, by trickling down the ſides of the ridges into the furrows, and from thence into the ditches and rivulets, will be found to fertilize the very ſoil which in its preſent ſtagnant ſtate it ſerves to injure; while, by leaving the land dry, it will be rendered more healthy both for men and cattle. The effects of ſuch a meaſure would ſoon ſhew themſelves in many diſtricts of this iſland, which, at preſent, are very unpropitious to the health of man, in the much greater longevity of the inhabitants. It may alſo be further noticed, he ſays, that commons are entirely defective in the great article of labour; but no ſooner does an incloſure take place, than the ſcene is agreeably changed from a dreary waſte, to the more pleaſing one of the ſame ſpot, appearing all animation, activity, and buſtle. Every man, capable of performing ſuch operations, is furniſhed with plenty of employment, in ſinking ditches and drains, in making banks and hedges, and in planting quicks and trees. Nor are the wheelwright, carpenter, ſmith, and other rural artificers, under the neceſſity of being idle ſpectators of the ſcene, ſince abundance of work will be found for them, in the creation of farm houſes, and the neceſſary appendages thereto; and in the forming and making of roads, bridges, gates, ſtiles, implements of huſbandry, &c. Even after a few years, when this kind of temporary exertion is over, by the whole being brought into a regular ſyſtem of huſbandry, it will ſtill continue to provide both food and employment for a very increaſed population.

“ It is highly probable, he thinks, that if the legiſlature ſhould paſs an act for the general incloſure of waſte land, it would increaſe the quantity of rural labour ſo much as to advance its price conſiderably, and thereby have the good effect of drawing a vaſt number of hands out of the unwholeſome confinement of manufactories; where, in addition to the life-ſhortening effects of ſuch confinement, the morals of the people are expoſed to certain contamination.”

With reſpect to the effect produced by incloſures on the population of the country, it may be obſerved, that the incloſing of 1000 acres in any one pariſh would probably require 100 different labourers, many of whom would undoubtedly be drawn from ſuch of the adjoining pariſhes as had leſs work than workmen. Thus it muſt follow, that the neighbouring towns and villages would diminiſh, juſt as much as the pariſh in which the incloſure is going forward, would increaſe its numbers; yet the amount of the community will evidently be the ſame. But although the incloſing of waſte land certainly does not immediately either increaſe or leſſen population, as ſome writers ſeem to have ſuppoſed, yet, that incloſures ultimately affect population, (and that as to its increaſe,) inſomuch as the diſtrict is thereby made more conducive to health, is, he ſays, ſufficiently evident. Every thing that has a tendency to make a nation more healthy and productive, muſt, of neceſſity, operate as a ſtimulus to population. The certainty of a man's being able, with eaſe and comfort, to provide for himſelf and family, by the increaſe of rural labour, is at once an inducement to marriage, and a conſequent increaſe of population.

The inhabitants wholly ſupported by agriculture in England and Wales, appear, the ſame writer ſays, to be nearly, or perhaps quite, ſix millions, (while it ſupplies proviſions for near two millions more,) or one to every ſix acres and a half of cultivated ſoil. The eſtimation is made in this manner.

Estimate.

Cultivators of farms, ſix perſons to every 100 acres, is - - - - - - -	2,340,000
Ditto of gardens, hop-grounds, nurſeries, &c.	300,000
	Brought over 2,640,000
Smiths, wheel-wrights, bricklayers, maſons, carpenters, painters, plumbers, glaziers, various manufacturers of furniture, woollen cloth, and making it up, linen, and making it up, leather, and making it into ſhoes, boots, &c. horſe, harneſs, and ſaddlery; as many of each of this deſcription of perſons, as are wholly employed by the cultivators of the ſoil; men, women, and children, about ſeven perſons to each farm, of 100 acres, is - - - - - - -	2,800,000
The like of millers, bakers, malſters, brewers, diſtillers, ſtarch-makers, dealers in corn, and perſons employed in the commerce of corn -	500,000
The landlords of farms - - - - -	40,000
Perſons ſupported by taxes on the produce of land - - - - - - - - -	120,000
	6,100,000

Not but that the extremes vary much, as there are ſome few grazing farms, with only one ſoul to fifty, and arable farms that are peopled in the proportion of one perſon to three acres of land. In point of produce, the commons, in their preſent ſtate, apparently, though, he thinks, not really afford entire ſupport to human beings, in the proportion of one to an hundred acres. But by being incloſed, and brought into the preſent ordinary cultivation of the country, every ſix acres and a half might do the ſame.

Should agriculture experience a rapid advance towards perfection, as there is reaſon to imagine it will, both from the exertions of the board, and of intelligent individuals, every three or four acres, would, in a few years, be capable of ſupporting its inhabitant; and, as from its nature, it might certainly be carried on from one degree of perfection to another; it may even arrive at ſuch a pitch of excellence, as that every acre of land ſhall ſupport its man.”

It has long ſince been well obſerved by Dr. Anderſon, that while land is in the condition of common, man is debarred from ever being able to ameliorate the ſoil, and thus to augment its product to the ſtate; but that he is not prevented ſo effectually from deteriorating it. While, in the ſtate of a common, the ſurface of the ground may be broken by him in ſuch a way, as not to recover for ages a ſward equal to that which was originally upon it. It may be caſt up and ſunk into pits; it may be converted into wet and rotten marſhes, by caſual obſtructions being thrown in the way of the water, which no one finds it his intereſt to remove; it may, in ſhort, while a common, be abuſed in a thouſand ways, by reaſon of the obſtinacy, indolence, or caprice of individuals, but it never can be benefited by the induſtry of man; and not only may this be done, but theſe things actually are done, in innumerable inſtances; ſo that to a perſon who contemplates the loſs that the nation muſt ſuſtain by theſe deplorable abuſes, nothing can afford a more melancholy train of reflections, than that which the frequent recurrence of thoſe diſguſting commons ſuggeſts to his mind, as he travels over the otherwiſe delightful country of England. When he ſtops to inquire more minutely into the effects of this kind of property upon the morals and domeſtic economy of the individuals who claim a right to theſe commons, he only finds additional cauſes, he ſays, of regret. He frequently diſcovers that the quiet and induſtrious cultivator, having a right upon a common, is obliged to abandon

don that right, becauſe of the harraſſments to which he is ſubjected from turbulent and aſſuming neighbours, who have obtained a ſmall footing there, with a predetermined reſolution, perhaps, to encroach much farther than their rights would authoriſe; becauſe they know that towards the reſtraining of theſe exceſſes, no obvious and eaſy means occur. Thus does the peaceable man often find it better to relinquiſh his right almoſt entirely, than be ſubjected to the perpetual contention that would occur in defending it. Such an inquirer frequently finds, that in conſequence of this, the ſmall flocks of the poor cottager, who cannot afford to look after them continually himſelf, are ſo tormented by being chaſed from place to place by theſe marauders, that inſtead of a relief to the poor cottager, theſe flocks prove only a torment to him; his family becomes, in conſequence of this, a burthen on the pariſh, which is obliged to ſupport them; he finds, that among thoſe who are bred up in theſe ſituations, there are many young men who delight more in active plunder, than in ſober induſtry; and who, tempted by the high prices that luxurious inhabitants of towns offer for game, become poachers, and from ſuch powerful confederations of determined profligates for their mutual protection, that no one, leſs determined than themſelves, will dare to interfere with them; which enables them to carry on their depredations with impunity. He further obſerves, that the money theſe young men thus acquire, is uſually ſquandered in drinking and riotous exceſſes; the young women are contaminated by their converſation, corrupted by their exceſſes, and debauched; the laſt evil attending which courſes, is a great number of illegitimate children, and an extravagant poor rate. But who, ſays he, can eſtimate the detriment that a nation ſuſtains, when the morals of the country inhabitants of it become corrupted? It is like, ſays he, tainting the ſprings of water with poiſon, which, inſtead of promoting health and vigour, as they naturally ought to have done, produce one univerſal maſs of infectious diſeaſe. It is common, he adds, to read in the Hiſtory of Britain, that the rot became at times ſo prevalent in England, as to carry off many millions of ſheep at once; and theſe diſeaſes were regarded, like the peſtilence among the human ſpecies, as a terrible viſitation of heaven for the ſins of a guilty land. There is great reaſon to believe that theſe frequent mortalities among the flocks were entirely occaſioned by the numerous commons, which were in thoſe times much more extenſive than at preſent; for it is ſtill known, that in neglected ſpots, where water is allowed to ſtagnate and generate marſhes, as is often the caſe with commons when the ſeaſon proves wet, the ſheep paſtured upon them are, to this day, ſo much ſubjected to the rot, as to induce many perſons, as has been obſerved, rather to give up their right, than to allow their flocks to enter upon theſe unhealthy paſtures. Conſidered under every poſſible point of view, then, ſays he, it appears to be undeniable, that the prevalence of commons is a great national grievance, which ought, if poſſible, to be removed; and that the Board of Agriculture cannot be more beneficially employed, than by granting all the aid that their wiſdom can deviſe, for removing theſe bars that at preſent tend to prevent the equitable diviſion of this kind of property.

It is evident from every one of the agricultural ſurveys which have been yet made, he ſays, that in every county in England and Wales, there are extenſive tracts of land of this deſcription (for commons and waſtes may be conſidered as nearly ſynonymous terms, although it be a truth that many of theſe commons conſiſt of land naturally as good as any in the kingdom). Of the extent of theſe lands, were it neceſſary, a tolerably accurate knowledge, he thinks, might be obtained; but as to the amount of improvement, it is impoſſible for any perſon to form at preſent an idea of it, ſhould the proſperity of this country be permitted to go forward for a conſiderable length of time in that accelerating ratio into which it would naturally fall, if the general tranquillity of the nation were preſerved, and the obſtructions which have hitherto repreſſed exertions in agriculture removed. It is enough here to ſay, he thinks, that it would be an object of immenſe magnitude. He has had occaſion to obſerve, that in ſome favourable ſituations, it is well known that land, in the courſe of a very few years, has been made a thouſand times at leaſt more productive than in its original ſtate. Many commons are at preſent lying waſte in ſituations equally favourable as theſe; and many other ſituations may become equally favourable by an extenſion of thoſe modes of facilitating intercourſe, which are now in contemplation, and are only prevented from being carried into effect by barriers that judicious laws may eaſily remove. See Waste Land.

In regard to the appropriation of commonable lands, it has been obſerved by Mr. Marſhall, that the ſpecies of unappropriated lands in this country are, at preſent,

1ſt. "Foreſt lands, and other extenſive waſtes, on which ſeveral manors, or adjacent townſhips, have a right of common paſturage.

2d. "Commonable lands of diſtinct townſhips, or manors, whoſe appropriated lands are wholly incloſed, and in a ſtate of mixed cultivation.

3d. "Commonable lands of townſhips, whoſe arable fields, &c. are partially incloſed;" and

4th. "Commonable lands of townſhips, whoſe arable fields remain wholly open."

And in reſpect to the principles on which the appropriation of ſuch lands requires to be conducted, it may be obſerved, that as, by an eſtabliſhed principle of the general law or conſtitution of the country, immemorial cuſtom eſtabliſhes right, neither the original rights and regulations, reſpecting ſuch lands, nor the changes which may have taken place during a ſucceſſion of centuries, from the origin of foreſts and townſhips, to the lateſt periods of time, are objects of inveſtigation or inquiry; but many acquired rights which exiſt in any certain caſe at the time of appropriation, and which would continue to exiſt were it not to take place. "The poſſeſſor of a cottage," ſays the ſame writer, "which has enjoyed, time immemorial and without interruption, the liberty of paſturage, though ſuch cottage were originally an encroachment of a *freebooter* or an *outlaw*, has indiſputably as legal a claim to a proportionate ſhare of the commonable lands, as the poſſeſſor of the demeſne lands of the manor has (merely as ſuch), although they may have deſcended from father to ſon from the time of their ſeverality. For it is evidently on the eſtimated values of the reſpective *rights which exiſt*, and which can be rightfully exerciſed in *time to come*, and on theſe alone, that a juſt and equitable diſtribution can be effected."

It is, however, ſtated, that before the diſtribution of commonable lands among the owners of common paſturage can take place, the more *abſtract rights* which belong to commons require to be eſtimated, and the juſt claims of their poſſeſſors to be ſatisfied. Theſe are, he ſays, principally manorial rights, and the rights of tithes.

The manorial claims are to be regulated by the particular advantages which the lord of a given manor enjoys, and which he will continue to enjoy, while the commons remain open and unappropriated; whether they ariſe from mines, quarries, water, timber, alien tenants, fuel, eſtover, pannage, or game? And that "his claim, as guardian of the ſoil, as productive of *paſturage only*, is in moſt caſes only honorary; he cannot as ſuch (unleſs through ancient cuſtom) profit by the *herbage* or the *browſe* that the ſoil produces." But that " the claim of the lord of the manor, in right of the ſoil on which *thriving timber* is ſtanding, is ſubſtantial. For out of this, he has, in effect, a real yearly income, equal to the annually increaſing value of the timber: a ſpecies of advantage which, if the commons remain open and unappropriated, he will in courſe continue to enjoy, ſo long as the timber continues to increaſe in its value. His claim, therefore, in this reſpect, depends on the quantity of timber, and its ſtate of growth taken jointly. Young thriving timber not only affords an annual increaſe of value at preſent, but will continue its benefits for many years to come, if it be ſuffered to remain undiſturbed on the ſoil which ſupports it, during the eſtimated period of its future increaſe; whereas, dotards, and ſtinted trees which afford no increaſe of value, do not entitle their owner to any ſhare of the ſoil they ſtand upon. The trees themſelves, or their intrinſic value, are all the lord of the manor can have a right to claim."

And further, in like manner, the claims of the crown, or of hereditary rangers (if any), on the foreſt lands, ought, he conceives, to be ſatisfied.

But the claims of *tithe owners*, aggregately conſidered, are more complex and obſcure. In a caſe where the great and ſmall tithes are united, where the tithe of wool and lamb, and that of grain, roots, and herbage, belong to the ſame owner, and where no modus exiſts, it may ſeem to be reaſonable that he ſhould have the option of receiving land of equal value to the exiſting value of the whole of the tithes, or of taking the chance of their value, in the ſtate of cultivation. But ſeeing the evil tendency of corn tithes, and the impropriety of laying on ſo harmful a burthen, as they are now become, upon lands that have never borne it, there can be little riſk in ſaying that it would be at leaſt politic in parliament to prevent it. Beſide, it ſtands part of the ſtatute law, he believes, that the lands which have never been under tillage, ſhall not pay tithes during the firſt ſeven years of their cultivation; during which time, the incumbent's income might, by leaving the tithe to take its courſe, be materially abridged, and his circumſtances thereby be rendered diſtreſſing.

It is therefore concluded, that, on the whole, it appears to be proper in this caſe, that the law ſhould inſtruct commiſſioners to ſet out lands equal to the exiſting value of the tithes at the time of appropriation; and, where much corn land (land fit for corn) ſhall be appropriated, to ſet out a farther quantity, equal to the reverſion of the extra value of the tithes to ariſe from ſuch corn lands, ſeven years after the appropriation ſhall have taken place, above the value of the tithes that exiſt, provided any ſuch extra value ſhall appear by the eſtimates.

And further " in caſes in which the tithe of lamb and wool, and the tithe of corn, &c. belong to ſeparate owners, the line of rectitude and ſtrict juſtice to all parties, appears, he ſays, to be ſtill more difficult to draw. The former is clearly entitled to land, or a money payment equal to his loſs of tithe; but the right of the other is leſs obvious. To cut him off entirely from any ſhare of the lands, and likewiſe from any ſhare of tithes to ariſe from them after they ſhall be appropriated, may ſeem unjuſt; he may be a lay rector, and may have lately purchaſed the tithes, or a clerical rector who has recently bought the advowſon under the expectation of an *incloſure*. On the other hand, it appears to be hard that the proprietors of the pariſh ſhould firſt give up land for the tithe of wool and lamb which will no longer exiſt, and then be liable to a corn tithe on the ſame lands, after they ſhall have beſtowed on them great expence in clearing and cultivation. Indeed the injuſtice of ſuch a meaſure is evident. A middle way, therefore, he thinks, requires to be ſought; and it will be difficult, perhaps, to find one which has more juſtice in it than that which is propoſed for the firſt caſe."

It may, however, ſays he, be urged that, admitting the foregoing regulation to be the true ground on which a remuneration in lieu of tithes of commonable lands ought to be eſtimated, the difficulties of cultivation would in ſome caſes be great, and might be the cauſe of diſpute and delay in the general work of appropriation; and a more practical method, though leſs reconcileable to theory, preſents itſelf. Thus, let a certain proportion in value, of the lands to be appropriated as one, be aſſigned in lieu of the whole of the tithes of the townſhip or manor, ſuppoſing the whole be payable in kind; and if there are more than one tithe owner in the manor or townſhip, let the commiſſioners divide ſuch aggregate allotment among the ſeveral owners and claimants, as the rector, the vicar, &c.; and the owners of land, &c. who pay tithe by ancient modus not in kind: ſuch owners being entitled to a ſhare of the ſame as the tithe owners, in proportion to the advantage they receive, by ſuch ancient privilege.

And if any other abſtract claim on the lands to be appropriated be fairly made out, or any alien right, as that of a non-pariſhioner, or extra manorial occupier who has acquired by ancient grant, or by preſcription, the privilege of depaſturing them, be fully proved, its value requires to be accurately eſtimated, and land to be aſſigned in lieu of it."

When this has been done, the remainder of the *unſtinted commons* of a given townſhip or manor belongs to the owners of its common right lands and houſes; but in what proportion may be difficult to determine with mathematical preciſion. Nevertheleſs, by adhering ſtrictly to the general principle, on which alone he conceives an equitable appropriation can be conducted, *viz.* that of determining each man's ſhare by the benefit which he has a right to receive at the time of appropriation, and which he might continue to receive, were it not to take place, truth and juſtice may be ſufficiently near approached.

He conſiders that one of the firſt ſteps towards an equitable diſtribution of unſtinted commons, is to aſcertain the common right houſes, and to diſtinguiſh them from thoſe which have no right of commonage, and which therefore can have no claim to any ſhare of the lands of the unſtinted commons, further than the right of the lands they ſtand upon.

By ancient, and, he believes, pretty generally received, though ſomewhat vague idea, reſpecting the rights of commonage, the occupier of every common right houſe has the privilege of depaſturing as many cattle, ſheep, or other live ſtock, on the common in ſummer (provided, it muſt be underſtood, that it is large enough to permit every occupier to exerciſe this right), as the grounds he occupies within the townſhip or manor can properly maintain in winter; and no one can exceed that proportion, for the ſurplus of the paſturage (if any) belongs to the lord of the ſoil, according to Fitzherbert and Blackſtone.

Under this regulation, the appropriated lands of a common field townſhip, which are not occupied jointly with a common right houſe, may be ſaid to be deprived, during the time they are ſo occupied, of their right of commonage. And in ſome of the private bills of incloſure, which have been ſuffered to paſs through parliament, the lands which happened to be in this ſtate of occupancy at the time of paſſing the bills, were deprived of their intereſt in the common lands, for ever: Notwithſtanding, perhaps, they had a few years preceding this accidental circumſtance, an undoubted right to their portion of them; a right which, a few weeks or a few days afterward, might have reverted to them, without the ſmalleſt ſtint, by the temporary alienation. If any of the appropriated lands of a townſhip or manor have been eſtranged from its commons, during time immemorial, have never been occupied jointly with a common right houſe, or in any way enjoyed of right the common paſturage, within memory, they may, with ſome reaſon, be ſaid to have loſt their right, and be excluded from a participation.

It is ſtated, that by this ancient, and in a degree eſſential, uſage, common right houſes have a clear right to the land of the commons, ſuperior to the ground they ſtand upon; eſpecially if they rightfully enjoy a privilege of partaking of the fuel and pannage they afford; for theſe properly belong to the houſes, not to the lands; and ſtill eſpecially if they are not conveniently ſituated for enjoying the ſeveral benefits which the commons afford in their wild ſtate. And whatever a common right houſe is worth, merely as ſuch, that is to ſay, whatever it will let or ſell for, over and above a non-common right houſe of the ſame intrinſic value, it certainly ought to participate, in the diſtribution, according to ſuch extra value.

"The true proportionate ſhares of the common right lands are to be aſcertained on the ſame principle. For although the ancient regulation reſpecting common right may continue in force while the commons remain open and unappropriated, it would be found troubleſome, or unmanageable, as a rule to their juſt appropriation. There are few, if any, commons (of common-field townſhips at leaſt) that now afford paſturage in ſummer for all the ſtock which the appropriated lands are capable of maintaining in winter; ſo that their ſeveral proportions only could be uſed: and theſe proportions may be calculated with much greater certainty and diſpatch, on the reſpective rental values of the lands, than on the more vague and troubleſome eſtimation of the quantities of ſtock they would winter, which indeed would be beſt calculated by the rental value of the land. Conſequently, in adopting this as the baſis of calculation, the ancient rule is in effect complied with.

But ſtill there is another circumſtance, he ſays, of ſome importance, which requires attention, before an equitable diſtribution can be made. For although each common right occupier may have a right to ſtock in proportion to the productiveneſs or rental value of his appropriated lands, every one could not do this with equal profit, and of courſe could not receive equal benefit. Lands ſituated on the ſide of a common, are much more beneficial in this reſpect, than lands which lie a mile or two from it, with bad roads between them. And it is the real advantage which an occupier can freely receive that is the true guide in the partition; which conſequently ought to be conducted, not on the rental value of the land, abſtractly conſidered, but on this and its ſituation with reſpect to the commonable lands, jointly. In other words, it is the rental values of the common right lands while the commons remain open, not what they will become after the commons are incloſed, which he conceives to be the proper ground-work of appropriation. And that in caſes where commonable lands are wholly attached to manors, and not common to the pariſh or townſhip in which they are ſituated, as in foreſts and woodland diſtricts, the ſelf-ſame principle of diſtribution is applicable. The remainder of the commons (after the owners of abſtract rights have been ſatisfied) belong to the common right lands and houſes, no matter whether ſuch lands and houſes belong to copyhold tenants excluſively, or to copyholders and freeholders jointly, provided the immemorial cuſtom of the manor make no diſtinction in their reſpective rights; the well eſtabliſhed cuſtoms of manors being in all caſes rules of conduct and unerring guides to commiſſioners."

With theſe, he ſuppoſes, end the great difficulties as to the principles of appropriation; the reſt he conſiders as merely technical; the works of admeaſurement, eſtimation, and calculation: operations that are familiar to profeſſional men in every diſtrict, and which require nothing but application and integrity to render them ſufficiently accurate. It is however a matter of vaſt importance to have perſons fully converſant with the ſubject as commiſſioners in all ſuch caſes.

Through the uncertainty and expence attending private acts, a great portion of theſe unſtinted common lands remain nearly as nature left them;—appearing in the preſent ſtate of civilization and ſcience, as blotches on the face of the country, eſpecially when ſeen under the threatening clouds of famine, which have now repeatedly overſpread it.

COMMON-*Field Land*, ſignifies a deſcription of land of a ſomewhat ſimilar kind to that of commons, only lying in extenſive fields. There is a large portion of this ſort of land in almoſt every county of the kingdom. It has been obſerved by Mr. Middleton, that the common arable fields in the county of Middleſex are about 20,000 acres; and in that, as well as in moſt other counties, are divided into too ſmall properties to be advantageouſly cultivated. He ſays he has known thirty landlords on a field of 200 acres; and the property of each ſo divided as to lie in ten or twenty places, containing from an acre or two downwards to fifteen perches; and in a field of 300 acres he has met with patches of arable land, containing eight perches each. In this inſtance the average ſize of all the pieces in the field was under an acre. In all caſes, he obſerves, they lie in long, narrow, winding, or worm-like ſlips. Land ſo diſtributed occaſions great loſs of time to the farmer, in removing his teams and labourers; and what is of equal importance, he can neither croſs-plough nor harrow and clean ſuch land in a workmanlike manner. And another great inconvenience attending common-field land is, the farmer cannot crop with that which beſt ſuits his ſoil, but is confined to ſow ſuch grain as muſt be cut with his neighbour's. An act to incloſe common-field land would be advantageous to the farmer, and make the eſtates compact, and of more value to the owners. Neither can he ſow any green or meliorating crops, vary the uſual impoveriſhing ſucceſſion, or even deſtroy the vermin. In ſhort, the cultivator of theſe lands finds his expences double, and his crops only half of what they might be, if the land were laid together and well fenced."

By incloſing the common-fields, ſays he, which conſiſt of a turnip and barley ſoil, both the landlord and the farmer are freed from the ſhackles of an exhauſting and obſolete rotation of crops, and placed at liberty to diſtribute for cultivation the ſoil in the moſt improved manner, keeping it clean, in better heart, raiſing ſuch roots and green crops as are in the greateſt demand at market, and only growing a crop of corn for the ſake of renewing the courſe of green and root crops. In this manner intelligent men, after incloſure, can double the produce of their land.

It is added that the invariable rotation of crops in all the common-fields is, firſt year a fallow, ſecond year wheat, third year peaſe or oats, then begin again with a fallow. This, he ſays, is the deſtructive ſyſtem of arable management that moſtly prevails in this kind of land, and by which ſome of the beſt land in the kingdom is condemned to be unemployed every third year; and the farmer who occupies it is compelled to pay three years rent in taxes, for two years uſe of it, and of courſe to maintain his family, ſervants, cattle, and implements of huſbandry, every third year, without having any return from the land. It is, therefore, impoſſible that lands of this ſort can ever be cultivated to the greateſt advantage, while they remain in their preſent ſtate. See INCLOSING.

It is obſerved by Mr. Marſhall that "abſurd as the common field ſyſtem is, in almoſt every particular, at this day, it was admirably ſuited to the circumſtances of the times in which it originated, the plan having been conceived in wiſdom and executed with accuracy as appears in numberleſs inſtances, even at this diſtance of time."

It is remarked that in the weſtern extreme of the iſland the common field ſyſtem has never, perhaps, been adopted; has certainly never been prevalent, as in the more central parts of England. There, a very different uſage would ſeem to have been early eſtabliſhed, and to have continued to the preſent time; when lords of manors have the privilege of letting off the lands of common paſtures, to be broken up for corn, the tenant being reſtricted to two crops; after which the land is thrown open again to paſturage. And it is at leaſt probable, that the lands of that country have been cleared from wood and brought into a ſtate of cultivation through ſimilar means. At preſent they are judiciouſly laid out, in farms of different ſizes, with ſquare ſtraight-lined incloſures, and with detached farm ſteads ſituated within their areas; the villages being generally ſmall and mean; the mere reſidence of labourers. Theſe are circumſtances which ſtrongly evince that the common field ſyſtem never took place in this part of the iſland, as it did in the more central parts.

But during the two laſt centuries, more particularly within the laſt, the feudal organization, having loſt its original baſis, has itſelf been mouldering away. A great majority of the appropriated common field lands and commons have been partially or wholly incloſed, either by piecemeal, each proprietor incloſing his own ſlip (a very inconvenient mode of incloſure); or by *general conſent*: the whole of the proprietors agreeing to commit their lands to the care and judgment of arbiters or commiſſioners; who, reſtoring the fields to their original intirety, reparcelled them out, in a manner more convenient to the ſeveral proprietors, and laid each man's portion, which had conſiſted of numberleſs narrow ſlips, in one or more well-ſhaped grounds, or by *acts of parliament*, whereby not only common fields, common meadows, and ſtinted paſtures, but unſtinted commons alſo, have been appropriated, by commiſſioners named in, or choſen in purſuance of, each reſpective act, who, throwing back the entire townſhip to its original ſtate, laid it out afreſh, according to the directions of the act and their own judgment.

COMMON *Field Huſbandry*, that ſort of cultivation which is practiſed in common fields. See HUSBANDRY. It has been obſerved in the "Agricultural Report of Wiltſhire," that the introduction of the common field huſbandry ſeems to have been very ſlow and progreſſive; and that the diſperſed ſituation and ſmallneſs of the pieces, of the common field lands now in cultivation, evidently ſhew that the occupiers began with tilling a ſingle acre, as one day's work for a plough, or perhaps only half an acre each; and that, as a want of corn increaſed, this cultivation was augmented until they had cultivated all that was moſt proper for that purpoſe, ſtill leaving thoſe parts which were leſs fit for the plough, or more diſtant from home, in a conſtant ſtate of commonage, but by mutual agreement keeping the cattle out of the cultivated parts till after harveſt. This was, probably, the origin of common fields. It does not ſeem probable, that any improved methods of cultivation can be adopted on common field lands, until the ſyſtem of common field huſbandry is aboliſhed. See COMMON and COMMON *Field Lands*.

COMMON *Meadows* and *Paſtures*, are ſuch meadows and paſtures as are held in a ſtate of commonage. It is remarked, by the author of the "Agricultural Survey of Wiltſhire," that, by the ſame kind of mutual agreement, as is ſtated in ſpeaking of common field lands, thoſe who have rights ſhut up, and in ſome caſes incloſed, ſuch parts of their common paſtures as were moſt proper to mow for hay, dividing them into certain ſpecific quantities, either by land-marks, or by lot, for mowing, and ſuffering the common herd of cattle to feed there again as ſoon as the hay was carried off, till it was time to lay them up for a new crop: and that this was the origin of common meadows. And that the mutual agreements, originally founded in neceſſity, became, when approved by the lords, and obſerved for a length of time by the tenants, what are called "cuſtom of manors," conſtituting the very eſſence of the court baron, or manorial court, by which both lord and tenants were and are ſtill bound; and of which, though the lord or his ſteward is the judge, the tenants are the jury, the cuſtom of the manor equally binding both.

COMMON, *Communis*, in a general ſenſe, ſomething that belongs to all alike; is owned or allowed by all; and is not confined to this more than that.

In which ſenſe, *common* ſtands oppoſed to *proper*, *peculiar*, &c. Thus, the earth is ſaid to be our *common* mother; in the firſt, or golden age, all things were in *common*, as well as the ſun and elements; the name animal is common to man and beaſt; that of ſubſtance to body and ſpirit. Philoſophers diſpute whether there be any ſuch thing as *common* notions, innate, or impreſſed on the mind by nature herſelf; or whether our ideas are all adventitious. See IDEA.

COMMON, *Communia*; (i. e. *quod ad omnes pertinet*) in *Law*, ſignifies that ſoil, the uſe whereof is *common* to a particular town or lordſhip: or it is a profit that a man hath in the land of another perſon, uſually in common with others; or a right or privilege, which one or more perſons claim to take or uſe, in ſome part or portion of that which another man's lands, waters, woods, &c. do naturally produce; without having an abſolute property in ſuch land, waters, wood, &c. It is called an "incorporeal right," which lies in "grant," as if originally commencing on ſome agreement between lords and tenants, for ſome valuable purpoſes; which by age being formed into a preſcription, continues, although there be no deed or inſtrument in writing which proves the original contract or agreement. 4 Co. 37. 2 Inſt. 65. 1 Vent. 387. And there is not only common of PASTURE, which the word "common," in its moſt uſual acceptation, ſignifies; but alſo *common* of PISCARY, *common* of ESTOVERS, *common* of TURBARY, &c. And in all caſes of *common*, the law doth much reſpect the cuſtom of the place: for there the rule is, *conſuetudo loci eſt obſervanda*. 7 Rep. 5.

COMMON *of paſture*, is a right of feeding one's beaſts on another's land; for in thoſe waſte grounds, uſually called commons, the property of the ſoil is generally in the lord of the manor; as in "common fields," it is in the particular tenants. This kind of common is divided into *common* in groſs, *common* appendant, *common* appurtenant, and *common per cauſe de vicinage*.

COMMON *in groſs*, is a liberty to have *common* alone, that is without any land or tenement in another man's land, granted either to a perſon for life or to him and his heirs. This is commonly paſſed by deed, or ſpecialty, and claimed by preſcriptive right.

Common *appendant*, and Common *appurtenant*, are uſually confounded; both being defined to be a liberty of *common* appertaining to, or depending on, ſuch or ſuch a freehold; which *common* muſt be taken with beaſts *commonable:* as horſes, oxen, &c. being accounted fitteſt for the plowman; and not with goats, geeſe, and hogs. Others diſtinguiſh between the two, thus; *common appurtenant* may be ſevered from the land whereto it appertains; and is where the owner of land has a right to put in other beaſts not *commonable;* as hogs, goats, &c. which neither plough nor manure the land. Whereas *common appendant*, according to lord Coke, had its original in the following manner:

"When a lord enfeoffed another in arable lands to hold of him in ſoccage; the feoffee, to maintain the ſervice of his plough, had at firſt, by courteſy of his landlord, *common* in his waſtes, for neceſſary beaſts to eat and compoſt his lands; and that for two cauſes; 1°. Becauſe it was tacitly implied in the feoffment; by reaſon the feoffee could not till, or compoſt his paſture: by conſequence, therefore, the feoffee had, as a thing neceſſary, or incident, *common* in the waſtes, or lands of the lord. 2°. For the maintenance and advancement of tillage."

Common appendant belongs only to ancient arable land, and not to a houſe, meadow, paſture, &c; and it is of common right. But it is not common appendant, unleſs it hath been appendant time out of mind. 1 Danv. 746. It may be upon condition; for all the year, or for a certain time, or for a certain number of beaſts, &c. by uſage; though it ought to be for ſuch cattle as plough and compoſt the land to which it is appendant. 1 Danv. 797. Common appendant may be to common in a field after the corn is ſevered, till the ground is reſown, and it may be to have common in a meadow after the hay is carried off, till Candlemas, &c. Yelv. 185. This common, which in its nature is not reſtricted by number, may be limited by cuſtom as to the beaſts; whereas common appurtenant ought always to be for thoſe levant and couchant, and may be *ſans* number. Plowd. 161. A man may preſcribe to have common appurtenant for all manner of cattle, at every ſeaſon in the year. 25 Aſſ. 8. He who hath common appendant or appurtenant can keep but a number of cattle proportionable to his land; for he can common with no more than the lands to which his common belongs is able to maintain. 3 Salk. 93.

Common *pur cauſe de vicinage*, i. e. by reaſon of neighbourhood, is the liberty that the tenants of one lord in one town, have to *common* with the tenants of another lord in another town.

But it is to be obſerved, that thoſe who claim this kind of *common*, (which is uſually called *intercommoning)* may not put their cattle into the *common* of the other lord, for then they are diſtrainable; but, turning them into their own fields, if they ſtray into their neighbour's *common*, they muſt be ſuffered.

The inhabitants of one town or lordſhip may not put in as many beaſts as they will, but with regard to the freehold of the inhabitants of the other; for otherwiſe it were no good neighbourhood, upon which all this depends. Terms de Ley. If one lord encloſes the common, the other town cannot then common; but though the common of vicinage is gone, common appendant remains. 4 Rep. 38. 7 Rep. 5. Every common pur cauſe de vicinage is a common appendant. 1 Danv. Abr. 799. This is indeed only a permiſſive right, intended to excuſe what in ſtrictneſs is a treſpaſs in both, and to prevent a multiplicity of ſuits. And therefore either townſhip may encloſe and bar out the other, though they have intercommoned time out of mind. Blackſt. Com. ii. 34.

The property of the ſoil in the "common" is entirely in the lord; and the uſe of it jointly in him and the commoners. Lords of manors may depaſture in commons where their tenants put in cattle: and a preſcription to exclude the lord is againſt law. 1 Inſt. 122. The lord may agiſt the cattle of a ſtranger in the common by preſcription; and he may licenſe a ſtranger to put in his cattle, if he leaves ſufficient room for the commoners. 1 Danv. 795. 2 Mod. 6. The lord may alſo ſurcharge, &c. an overplus of the common; and if, where there is not an overplus, the lord ſurcharge the common, the commoners are not to diſtrain his beaſts; but muſt commence an action againſt the lord. F. N. B. 125. The lord may diſtrain when the common is ſurcharged, and bring action of treſpaſs for any treſpaſs done in the common. 9 Rep. 113. A lord may make a pond on the common, though he cannot dig pits for gravel or coal; the ſtatutes of approvement extending only to incloſure. 3 Inſt. 204. 9 Rep. 112. 1 Sid. 106. If the lord makes a warren on the common, the commoners may not kill the conies; but are to bring their action, for they may not be their own judges. 1 Rol. 90. 405. By ſtatute of Merton (20 H. III. c. 4.) lords may "approve" againſt their tenants, *viz.* incloſe part of the waſte, &c. and thereby diſcharge it from being common, leaving common ſufficient; and neighbours as well as tenants, claiming common of paſture, ſhall be bound by it. If the lord incloſes on the common, and leaves not common ſufficient, the commoners may not only break down the incloſures, but may put in their cattle, although the lord ploughs and ſows the land. 2 Inſt. 88. 1 Rol. Abr. 406. By ſtat. 29 Geo. II. c. 36. Owners of commons, with the conſent of the majority, in number and value, of the commoners; the majority of the commoners, with conſent of the owners, or any perſons, with the conſent of both, may incloſe any part of a common for the growth of wood. If the wood be deſtroyed, the offender may be puniſhed according to ſtat. 1 Geo. 1. c. 48.; if not convicted in ſix months, the owner ſhall have ſatisfaction from the adjoining pariſhes, &c. as for fences overthrown by ſtat. Weſtm. 2. Perſons cutting wood on commons ſhall incur the ſame penalty. And by ſtat. 31 Geo. 2. c. 41, the recompence is to be paid to perſons intereſted, in proportion to their intereſt. A commoner hath only a ſpecial and limited intereſt in the ſoil, but yet he ſhall have ſuch remedies as are commenſurate to his right; and therefore he may diſtrain beaſts damage-feaſant, bring an action on the caſe, &c.; but not being abſolute owner of the ſoil, he cannot bring a general action of treſpaſs for a treſpaſs done upon the common. A commoner cannot do any thing on the ſoil which tends to the melioration or improvement of the common, as cutting down of buſhes, fern, &c. 1 Sid. 251. 12 Hen. VIII. 2. 13 Hen. VIII. 15. Therefore, if a common every year in a flood is ſurrounded with water, the commoner cannot make a trench in the ſoil to avoid the water, becauſe he has nothing to do with the ſoil, but only to take the graſs with the mouth of the cattle. 1 Rol. Abr. 405. 2 Bulſt. 116. Every commoner may break the common if it be incloſed; and although he does not put his cattle in at the time, yet his right of commonage ſhall excuſe him from being a treſpaſſer. Lit. Rep. 38. 1 Rol. Abr. 406. If a tenant of the freehold ploughs it, and ſows it with corn, the commoner may put in his cattle, and with them, eat the corn growing upon the land: ſo if he lets his corn lie in the field, beyond the uſual time, the other commoners may, notwithſtanding, put in their beaſts. 2 Leon. 202, 203. The commoner cannot uſe common except with his own proper cattle; but if he hath not cattle to manure the land, he may common other cattle to manure it, and uſe the common with them; for, by the loan, they are in a manner made his own cattle. 1 Danv. 798. A commoner may diſtrain beaſts put into the common by a ſtranger, or every commoner may bring action of the caſe, where damage is received. 9 Rep. 11. But one commoner cannot diſtrain the cattle of another commoner, though he may thoſe of a ſtranger, who hath no right to the common. 2 Lutw. 1238. See SURCHARGE *of Common,* and DISTURBANCE *of Common.*

Upon agreement between two commoners to incloſe a common, a party having intereſt, not privy to the agreement, will not be bound; but one or two wilful perſons ſhall not hinder the public good. Chan. Rep. 48. Commons muſt be driven yearly at Michaelmas, or within 15 days after; infected heifers and ſtone-horſes under ſize, &c. are not to be put into commons, under forfeiture, by ſtat. 32 Hen. VIII. c. 13. New erected cottages, though they have four acres of ground laid to them, ought not to have common in the waſte. 2 Inſt. 740. In law-proceedings, where there are two diſtinct commons, the two titles muſt be ſhewn: cattle are to be alleged commonable; and common ought to be in lands commonable; and the place is to be ſet forth where the meſſuage and lands lie, &c. to which the common belongs. 1 Nelſ. 462, 463. By ſtat. 13 Geo. III. c. 81. in every pariſh where there are "common field-lands," all the arable lands lying in ſuch fields ſhall be cultivated by the occupiers, under ſuch rules as three-fourths of them in number and value (with the conſent of the land and tithe-owners) ſhall appoint, by writing under their hands; the expence to be borne proportionably, under the management of a field-maſter, or field-reeve, to be appointed annually in May. For other particulars, ſee Jacob's Law Dict. by Tomlins.

COMMON, in *Geometry,* is applied to an angle, line or the like, which belongs equally to two figures, or makes a neceſſary part of both.

COMMON, in *Grammar,* denotes the gender of nouns which is equally applicable to both ſexes, male and female.

Such is that of *parens,* parent; which is either maſculine, or feminine, as it is uſed to ſignify either father, or mother.

The Latin grammarians, beſides this, which they call the *common of two,* alſo make a *common of three;* which extends to maſculine, feminine, and neuter.

COMMON, *Communis,* in *Ancient Muſic,* was an appellation given to the ſeventh ſpecies of the diapaſon. See DIAPASON.

COMMON *Bail.* See BAIL.

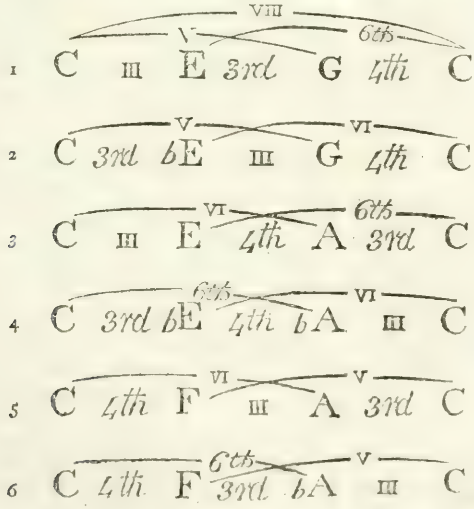
COMMON *Barretor.* See BARATRY.

COMMON *Bench.* The court of Common Pleas was anciently called *Common Bench,* becauſe the pleas of controverſies between common perſons were there tried and determined.

In law books and references, the court of Common Pleas is written C. B. from *communi banco,* or C. P.: and the juſtices of that court are ſtyled *juſticiarii de banco.* See COURT and *Common* PLEAS.

COMMON *Centre of Gravity,* in *Mechanics.* See CENTER *of Gravity.*

COMMON *Chord,* in *Muſic,* is ſometimes uſed to denote the third, fifth, and octave of any note, conſidered as a baſs. It will afford ſome light into the compoſition of chords, to exhibit all the poſſible variations in the order or arrangement of the concord, major *third* (III), minor *third* (3d), and minor *fourth* (4th), conſtituting the common chord in the following manner, *viz.*



the common chord.

the common chord minor.

the chord of ſixth, or $^{6}_{3}$.

the chord of $^{b6}_{b}$ or $^{b6}_{b3}$.

the chord of $^{6}_{4}$.

the chord of $^{b6}_{4}$.

By a compariſon of the ſeveral chords in the firſt arrangement above, it will appear, that when the four notes, C, E, G, and C, conſtituting the common chord, are ſounded together, all of the ſeven concords, viz. 3d, III, 4th, V, 6th, VI and VIII are in reality heard between the different notes, except the VI: and this circumſtance, combined with the III being above the baſs or loweſt note, ſeem eſſential to a full or common chord. In the ſecond arrangement, or C, $\flat$ E, G and C, it will be perceived, that all the concords are heard except the 6th; and this, combined with the third above the baſs note, conſtitutes the common chord of the minor mode. In the third arrangement, it will be ſeen, that there is no V produced, while a III occupies the place immediately above the baſs note, being the chord of ſixth. The fourth arrangement will alſo be found without a V, but with the 3d next the baſs, conſtituting the chord $^{\flat 6}_{\flat}$. The fifth arrangement will be found without a 6th, and with no third (but a 4th), next to the baſs, and this conſtitutes the chord $^{6}_{4}$. And laſtly, the ſixth arrangement will be found without a VI, or a third above the baſs, which conſtitutes the chord $^{\flat 6}_{4}$.

In performances by voices and perfect inſtruments, as violins, violincellos, &c. theſe ſeveral chords will be all heard *perfect;* and in each of the ſix caſes, a union or blending of the ſix concords, almoſt ſimilar to a ſingle ſound, will be perceived, but much more delightful to the ear; the characteriſtic differences of which conſtitute the character of the common chord and its five inverſions, as above. But upon the common keyed inſtruments, ſuch as organs, piano-fortes, harpſichords, &c. which contain but twelve ſounds within the octave, it is impoſſible that theſe ſingle or compound chords can all be heard perfect, but the greater part of the whole of them muſt be tempered or ſlightly altered from the true chord (ſee Temperament). If, for inſtance, the III C E above, were ſharpened ſeven ſchiſmas, or 7Σ, which is very nearly the caſe in *Equal Temperament* (which ſee), the 3d E G flattened 8Σ, and the 4th G C ſharpened Σ; the common chord, or firſt arrangement upon ſuch an inſtrument, would produce the following tempered concords, *viz.* $3d - 8\Sigma$, $III + 7\Sigma$, $4 + \Sigma$, $V - \Sigma$, and $6th - 7\Sigma$, combined with VIII; which chords, combined and blended, impreſs upon the ear the peculiar ſenſation of the common chord in this temperament. In the ſecond arrangement, or common chord minor, the effect produced will depend upon the union of the following tempered chords, viz. $3d - 8\Sigma$, $III + 7\Sigma$, $4th + \Sigma$, $V - \Sigma$, $VI + 8\Sigma$ and VIII. A common chord C E G C, upon an inſtrument tuned according to earl Stanhope's temperament, (ſee Philoſophical Magazine, vol. xxviii. p. 141) will be found to conſiſt of the following perfect chords, *viz.* 3d, III, 4th, V, 6th, and VIII; whence his lordſhip denominates his key of C major to be perfect (ſee Stanhope Temperament); but if we conſider the ſecond arrangement, or common chord of C minor, upon one of his lordſhip's inſtruments, we ſhall find $3d - 10\frac{1}{2}\Sigma$, $III + 10\frac{1}{2}\Sigma$, 4th, V, $VI + 10\frac{1}{2}\Sigma$, and VIII to conſtitute this chord, nearly, the very ſmall interval *minute* (*m*) only, being in any caſe omitted. Thus it will be eaſy to compare the effect of any inverſions of the common chord, in this, or any other temperament of the ſcale which may be propoſed.

Common *Clerk.* See Town *Clerk.*

Common *Crier.* See Crier.

Common *Council.* See *Mayor's* Courts.

Common *Day,* in plea of land, ſignifies an ordinary day in court, as *octabis Hilarii, quindena Paſchæ,* &c. It is mentioned in 13 Rich. II. ſtat. 1. cap. 17. and in the ſtatute 51 Hen III. concerning general days in bank. *Blount* and *Cowel.*

Common, *Diſturbance of.* See Disturbance *of Common.*

Common *Duct,* in *Anatomy.* See Ductus *Communis.*

Common, *Eſtate in.* See Estate.

Common *of Eſtovers.* See Estovers.

Common *Field-land.* See Common *ſupra.*

Common *Fine,* in *Law,* a certain ſum of money, which the reſiants within the liberty of ſome leets pay to the lord thereof; called in ſome places, *head-ſilver;* in others, *cert-money,* or *certum letæ,* and *head-pence.*

It was firſt granted to the lord towards the charge of his purchaſe of the court-leet; whereby the reſiants have now the conveniency of doing their ſuit within their own manors, without being compelled to go to the ſheriff's turn.

Common *in Groſs.* See Common *ſupra.*

Common *Hunt,* the chief huntſman belonging to the lord mayor and aldermen of London.

Common *Informer.* See Informer.

Common *Intendment,* in *Law,* the *common* underſtanding, meaning, or conſtruction of any thing: without ſtraining it to any foreign, remote, or particular ſenſe: and *Bar to Common Intendment,* is an ordinary, or general bar, which is commonly an anſwer to the declaration of the plaintiff. See Bar and Intendment.

Common *Jury.* See Jury.

Common *Law,* that body of rules generally received, and held as law in this nation, in contradiſtinction to the ſtatute, or written law, and including not only general cuſtoms, or the common law properly ſo called; but alſo the particular cuſtoms of certain parts of the kingdom, and likewiſe thoſe particular laws, that are by cuſtom obſerved only in certain courts and juriſdictions.

The common law is grounded upon the general cuſtoms of the realm, and comprehends the law of nature, the law of God, and the principles and maxims of the law: it is founded upon reaſon, and it is ſaid to be the perfection of reaſon, acquired by long ſtudy, obſervation, and experience, and refined by learned men in all ages. It is juſtly regarded as the common birth-right, which the ſubject has for the ſafe-guard and defence, not only of his goods, lands, and revenues, but of his wife and children, body, fame, and even life. Co. Litt. 97, 142. Treatiſe of Laws, p. 2. According to Hale, the common law of England is the common rule for adminiſtering juſtice within this kingdom, and aſſerts the king's royal prerogatives, and likewiſe the rights and liberties of the ſubject. It is, in general, that law by which the determinations in the king's "Ordinary courts" are guided; and this directs the courſe of deſcents of lands; the nature, extent, and qualifications of eſtates, together with the manner and ceremonies of conveying them from one to another; the forms, ſolemnities, and obligations of contracts; the rules and directions for the expoſition of deeds, and acts of parliament; the proceſs, proceedings, judgments, and executions of our courts of juſtice; alſo the limits and bounds of courts, and juriſdictions; the ſeveral kinds of temporal offences and puniſhments, and their application, &c. Hale's Hiſt. of the Common Law, p. 24—44, 45.

As to the origin of the common law, which, adopting the expreſſion of lord chief-juſtice Hale, is as undiſcoverable as the head of the Nile; our ancient lawyers, and particularly Forteſcue, warmly inſiſt, that the cuſtoms, which conſtitute our common law, are as old as the primitive Britons, and that they have been continued down, through the ſeveral mutations of government and inhabitants, to the preſent time, unchanged and unadulterated. This, ſays judge Blackſtone, may be the caſe as to ſome; but, in general, as Mr. Selden obſerves, this aſſertion muſt be underſtood with many grains of allowance; and ought only to ſignify, as the truth ſeems to be, that there never was any formal exchange of one ſyſtem of laws for another; though, doubtleſs, by the intermixture of adventitious nations, the Romans, the Picts, the Saxons, the Danes, and the Normans, they muſt have inſenſibly introduced and incorporated many of their own cuſtoms with thoſe that were before eſtabliſhed; thereby in all probability improving the texture and wiſdom of the whole, by the accumulated wiſdom of divers particular countries. Accordingly, lord Bacon obſerves, that our laws are as mixed as our language; and, as our language is ſo much the richer, the laws are the more complete. And, indeed, our antiquaries and early hiſtorians do all poſitively aſſure us, that our body of laws is of this compounded nature.

After the decay of the Roman empire, it has been ſaid, Britain became invaded by three kinds of German people, *viz.* the Saxons, Angles, and Jutes. From the Jutes deſcended the men of Kent, and thoſe of the Iſle of Wight; from the Saxons came the people called the Eaſt, South, and Weſt Saxons; and from the Angles came the Eaſt Angles, Mercians, and Northumbrians.

Now, as each people had its peculiar cuſtoms, ſo each inclined to different laws; whereof, thoſe of the Weſt Saxons and Mercians, who inhabited the midland counties, were, upon the diſſolution of the heptarchy, and eſtabliſhment of a monarchy, preferred to the reſt, and acquired the common appellation of *Jus Anglorum.* Their particular names were *Weſt Saxon-lage*, and *Merchen-lage.*

The firſt Saxon laws publiſhed in England were thoſe of king Ethelbert, in the ſixth century. Three hundred years after, king Alfred, whom our hiſtorians call *magnus juris Anglicani conditor*, having united the heptarchy, and rendered himſelf maſter of the whole nation, made a collection from among the numerous laws and cuſtoms of the ſeveral provinces of his domains, which were grown ſo various; and commanded them to be obſerved throughout his kingdom. This collection was denominated *folk-right*, and ſoon after the *common law*; as being *common* to the whole nation.

This was written in Alfred's *dome-book*, or *liber judicialis*, which was deſigned for the general uſe of the whole kingdom.

This book is ſaid to have been extant in the reign of king Edward IV.; but has ſince been unfortunately loſt. It contained, as we may reaſonably imagine, the principal maxims of the common law, the penalties for miſdemeſnors, and the forms of judicial proceedings.

By theſe laws the nation was governed for a conſiderable time, till, being at length ſubdued by the Danes, the cuſtoms of thoſe people were introduced, and incorporated with the reſt. Hence the code of Alfred in many provinces fell into diſuſe, or, at leaſt, was mixed and debaſed with other laws of a coarſer alloy: and thus a new form of *common* law aroſe, called *Dane-lage.*

The three ſyſtems of law above recited, viz. the *Dane-lage*, principally maintained in ſeveral of the midland counties and alſo on the eaſtern coaſt; the *Weſt Saxon-lage*, which was much the ſame with the code compiled by Alfred, and which obtained in the counties to the ſouth and weſt of the iſland, from Kent to Devonſhire, being the municipal law of the far moſt conſiderable part of Alfred's dominions, and particularly of Berkſhire, the ſeat of his peculiar reſidence; and the *Merchen-lage*, obſerved in many of the midland counties, and thoſe bordering on the principality of Wales, the retreat of the ancient Britons, and therefore probably intermixed with the Britiſh or Druidical cuſtoms; were in uſe about the beginning of the eleventh century. The northern provinces were at this time under a diſtinct government. In proceſs of time king Edgar begun what his grandſon Edward the Confeſſor, on this account called *legum Anglicanarum reſtitutor*, completed; *viz.* to form one digeſt or body of laws to be obſerved throughout the whole kingdom. This ſeems to have been only a new edition, or freſh promulgation of Alfred's *dome-book*, with ſuch additions and improvements as the experience of a century and a half had ſuggeſted.

The Danes being afterwards, in their turn, overcome by the Normans; the Conqueror, on a review of the ſeveral laws and cuſtoms that then obtained, abrogated ſome, and aboliſhed others; adding ſome of his own country laws.

His ſon, William Rufus, broke through the ancient laws and cuſtoms which his father had eſtabliſhed; but his next ſon, Henry I. excluded the civil cuſtoms which his brother had introduced, and reſtored the laws of Edward the Confeſſor, with thoſe amendments made by his father, under the advice of his barons. Theſe were afterwards confirmed in ſucceeding reigns.

Hence is derived that ſyſtem of maxims and unwritten cuſtoms, now known by the name of the *common law*, which is of Saxon parentage; though the cuſtoms and maxims themſelves are of higher antiquity than memory or hiſtory reach; many of them being as old as the primitive Britons. The name of common law was given to it; either in contradiſtinction to other laws, as the ſtatute law, the civil law, the law merchant, and the like; or, more probably, as a law common to all the realm, the *jus commune* or folk-right mentioned by king Edward the Elder, after the abolition of ſeveral provincial cuſtoms and particular laws.

The *common law* of England is, properly, the common cuſtoms of this kingdom; which, by length of time, have obtained the force of laws.

The goodneſs of a cuſtom depends upon its having been uſed time out of mind; or, in the ſolemnity of our legal phraſe, time whereof the memory of man runneth not to the contrary. This gives it its weight and authority; and of this nature are the maxims and cuſtoms which compoſe the common law, or *lex non ſcripta*, of this kingdom. This unwritten, or common law, is properly diſtinguiſhed into three kinds; 1. General cuſtoms, which are the univerſal rule of the whole kingdom, and form the common law, in its ſtricter and more uſual ſignification. 2. Particular cuſtoms, which for the moſt part affect only the inhabitants of particular diſtricts. 3. Certain particular laws; which by cuſtom are adopted and uſed, by ſome particular courts, of pretty general and extenſive juriſdiction. See CUSTOM.

Some have divided the common law into two principal grounds or foundations; *viz.* 1. Eſtabliſhed cuſtoms; ſuch as that, where there are three brothers, the eldeſt brother ſhall be heir to the ſecond, in excluſion of the youngeſt; and, 2. Eſtabliſhed rules and maxims; as, that the king can do no wrong; that no man ſhall be bound to accuſe himſelf; and the like. But judge Blackſtone obſerves, that theſe are one and the ſame thing. For the authority of theſe maxims reſts entirely upon general reception and uſage; and the only method of proving, that this or that maxim is a rule of the common law, is by ſhewing that it hath been always the cuſtom to obſerve it. See CUSTOM.

It is called *lex non ſcripta*, the *unwritten law*: not but that we have moſt of it written in the old Norman dialect, and the monuments and evidences of our legal cuſtoms are contained in the records of the ſeveral courts of juſtice, in books of reports and judicial deciſions, and in the treatiſes of learned ſages of the profeſſion, preſerved and tranſmitted from times of the higheſt antiquity; but becauſe it does not appear to be made by charter, or parliament; for thoſe are always matters of record. Its original inſtitution and authority are not ſet down in writing, but it receives its binding power and the force of law, by long and immemorial uſage, and by univerſal reception through the kingdom. See AUTHORITIES and REPORTS.

Beſide the *common law* of England in general, there are in divers parts of the nation particular cuſtoms, and common uſages, which have the force of *common law* among thoſe people, who have retained them: ſuch as the Borough-Engliſh, Gavel-kind, &c.—Where the *common law* is ſilent, there the STATUTE-*law* ſpeaks. See STATUTE.

All trials at *common law* are by a jury of twelve men.

Among the ancient and moſt eminent writers on common law we may ſelect and enumerate the following. Britton wrote his learned book of the common law of this realm by the king's command, and it runs in his name, correſponding to the inſtitutions of the civil law, which Juſtinian aſſumes to himſelf, though compoſed by others under his direction. This Britton is mentioned by Gwin to have been biſhop of Hereford. Bracton, a great lawyer in the time of Henry III., wrote a very learned treatiſe of the common law of England, held in great eſtimation; and he was ſaid to be lord chief-juſtice of the kingdom. The famous and learned Glanvil, lord chief-juſtice in the reign of Henry II., wrote a book of the common law, which is ſaid to be the moſt ancient compoſition extant on that ſubject. Beſides theſe, in the time of Edward IV. the renowned lawyer Littleton wrote his excellent book of "Engliſh Tenures." In the reign of king James I., the great oracle of the law, ſir Edward Coke publiſhed his learned and laborious "Inſtitutes" of our law, and commentary on Littleton. About the ſame time likewiſe Dr. Cowel, a civilian, wrote a ſhort inſtitute of our laws. In the reign of king George I., Dr. Tho. Wood, a civilian and common lawyer, and at laſt a divine, wrote an inſtitute of the laws of England, ſomewhat after the manner of the Inſtitutes of the civil law. And to mention no others, the late learned judge Blackſtone, in the reign of George III., publiſhed his "Commentaries" on the laws of England, the beſt analytic and moſt methodical ſyſtem of our laws, which was ever publiſhed; and equally adapted for the uſe of ſtudents, and of thoſe gentlemen who wiſh to acquire that knowledge of our laws, which is, in fact, eſſentially neceſſary for every one. See biographical articles BRITTON, BRACTON, &c. &c.

COMMON *meaſure diviſor*, in *Arithmetic*, a number that exactly meaſures two other numbers, without a remainder. And the greateſt number that can meaſure any two other numbers, is called their greateſt common meaſure; thus 4 is the greateſt common meaſure of 8 and 12.

To find the greateſt common meaſure of two numbers; divide the greater by the leſs, and if there be no remainder, the leſs number is the meaſure required. If there be a remainder, divide the laſt diviſor by it, and thus proceed, till there be no remainder left, and the laſt diviſor is the greateſt common meaſure.

E. G. To find the greateſt common meaſure of 816 and 1488.

816)1488(1
816

672)816(1
672

144)672(4
576

96)144(1
96

Common meaſure - 48)96(2
96

0

For algebraic quantities, the remainders are to be divided by their ſimple diviſors, and the quotients will be the quantities required.

E. G. Let the quantities be $a^2 + 2ab + b^2$ and $a^3 + 2a^2b + 2ab^2 + b^3$.

Divide the latter of theſe by the former in the following manner:

$$a^2 + 2ab + b^2)a^3 + 2a^2b + 2ab^2 + b^3(a$$
$$\underline{a^3 + 2a^2b + ab^2}$$

The remainder is - - - $+ ab^2 + b^3$, which being divided by b^2, its greateſt ſimple diviſor, given $a + b$; and by this divide $a^2 + 2ab + b^2$, and the quotient will be $a + b$, exactly, which is the common meaſure required. And if fractions are divided by their greateſt common meaſure, they will thus be reduced to their loweſt terms.

E. G. Let the fraction be $\frac{816}{1488}$: then divide the numerator and denominator by 48, the greateſt common meaſure, and the fraction will be reduced to $\frac{17}{31}$, its loweſt terms. Let the algebraic fraction be $\frac{a^2 + 2ab + b^2}{a^3 + 2a^2b + 2ab^2 + b^3}$; then, dividing the numerator and denominator by $a + b$ the greateſt common meaſure; and it will be reduced to $\frac{a + b}{a^2 + ab + b^2}$, its loweſt terms.

Theſe operations are founded on this principle, *viz.* that whatever quantity meaſures the whole and one part of another, muſt alſo meaſure the remaining part. For that quantity (whatever it is) which meaſures both the diviſor and dividend, muſt evidently meaſure $a^3 + 2ab + b^2$, being a multiple of the former; whence, by the above-cited principle, the ſame quantity, as it increaſes the whole dividend, muſt alſo meaſure the remaining part of it, $ab^2 + b^3$: but the diviſor, which we are ſeeking, being a compound one, we may caſt off the ſimple diviſor b^2, as not anſwering our purpoſe; whence $a + b$ appears to be the only compound diviſor which the caſe admits of; and this muſt be the common meaſure required, if the propoſed example admits of any ſuch.

COMMON, *Month*, *Motion*, *Nuiſance*, and *Object*. See the SUBSTANTIVES.

COMMON of *Paſture*. See PASTURE and COMMON.

COMMON of *Piſcary*. See PISCARY.

COMMON-PLACE *Book*, *Adverſaria*, among the learned, denotes a regiſter, or orderly collection of things which occur worthy to be noted, and retained in the courſe of a man's reading, or ſtudy; ſo diſpoſed, as that among a multiplicity of ſubjects, any one may be eaſily found.

Common-place-books are of great ſervice: they are a kind of promptuaries or ſtorehouſes, wherein to repoſit the moſt valuable parts of authors, to be ready at hand when wanted. Several perſons have their ſeveral methods of ordering them: but that which comes beſt recommended, is the method of that great maſter of order Mr. Locke. He has thought fit to publiſh it in a letter to M. Toiſnard; determined thereto, by the great conveniency and advantage he had found from it in twenty years experience; as well as by the recommendations and intreaties of many of his friends, who had likewiſe proved it.

The ſubſtance of this method we ſhall here give the reader; whereby he will be eaſily enabled to execute it himſelf.

The firſt page of the book you intend to take down the *common-places* in, is to ſerve as a kind of index to the whole; and to contain references to every place, or matter therein: in the commodious contrivance of which index, ſo that it may admit of a ſufficient copia, or variety of materials, without any confuſion, the whole ſecret of the method conſiſts.

In order to this the firſt page, as already mentioned, or for more room, the two firſt pages that front each other, are to be divided by parallel lines, into twenty-five equal parts; whereof every fifth line is to be diſtinguiſhed, by its colour, or ſome other circumſtance. Theſe lines are to be cut perpendicularly by others, drawn from top to bottom; and in the ſeveral ſpaces thereof the ſeveral letters of the alphabet, both capital and minuſcule, are to be duly written. The form of the lines and diviſions, both horizontal and perpendicular, with the manner of writing the letters therein, will be conceived from the following ſpecimen; wherein what is to be done in the book for all the letters of the alphabet, is here ſhewn in the firſt four, A, B, C, and D.

A	a		C	a	
	e			e	
	i			i	
	o			o	
	u			u	
B	a		D	a	
	e			e	
	i			i	
	o			o	
	u			u	

The index of the common-place book being thus formed, matters are ready for the inſertion of any thing in it. In order to this, conſider to what head, the thing you would enter is moſt naturally referred; in this head, or word, regard is had to the initial letter, and the firſt vowel that follows it; which are the characteriſtic letters on which the whole uſe of the index depends.

Suppoſe, *e. gr.* I would enter down a paſſage that refers to the head *beauty;* B, I conſider, is the initial letter, and *e* the firſt vowel; then looking upon the index for the partition B, and therein the line *e* (which is the place for all words whoſe firſt letter is B, and firſt vowel *e;* as *Beauty*, *Beneficence*, *Bread*, *Bleeding*, *Blemiſhes*, &c.), and finding no numbers down already to direct me to any page of the book where words of this characteriſtic have been entered, I turn forward to the firſt blank page I find, which in a freſh book, as this is ſuppoſed to be, will be page 2, and here I now write what I have occaſion for on the head *beauty;* beginning the head in the margin, and indenting all the other ſubſervient lines, that the head may ſtand out, and ſhew itſelf; this done, I enter the page where it is written. *viz.* 2, in the index, in the ſpace B *e*, from which time, the claſs B *e* becomes wholly in the poſſeſſion of the 2d and 3d pages, which are conſigned to letters of this characteriſtic.

Had I found any page or number already entered in the ſpace B *e*, I muſt have turned to the page, and have written my matter in what room was left therein: ſo, if after entering the paſſage on beauty, I ſhould have occaſion for *benevolence*, or the like, finding the number 2 already poſſeſſed of the ſpace of this characteriſtic, I begin the paſſage on benevolence in the remainder of the page; which not containing the whole, I carry it on to page 3, which is alſo for B *e*, and add the number 3 in the index. When the two pages deſtined for one claſs are full, look forward for the next backſide that is blank; if it be that which immediately follows, write at the bottom of the margin of the page filled, the letter *v* for *verte*, turn over; and the ſame at the top of the next page: and continue from this new page as before. If the pages immediately following be already filled with other claſſes, then write at the bottom of the page laſt filled, the letter *v*, with the number of the next blank page; and at the top of that page, the number of the page laſt filled; then entering that head in this new page, proceed as before. By theſe two numbers of reference, the one at the top, and the other at the bottom of the page, the diſcontinued matters are again connected. It may not be amiſs, every time you put a number at the bottom of a page, to put it likewiſe in the index. Now, if the head be a monoſyllable beginning with a vowel, the vowel is at the ſame time both the initial letter, and the characteriſtic vowel: thus the word *art* is to be wrote in A *a*. Mr. Locke omits three letters of the alphabet in his index, *viz.* K, Y, and W; which are ſupplied by C, I, U, equivalent to them: and as for Q, ſince it is always followed by an *u*, he puts it in the fifth place of Z; and ſo has no Z *u*, which is a characteriſtic that very rarely occurs. By thus making Q the laſt in the index, its regularity is preſerved, without diminiſhing its extent. Others chooſe to retain the claſs Z *u*, and aſſign a place for Q *u* below the index.

If any imagine, that thoſe hundred claſſes are not ſufficient to comprehend all kinds of ſubjects without confuſion, he may follow the ſame method, and yet augment the number to five hundred, by taking in one more characteriſtic to them.

But the inventor aſſures us, that in all his collections, for a long ſeries of years, he never found any deficiency in the index as above laid down. Other contrivances for commonplace books have been propoſed; but they are ſuch as will naturally occur to perſons converſant with the ſubject, and accuſtomed to orderly arrangement: and it is, therefore, needleſs to extend this article.

Common *Places, in Rhetoric.* See Arguments and Topics.

Common Pleas. See Court *of Common Pleas.*

Common *Prayer*, is the liturgy of the church of England. Clergymen are obliged to uſe this liturgy in the ſervice of the church; and refuſing to do ſo, or uſing any other public prayers, is puniſhable by 1 Eliz. cap. 2. and every incumbent reſiding on his living and keeping a curate, is obliged, once every month at leaſt, to read the common prayer in his pariſh church, in his own perſon, under a forfeiture of 5*l.* for every failure, by the act of uniformity, 13 and 14 Car. II. cap. 4.; and by the ſame ſtat. every church is to be provided with a book of common prayer, under the penalty of 3*l.* a month, and the common prayer is to be read before every lecture. Every miniſter who ſpeaks any thing in derogation of this book ſhall, if not beneficed, be impriſoned one year for the firſt offence, and for life for the ſecond; and, if he be beneficed, he is liable to ſix months impriſonment, and the forfeiture of a year's value of his benefice; for the ſecond offence to deprivation and one year's impriſonment; and for the third offence to deprivation and impriſonment for life: and any perſon convicted of reviling it in plays, ſongs, or other open words, or of forcibly preventing its being read, or of cauſing any other ſervice to be read in its ſtead, ſhall forfeit for the firſt offence an hundred marks; four hundred for the ſecond; and for the third offence all his goods and chattels, and ſuffer impriſonment for life. Stat. 1 Eliz. cap. 2. See Liturgy.

Common *Receptacle.* See Receptaculum.

Common *Recovery.* See Recovery.

Common, *Right of.* See Common.

Common *Scold.* See Scold.

Common *Seal.* See Seal.

Common *Senſe.* See Sense.

Common *Senſory.* See Sensory.

Common *Serjeant.* See Serjeant.

Common, *Surcharge of.* See Surcharge.

Common, *Tenants in.* See Tenant.

Common *Time.* See Time.

Common *Voucher.* See Voucher.

Common *Ways,* See Way.

Common *Weal* denotes "bonum publicum," or the public good, and is much favoured in our laws; and therefore many things are legally tolerated, with a view to the public good, which otherwiſe might not be done. Hence it is that monopolies are void in law, and that bonds and covenants to reſtrain free trade, tillage, and the like, are adjudged void. 11 Co. Rep. 50. Plowd. 25. Shep. Epit. 270.

Common *Year.* See Year.

COMMONABLE Lands, in *Agriculture*, are ſuch lands as are generally in ſome meaſure arable, and which belong, in property, to individuals who are known, and the limits of whoſe property are aſcertained: but which, in regard to their culture and mode of cropping, are ſubject to certain regulations, which cuſtom, for time immemorial, has eſtabliſhed, ſo as gradually to have acquired the force of law, to which rules every individual occupying ſuch property muſt adhere, until theſe old cuſtoms ſhall be abrogated, either by the unanimous conſent of all the individuals having a right to ſuch commonable lands, or by an expreſs ſtatute, obtained with their conſent, for the purpoſe of annulling them. In ſome countries, Dr. Anderſon ſays, it appears that not much leſs than one half of the whole arable lands are in this ſtate; although it is evident, by the concurring teſtimony of all the agricultural reports, that taking all theſe lands at an average, they do not afford half the produce the ſame lands would do, if they were put under the ordinary management that appropriated farmers are ſubjected to in their reſpective diſtricts: and not perhaps one tenth part of what they might eaſily be made to afford, within a very ſhort period of time, ſhould all other obſtructions to improvement be removed. It would be tireſome, he ſays, to enumerate all the facts that occur in the different agricultural ſurveys, tending to point out the pernicious tendency of this mode of tenure: but a few of them may be mentioned. In one place it is ſtated, that a few incloſures had been made, ſeemingly with the concurrence of all the parties concerned; but when the hedges had advanced nearly to become a fence, one of the commonable tenants went deliberately and pulled them up by the roots, and eradicated them entirely. In another caſe the pariſhioners having come to an agreement to ſow clover, after that practice had been univerſally acquieſced in for the ſpace of eighteen years, one of the farmers, occupying ſixteen acres of land, bought a large ſtock of lean ſheep in the month of May, and turned them on the clover crops, which were nearly in bloom, and no one could hinder him. In another caſe, where cuſtom had eſtabliſhed the practice of having one corn crop, and one fallow, alternately, the occupiers of the diſtrict came to an agreement to have two crops and a fallow alternately; but before the expiration of ten years, one of the farmers broke through the agreement, and turned his cattle upon the crops of beans, oats, and barley: in which plan he was followed by the reſt of his neighbours; and the crops were, in conſequence, totally deſtroyed on that part of the field, which, agreeable to the ancient cuſtom, ſhould have been that year in fallow. Theſe notices, while they tend to illuſtrate the nature of this particular kind of tenure, at the ſame time, he ſays, clearly demonſtrate its pernicious tendency to the public. No one, who has conſidered the ſubject for a moment, but will readily admit, that it were much for the intereſt of Britain that no ſuch practice exiſted in it: and that, of courſe, no time ſhould be loſt in endeavouring to eradicate it; for, were this effectually done, it muſt appear evident from the facts ſtated, that the total produce of the kingdom would be greatly augmented and improved. See Common.

COMMONALTY, comprehends one diſtinction of the civil ſtate; the nobility being the other; and like the nobility, includes ſeveral degrees of rank and condition. In Art. ſuper Chartas, 28 Ed. 1. c. 1., the words "Tout le commune de l'Engleterre," ſignify all the people of England. 2 Inſt. 539. But the term is generally uſed for the middle rank of the king's ſubjects, ſuch of the commons as are raiſed above the ordinary ſort, and having the management of offices, are by that means one degree below burgeſſes, who are ſuperior to them in order and authority:—and companies incorporated are ſaid to conſiſt of maſters, wardens, and commonalty, the firſt two being the chief, and the others ſuch as are uſually called of the livery. The ordinary people, and freeholders, or at beſt knights and gentlemen, under the degree of baron, have been, of late years, called "communitas regni," or "tota terræ communitas;" yet anciently, if we credit Brady, the barons and tenants in capite, or military men, were the community of the kingdom, and thoſe only were reputed as ſuch in our moſt ancient hiſtories and records. Brady's Gloſſ. to his Introd. to Eng. Hiſt.

COMMONE, in *Ancient Geography*, the name of an iſland in the Mediterranean, placed by Pliny on the coaſt of Ionia.

COMMONER, is uſed for a ſtudent in ſome univerſities, entered in a particular rank.

The word is alſo applied to a member of the houſe of commons, in contradiſtinction to a peer.

COMMONI, in *Ancient Geography*, a denomination given by Ptolemy to a people of Gallia Narbonnenſis, who inhabited the country, including the town of Tauroentium, the promontory of Cithariſtes, the town of Olbia, that of Forum Julii, &c.

COMMONS, in a general ſenſe, conſiſt of all ſuch men of property in the kingdom, as have not ſeats in the houſe of lords; every one of whom has a voice in parliament, either perſonally, or by his repreſentatives. In a free ſtate, ſays judge Blackſtone, every man, who is ſuppoſed a free agent, ought to be in ſome meaſure his own governor; and, therefore, a branch at leaſt of the legiſlative power ſhould reſide in the whole body of the people. And this power, when the territories of the ſtate are ſmall, and its citizens eaſily known, ſhould be exerciſed by the people in their aggregate or collective capacity; as was wiſely ordained in the petty republics of Greece, and the firſt rudiments of the Roman ſtate. But this will be highly inconvenient, when the public territory is extended to any conſiderable degree, and the number of citizens is increaſed. Thus when, after the Social war, all the burghers of Italy were admitted free citizens of Rome, and each had a vote in the public aſſemblies, it became impoſſible to diſtinguiſh the ſpurious from the real voter, and from that time all elections and popular deliberations grew tumultuous and diſorderly; which paved the way for Marius and Sylla, Pompey and Cæſar, to trample on the liberties of their country, and at laſt to diſſolve the commonwealth. In ſo large a ſtate as ours, it is therefore wiſely contrived, that the people ſhould do that by their repreſentatives, which it is impracticable to perform in perſon; repreſentatives choſen by a number of minute and ſeparate diſtricts, wherein all the voters are, or eaſily may be, diſtinguiſhed.

Commons, in parliament, are the lower houſe, conſiſting of knights elected by the counties, and of citizens and burgeſſes by the cities and borough-towns. See Borough, Burgess, and Knight.

In theſe elections, anciently, all the people had votes; but in the 8th and 10th of king Henry VI. for avoiding tumults, laws were enacted, that none ſhould vote for knights but ſuch as were freeholders, did reſide in the county, and had forty ſhillings yearly revenue; equivalent to near 20*l.* a year of our preſent money: the perſons elected for counties to be *milites notabiles*, at leaſt eſquires, or gentlemen fit for knighthood; native Engliſhmen, at leaſt naturalized; and twenty-one years of age: no judge, ſheriff, or eccleſiaſtical perſon, to ſit in the houſe for county, city, or borough.

The *houſe of commons*, in Forteſcue's time, who wrote during the reign of Henry VI. conſiſted of upwards of 300 members: in ſir Edward Coke's time their number amounted to 493. At the time of the union with Scotland, in 1707, there were 513 members for England and Wales, to which 45 repreſentatives for Scotland were added; ſo that the whole number of members amounted to 558.

In conſequence of the union with Ireland, in 1801, 100 members were added for that country; and the whole houſe of commons now conſiſts of 658 members: *viz.* 80 knights for 40 counties in England; 50 citizens for 25 cities (Ely ſending none, and London four); 334 burgeſſes for 167 boroughs, and 5 burgeſſes for 5 boroughs, *viz.* Abingdon, Banbury, Bewdley, Higham Ferrers, and Monmouth; 4 burgeſſes for the two univerſities of Oxford and Cambridge; 16 barons for the 8 cinque-ports, *viz.* Haſtings, Dover, Sandwich, Romney, Hythe, and their three branches, Rye, Winchelſea, and Seaford; 12 knights for 12 counties in Wales; 12 burgeſſes for 12 boroughs in that country; 30 knights for the ſhires of Scotland, and 15 burgeſſes for its boroughs; 64 knights and 36 burgeſſes for Ireland. For an account of the privileges of members of the houſe of commons, and other particulars, ſee Parliament.

Commons is alſo uſed in oppoſition to *nobles* or *peers*, viz. for all ſorts of perſons under the degree of a baron; including the orders of knights, eſquires, gentlemen, the ſons of the nobility, and yeomen. See each under its proper article, Esquire, Gentleman, Yeoman, &c.

Commons, *Doctors*. See College *of Civilians*.

Commons, *Proctor of the*. See Proctor.

Commons is alſo uſed for the ſtated and ordinary diet, or eating, of a college, inn of court, or other ſociety. See Inn, &c.

COMMONWEALTH. See Republic.

Commonwealth *of England*, in *Hiſtory*, a form of government introduced after the diſſolution of the monarchy by the death of Charles I., in 1649. The change of government ſeems to have been ſuggeſted in the preceding year by a council of officers, who took into conſideration a ſcheme called "The Agreement of the People;" being the plan of a republic to be ſubſtituted in the place of that government which they were demoliſhing; but the commonwealth was not eſtabliſhed till after the tragical event of the king's death. Soon after this event, the houſe of commons publiſhed an act to forbid the proclamation of Charles Stewart, eldeſt ſon of the late king, or any other perſon, on pain of high treaſon. On the ſame day the lords deſired a conference with the commons about ſettling the government and the adminiſtration of juſtice, the commiſſions of the judges having been determined by the king's death. The commons, without anſwering the meſſage, voted the houſe of lords to be uſeleſs and dangerous, and therefore to be aboliſhed. They only left the lords the privilege of being elected members of parliament, in common with other ſubjects. Thus, the parliament, which at firſt was compoſed of the king, 120 lords, and 513 commoners, was reduced to a houſe of commons, conſiſting of about 80 members, few of whom at the beginning had 500*l.* yearly income. Nevertheleſs, theſe few and inconſiderable members aſſumed the name of a parliament, and acted as if their body had been inveſted with the authority, which had before reſided in the king, lords, and commons. But they were previouſly diſpoſed and prepared for the buſineſs which they undertook to execute, and they were awed and ſupported by an army of near 50,000 men, formidable from its diſcipline and courage, as well as its number, and actuated by a ſpirit that rendered it dangerous to the aſſembly, which had aſſumed the command over it. It muſt be confeſſed, however, that in this parliament there were ſome men of diſtinguiſhed capacity and integrity, and that if they adopted erroneous principles, or purſued thoſe that were juſt and reaſonable to an unwarrantable extent, they were deſtitute neither of talents nor of influence to defend and ſupport them. The ſovereign authority, as they maintained, reſided originally in the people, by whom a part of it was committed to the kings, choſen to govern them according to law; and they alleged, that the king's abuſe of this truſt had broken the original contract between king and people, and that, in conſequence of this violation, the contract ſubſiſted no longer, but the ſovereign power reverted to the people, as to its original ſource. Conſidering themſelves as the repreſentatives of the people, they conceived that they had a right to change the form of the government, without any regard to the original contract annulled by the king in his violation of the laws. Upon theſe principles, the commons, aſſuming the name of parliament, voted, and afterwards enacted, that the kingly office ſhould be aboliſhed as unneceſſary, burdenſome, and dangerous, and that the ſtate ſhould be governed by the repreſentatives of the people in a houſe of commons without king or lords, and under the form of a commonwealth. The former oaths of allegiance and ſupremacy were aboliſhed, and a new oath was prepared, called "The Engagement," by which every man ſwore, that he would be true and faithful to the government eſtabliſhed, without king or peers. Juſtice was no longer to be adminiſtered in the king's name, but the name, ſtyle, and teſt of the writs were to be, "cuſtodes libertatis Angliæ, authoritate parliamenti;" a new great ſeal was to be made; new money to be coined; and, in a word, every thing was to be ſet aſide and aboliſhed, that bore any marks of royalty. A great ſeal was therefore made, on one ſide of which was ſeen the parliament ſitting, with this inſcription: "the great ſeal of the parliament of the commonwealth of England;" and on the other ſide, the arms of England and Ireland, with theſe words, "the firſt year of freedom by God's bleſſing reſtored." This ſeal was committed to a certain number of perſons, who were ſtyled "keepers of the liberties of England." And it was ordained, that, for the future, all public orders ſhould be diſpatched in the name of theſe keepers, under the direction of the parliament. The parliament alſo made choice of 39 perſons to form a council of ſtate for the adminiſtration of public affairs under the parliament; to this council all addreſſes were made; they gave orders to all generals and admirals, executed the laws, and digeſted all buſineſs before it was brought into parliament. They profeſſed to employ themſelves entirely in adjuſting the laws, forms, and plan of a new repreſentation; and as ſoon as they ſhould have ſettled the nation, they avowed their intention of reſtoring the power to the people, from whom, they acknowledged, they had wholly derived it. The parliament alſo erected a high court of juſtice, conſiſting of 60 members, to try ſome perſons of diſtinction, who were in their power. The commonwealth, thus formed and eſtabliſhed, found England compoſed into a ſeeming tranquillity by the terror of its arms. Foreign powers, occupied in wars among themſelves, had no leiſure nor inclination to interpoſe in the domeſtic diſſenſions of this iſland. The young king, poor and neglected, living ſometimes in Holland, ſometimes in France, ſometimes in Jerſey, indulged the hope, among his preſent diſtreſſes, of better fortune at ſome future period. The ſituation alone of Scotland and Ireland occaſioned any immediate inquietude to the new republic. As to the Scots, they were allowed for the preſent to take their own meaſures in ſettling their government; but Ireland demanded more immediately their efforts for ſubduing it. Cromwell, having obtained the appointment of lieutenant in that country by his intereſt in the council of ſtate, loſt no time in paſſing thither; and he proceeded with ſuch uninterrupted ſucceſs, that in the ſpace of nine months he had almoſt entirely ſubdued it. Afterwards, leaving the command of Ireland to Ireton, who governed that kingdom in the character of deputy, he haſtened home, and was declared captain-general of all the forces in England. Having received this honourable appointment, he immediately marched his forces and entered Scotland; where Charles, who had been invited thither, was making conſiderable progreſs, with an army of 16,000 men. Cromwell having gained a deciſive victory over the Scots in the battle of Dunbar, and having taken poſſeſſion of Edinburgh and Leith, followed the young prince in his march into England, and falling in with an army of about 30,000 men in the city of Worceſter, he either killed or took priſoners the whole Scottiſh army, and obliged the king to fly; and at length to make his eſcape from Shoreham in Suſſex, to Feſcamp in Normandy. The ruling members of the commonwealth were deſtitute of thoſe comprehenſive views which might qualify them for acting the part of legiſlators. They made ſlow progreſs in the work to which they profeſſed themſelves devoted, that of ſettling a new model of repreſentation and fixing a plan of government. The nation therefore began to apprehend, that they intended to eſtabliſh themſelves as a perpetual legiſlature, and to confine the whole power to 60 or 70 perſons, who called themſelves the parliament of the commonwealth of England. However, the republicans, by the turn of their diſpoſition, and by the nature of the inſtruments which they employed, ſhewed themſelves better qualified for acts of force and vigour than for the ſlow and deliberate work of legiſlation. Notwithſtanding the diſtreſſed ſtate of the kingdom, occaſioned by contending factions and by the devaſtation of civil wars, the power of England had never, in any period, appeared ſo formidable to the neighbouring kingdoms as it did at this time, in the hands of the commonwealth. A numerous army ſerved equally to retain every one in implicit ſubjection to eſtabliſhed authority, and to ſtrike a terror into foreign nations. The power of peace and war was lodged in the ſame hands with that of impoſing taxes. The military genius of the people had, by the civil conteſt, been rouzed from its former lethargy; and excellent officers were formed in every branch of ſervice. The confuſion into which all things had been thrown, had given opportunity to men of low ſtations to work through their obſcurity, and to raiſe themſelves by their courage to commands which they were well qualified to exerciſe, but to which their birth could never have entitled them. And while ſo great a power was lodged in ſuch active hands, it is no wonder that the republic was ſucceſsful in all its enterprizes.

Notwithſtanding all the ſucceſſes that attended the military operations of the commonwealth, both by ſea and land, ſome circumſtances occurred which widened the breach that had ſubſiſted for a conſiderable time between the parliament and the army. Cromwell alſo ſaw that the zealous republicans in the government entertained a jealouſy of his power and ambition, and were reſolved to bring him to a ſubordination under their authority. He, therefore, without ſcruple or delay, determined to prevent them. Accordingly he called a council of officers, under the pretence of expediting the eſtabliſhment of that free and equal government which parliament had ſo long promiſed to the people. In this council Cromwell had many friends, and alſo ſome opponents. The meaſure which he propoſed was debated by the officers; and during the debate, Cromwell received information, that the parliament was ſtill ſitting, and had come to a reſolution not to diſſolve themſelves, but to fill up the houſe by new elections; and that at this very time it was engaged in deliberations with regard to this expedient. Cromwell in a rage, haſtened to the houſe, taking with him a body of 300 ſoldiers, whom he arranged about the houſe. After waiting for ſome time in ſeeming ſuſpence, and profeſſing his reluctance in adopting the meaſure which he had previouſly determined to execute, that of diſſolving the parliament, he carried it into effect in the moſt rude and violent manner; and, without the leaſt oppoſition or murmur, though he loaded the parliament with the vileſt reproaches, for their tyranny, ambition, oppreſſion, and robbery of the public, he annihilated that famous aſſembly, which had filled all Europe with the renown of its actions, and with aſtoniſhment at its crimes, and the commencement of which was not more ardently deſired by the people than its final diſſolution. Parliament having been thus diſſolved, Cromwell might have aſſumed the adminiſtration of the government by an authority ſimilar to that with which he had diſmiſſed the parliament. But he choſe to proceed in his aſſumption of the ſovereign power by more cautious ſteps, and with ſome appearance of reſpect for the popular opinion. Accordingly, by the advice of his council of officers, he ſent ſummonſes to 128 perſons of different towns and counties of England, to five of Scotland, and ſix of Ireland; and he pretended by his ſole act and deed to devolve upon theſe the whole authority of the ſtate. This legiſlative power they were to exerciſe during 15 months; and they were afterwards to chooſe the ſame number of perſons, who might ſucceed them in that high and important office. They immediately voted themſelves a parliament, called by way of deriſion from Barebone, a leather-ſeller, one of their number, "Barebone's parliament;" and having their own conſent, as well as that of Oliver Cromwell, for their legiſlative authority, they now proceeded very gravely to the exerciſe of it. The members of this legiſlative aſſembly, of which Cromwell himſelf was aſhamed, though he had introduced into it ſeveral members entirely devoted to his own intereſt, found themſelves unequal to the burden impoſed upon them; and having met, by conſent, at an early hour, they agreed to diſſolve themſelves and to reſign the ſovereign authority into the hands from which they had received it. They haſtened, therefore, to Cromwell, along with Rouſe, their ſpeaker; and by a formal deed of aſſignment reſtored to him the ſupreme authority. The council of officers now propoſed to adopt another ſcheme of government, and to temper the liberty of a commonwealth by the authority of a ſingle perſon, who ſhould be known by the appellation of protector. Without delay, Lambert, who made this propoſition, prepared what was called "the inſtrument of government," containing the plan of this new legiſlature; and as it was ſuppoſed to be agreeable to the general, it was immediately voted by the council of officers. Cromwell was declared "Protector," and with great ſolemnity inſtalled in that high office. The chief articles of the forementioned inſtrument are theſe: a council was appointed, the number of which was not to exceed 21, nor to be leſs than 13 perſons. Theſe were to enjoy their office during life or good behaviour; and in caſe of a vacancy, the remaining members named three, of whom the protector choſe one. The protector was appointed ſupreme magiſtrate of the commonwealth; in his name all juſtice was to be adminiſtered; from him were all magiſtracy and honours derived; he had the power of pardoning all crimes, excepting murder and treaſon; to him the benefit of all forfeitures devolved. The right of peace, war, and alliance reſted in him, with the advice and aſſiſtance of his council. The power of the ſword was veſted in the protector jointly with the parliament, while it was ſitting, or with the council of ſtate in the intervals. He was obliged to ſummon a parliament every three years, and allow them to ſit five months without adjournment, prorogation, or diſſolution. The bills which they paſſed, were to be preſented to the protector for his aſſent; but if it were not obtained within twenty days, they were to become laws by the ſole authority of parliament. A ſtanding army for Great Britain and Ireland was eſtabliſhed, of 20,000 foot and 10,000 horſe; and funds were aſſigned for their ſupport. Theſe were not to be diminiſhed without the conſent of the protector; and in this article alone he aſſumed a negative. During the intervals of parliament, the protector and council had the power of enacting laws, which were to be valid till the next meeting of parliament. The chancellor, treaſurer, admiral, chief governors of Ireland and Scotland, and the chief juſtices of both the benches, muſt be choſen with the approbation of parliament; and in the intervals, with the approbation of the council, to be afterwards ratified by parliament. The protector was to enjoy his office during life; and on his death, the place was to be immediately ſupplied by the council. Such was the inſtrument of government enacted by the council of officers, and ſolemnly ſworn to by Oliver Cromwell. The council of ſtate, named by the inſtrument, conſiſted of 15 perſons; men entirely devoted to the protector, and by reaſon of the oppoſition among themſelves in party and principles, not likely ever to combine againſt him. The military force of the country was exerted under this government with vigour, conduct, and unanimity; and never did the kingdom appear more formidable to all foreign nations. In September, 1654, a new parliament was ſummoned. Of 400 members, which repreſented England, 270 were choſen by the counties; the reſt were elected by London, and the more conſiderable corporations; all the ſmall boroughs having been deprived of their right of election, becauſe they were the moſt expoſed to influence and corruption. The lower populace, ſo eaſily guided or deceived, were alſo excluded from the elections; an eſtate of 200*l.* value was neceſſary to entitle any one to a vote. The elections of this parliament, ſays Mr. Hume, were conducted with perfect freedom; and excepting, that part of the royaliſts which had borne arms againſt the parliament and all their ſons were excluded, a more fair repreſentation of the people could not be deſired or expected. Thirty members were returned from Scotland, and as many from Ireland. This parliament, having heard the protector's ſpeech of three hours length, and having choſen Lenthal for their ſpeaker, immediately entered into a diſcuſſion of the inſtrument of government, and of that authority, which Cromwell, by the title of protector, had aſſumed over the nation. The greateſt liberty was uſed in arraigning this new dignity; and even the perſonal character and conduct of Cromwell eſcaped not without cenſure. The protector, ſurpriſed and enraged at the refractory ſpirit of the parliament, ſent for them to the painted chamber, and authoritatively inveighed againſt their conduct. He obliged the members to ſign a recognition of his authority, and an engagement not to propoſe or conſent to any alteration in the government, as it was ſettled in a ſingle perſon and a parliament; and he placed guards at the door of the houſe, who allowed none but ſubſcribers to enter. Moſt of the members, after ſome heſitation, ſubmitted to this condition; but retained the ſame refractory ſpirit which they had manifeſted in their firſt debate. Cromwell haſtened to the diſſolution of this dangerous aſſembly, and having ordered their attendance, he delivered to them a tedious, confuſed, angry harangue, and diſmiſſed them.

In 1656, Cromwell, having gained to his adminiſtration ſo much luſtre and ſucceſs abroad, and [illegible] ſuch order and tranquillity at home, ventured to ſummon a parliament; having taken previous meaſures for filling the houſe with his own creatures and partiſans. He found, however, that the majority would not be favourable to him. He, therefore, ſet guards on the door, who permitted none to enter but ſuch as produced a warrant from his council: and the council rejected about a hundred, who either refuſed a recognition of the protector's government, or were on other accounts obnoxious to him. Theſe proteſted againſt a violence which was ſubverſive of all liberty; but every application for redreſs was neglected both by the council and parliament. In this parliament a motion was made to beſtow the crown on Cromwell; and no ſurpriſe or reluctance was diſcovered on the occaſion. A formal motion was afterwards made to the ſame purpoſe; but it produced great diſorder, and divided the houſe into parties. The bill was however voted by a conſiderable majority; and a committee was appointed to reaſon with the protector, and to overcome thoſe ſcruples which he pretended againſt accepting ſo liberal an offer. Cromwell's chief difficulty aroſe from the oppoſition of the ſoldiers; and he juſtly dreaded a mutiny in the army. At length he determined to decline the acceptance of that crown, which the repreſentatives of the nation, in the moſt ſolemn manner, had tendered to him. The parliament, when Cromwell had rejected the royal dignity, found themſelves obliged to retain the name of a commonwealth and protector; and as the government had hitherto been a manifeſt uſurpation, it was thought proper to ſanction it by a ſeeming choice of the people and their repreſentatives. Accordingly, inſtead of "the inſtrument of government," which was the work of the general officers alone, an "humble petition and advice" was framed, and offered to the protector by the parliament. This was repreſented as the great baſis of the republican eſtabliſhment, regulating and limiting the powers of each member of the conſtitution, and ſecuring the liberty of the people to the moſt remote poſterity. By this deed, the authority of protector was in ſome particulars enlarged; in others, it was conſiderably diminiſhed. He had the power of nominating his ſucceſſor; he had a perpetual revenue aſſigned him, of a million a year for the pay of the fleet and army, and 300,000*l.* for the ſupport of civil government; and he had authority to name another houſe, the members of which ſhould enjoy their ſeats during life, and exerciſe ſome functions of the former houſe of peers. But he abandoned the power aſſumed in the intervals of parliament, of framing laws with the conſent of his council; and he agreed, that no members of either houſe ſhould be excluded but by conſent of that houſe, of which they were members. The other articles were much the ſame with thoſe contained in the inſtrument of government. This model of government, the humble petition and advice, was accepted for the voluntary deed of the whole people in the three united nations; and Cromwell, as if his power had juſt commenced from this popular conſent, was anew inaugurated in Weſtminſter Hall, after the moſt ſolemn and pompous manner.

In 1658 the parliament was again aſſembled; conſiſting, as in the times of monarchy, of two houſes, the commons and the other houſe: Cromwell, during the interval having ſent writs to his houſe of peers, which conſiſted of 60 members. Upon the death of Cromwell in 1658 (ſee CROMWELL) the council recognized the ſucceſſion of his ſon Richard. A parliament was called; and in hopes of obtaining greater influence in elections, the ancient right was reſtored to all the ſmall boroughs; and the counties were allowed no more than their uſual members. The houſe of peers, or the other houſe, conſiſted of the ſame perſons that had been appointed by Oliver. All the commons, at firſt, ſigned an engagement, without heſitation, not to alter the preſent government; they next proceeded to examine "the humble petition and advice," and after much debate it was confirmed. But though parliament acquieſced, cabals were formed againſt the new protector by the army. Richard, who poſſeſſed neither penetration nor reſolution, was prevailed on to give an unguarded conſent for calling a general council of officers; but as ſoon as they were aſſembled, they voted a remonſtrance; and they propoſed that the whole military power ſhould be entruſted to ſome perſon, in whom they might all confide. The protector, who was in his diſpoſition gentle, humane, and generous, was juſtly alarmed at the movements of the officers; nor was the parliament leſs alarmed at the military cabals. They voted that there ſhould be no meeting or general council of officers, except with the protector's conſent, or by his orders. This enraged the officers, who haſtened to Richard, and demanded of him a diſſolution of the parliament. The parliament was diſſolved; and by the ſame act, the protector was, by every one, conſidered as dethroned. Soon after he ſigned his dimiſſion in form: and withdrawing into retirement, extended his peaceful life to an extreme old age. The council of officers, now poſſeſſed of ſupreme authority, deliberated what form of government they ſhould eſtabliſh. It was agreed at laſt to revive the long parliament, which had been expelled by Cromwell. The members of this parliament did not exceed 70; but they reſolved, ſince they enjoyed the title of the ſupreme authority, and obſerved that ſome appearance of a parliament was requiſite for the purpoſes of the army; not to act a ſubordinate part to thoſe who acknowledged themſelves as their ſervants. They choſe a council conſiſting of 7 perſons, who ſhould nominate to ſuch commands as became vacant; and they voted, that all commiſſions ſhould be received from the ſpeaker, and be aſſigned by him in the name of the houſe. The general officers were diſguſted by thoſe precautions; but the ſtate of the country prevented their manifeſting their diſguſt. As ſoon as an interval occurred, they renewed their hoſtility, and expelled the parliament. The officers, again poſſeſſed of ſupreme authority, elected a committee of 23 perſons, of whom 7 were officers, whom they pretended to inveſt with ſovereign authority; and they called them "the committee of ſafety." On the approach of danger, Lenthal the ſpeaker was invited by the officers to ſummon the parliament, which had twice before been expelled, with ſo much reproach and ignominy. But general Monk was advancing with his army, and having ſent a meſſage to the parliament from St. Alban's, deſiring them to remove from London thoſe regiments, which had ſo lately offered violence to their aſſembly; he marched towards London and took quarters at Weſtminſter. He afterwards required parliament, in the name of the citizens, ſoldiers, and whole commonwealth, to iſſue writs for the filling of their houſe, and to fix the time for their own diſſolution, and the aſſembling of a new parliament. The parliament attempted to conciliate the general, and diſpatched a committee to him for this purpoſe; but he refuſed to hear them, except in the preſence of ſome of the ſecluded members. Theſe members, upon the general's invitation, were reſtored; and the long parliament, after having paſſed ſome reſolutions for the compoſure of the kingdom, diſſolved itſelf, and iſſued writs for the immediate aſſembling of a new parliament. When the parliament met, meaſures were taken for the reſtoration of Charles II,; he was proclaimed in the preſence of the two houſes, on the 8th of May, and on the 29th, which was his birth-day, the king entered London. Rapin's Hiſt. vol. xi. Hume's Hiſt. vol. vii.

COMMORANCY, in *Law*, an abiding or dwelling in any place; as an inhabitant of an houſe in a vill, &c. Commorancy for a certain time may make a ſettlement in a pariſh. Commorancy conſiſts in uſually lying in a certain place. Dalt. Blackſt. Com. iv. 273.

COMMORTH, from the Brit. *Cymmorth*, q. d. ſubſidium, a contribution which was gathered at marriages, and when young prieſts ſaid or ſung the firſt maſſes, &c. See ſtat. 4 Hen. IV. c. 27. But ſtat. 26. Hen. VIII. c. 6, prohibits levying any ſuch in Wales, or the marches, &c. Cowel.

COMMOTAU, or Chomston, in *Geography*, a town of Bohemia, in the circle of Saatz. Large quantities of alum are prepared here. It is diſtant 10 miles N. W. of Saatz, 38 S. of Dreſden, and 42 N. W. of Prague.

COMMOTE, an ancient term in Wales, denoting half a cantred, or hundred; containing fifty villages. Stat. Walliæ, 12 Ed. I.

Wales was anciently divided into three provinces; each of theſe ſubdivided into cantreds; and every cantred into two *commotes*, or half hundreds.

Silveſter Girald, however, tells us, in his Itinerary, that a *commote* is but a quarter of a hundred. Commote alſo ſignifies a great ſigniory or lordſhip, and may include one, or divers manors. Co. Litt. 5.

COMMOTION, an inteſtine motion, or luctation in the parts of any thing.

In medicine, the term is chiefly uſed for a blow, or ſhake of the brain. A convulſion is a commotion of the fine medullary fibres of the brain. A fall occaſions a commotion, whence frequently ariſes a counterſtroke on the oppoſite part; which occaſions ſometimes a contrafiſſure, and at other times a rupture of the veſſels, and an impoſthume, by ſhaking the whole maſs of the brain.

COMMUNAM, *Appropriare*. See Appropriare, &c.

COMMUNANCE, a name formerly given to the commoners, or tenants and inhabitants, who had the right of common or commoning in an open field, &c. Cowley.

COMMUNE, in the preſent *organization* of France, denotes the ſubdiviſion of a canton, including ſometimes a ſingle town, and ſometimes an union of ſeveral villages, poſſeſſing a mayor, and a communal municipality. All the conſiderable cities are divided into ſeveral communes.

Commune *Concilium Regni Angliæ*, denotes the common council of the king and people aſſembled in parliament.

Commune *Rectum*. See Rectum.

COMMUNEM *Legem*, *Writ of Entry ad*. See Legem.

COMMUNIA *Placita non tenenda in ſcaccario*, an ancient writ directed to the treaſurer and barons of the Exchequer, forbidding them to hold plea between "common perſons," (*i. e.* not debtors, to the king, who alone originally ſued and were ſued there) in that court, where neither of the parties belong to the ſame. Reg. Orig. 187. But little obedience would be now paid to ſuch a writ, if any officers were to dare to iſſue it; for the court of Exchequer ſeems, by preſcription, to have attained a concurrent juriſdiction in civil ſuits with the other courts in Weſtminſter-hall.

COMMUNIBUS *Locis*, a Latin term, in frequent uſe among philoſophical, &c. writers; implying ſome medium, or mean relation between ſeveral places.

Dr. Keil ſuppoſes the ocean to be one quarter of a mile deep, *communibus locis*, *q. d.* at a medium, or taking one place with another.

Communibus *Annis*, has the ſame import with regard to years, that *communibus locis* has with regard to places.

Mr. Derham obſerves, that the depth of rain, *communibus annis*, *i. e.* one year with another, were it to ſtagnate on the earth, would amount to, at Townly in Lancaſhire, 42½ inches; at Upminſter, in Eſſex, 19¼; at Zurich, 32¼; at Piſa, 43¼; and at Paris, to 19 inches.

COMMUNICANS *Arteria Cerebri*, in *Anatomy*, is a branch of the internal carotid artery, which joins with a branch of the profunda cerebri, to form the circle of Willis. See Arteries.

COMMUNICATING, in *Theology*, the act of receiving the ſacrament of the Eucharist.

Thoſe of the *reformed*, and of the Greek church *communicate* under both kinds; thoſe of the Romiſh only under one.

The oriental communicants receive the ſpecies of wine by a ſpoon; and anciently they ſucked it through a pipe, as has been obſerved by Beat. Rheanus on Tertullian.

COMMUNICATION, the act of imparting a thing to another, or making him a ſharer with us therein.

The uſe of ſpeech is for the communicating of our ideas and ſentiments to each other.

Communication is alſo uſed for the connection of one thing with another; or the paſſage from one place to another. Anciently, it was frequent to have ſubterraneous communications between one place and another.

Communication, *Bridge of*. See Bridge.

Communication, in *Military Language*. Communications are all ſorts of ways or paſſages, above or below ground, which lead from different parts of the works to mines, or from one work to another. Thoſe are beſt, which cannot be annoyed by the enemy, but are ſecure againſt his fire. A place cannot be long or obſtinately defended without good communications; whereas, on the other hand, if theſe be good, it may hold out, if well garriſoned, and ſufficiently furniſhed with every thing neceſſary for defenſive operations, for a length of time. When its ditches are filled with water, or a river runs through it, floating bridges, boats, &c. ſerve as communications.

Communications *in and with a Camp*. In every camp there ſhould be communications between the different parts; and each of the principal, or more neceſſary ones, ought to be wide enough for forty or fifty men to walk abreaſt. As to communications with a camp, ſee the article Camp.

Communications *in the Attack of a Place*. Beſiegers ought to, and generally do, take care to join their works with one or ſeveral communications. All thoſe which they conſtruct in the parallels, on the glacis, and on the counterſcarp, communicate one with another. And as it generally happens, that the beſiegers' quarters in their camp are ſeparated by rivers, great or ſmall, or by marſhes, it is not only neceſſary, but of the firſt importance, to make cauſeways acroſs the marſhes and bridges of communication, acroſs the rivers, either on wooden frames, or on batteaux. It is better, however, to make them on frames or piles, if poſſible, as they are generally ſafer and ſtronger when ſo conſtructed, eſpecially if the place be in a ſituation to open a large ſluice of water capable of breaking thoſe placed on batteaux, as actually happened at the ſiege of Valenciennes, which the beſiegers were obliged to raiſe with loſs. That place was beſieged in 1656 by the French, under the command of the marſhals de Turenne and de la Ferté Senneterre. But the Spaniards, commanded by Don Juan of Auſtria, and the prince of Condé, made them raiſe the ſiege. And their quarters being ſeparated by the breaking of their bridges of communication, one half of their army was entirely routed, and the marſhal de la Ferté was made priſoner. In like manner, when the French were beſieging Turin with 72,000 men, prince Eugene, obſerving that one of their quarters was ſeparated from the reſt by rivers, and that their bridges were bad and neglected, attacked them in that place with 24,000 only, defeated them, and raiſed the ſiege.

The bridges ſhould be made very ſtrong and ſecure; and on every communication of difficulty or importance, there ſhould be at the leaſt four, at the diſtance of forty or fifty fathoms from one another. The avenues to them ought to be rendered as eaſy and practicable as poſſible. Guards ſhould be placed near them for their ſecurity, and to prevent their receiving any injury. And they ſhould always be made within the line of circumvallation, for the ſafety of thoſe who paſs and repaſs.

COMMUNICATION *of idioms*, in *Theology*, the act of imparting the attributes of one of the natures in Jeſus Chriſt to the other.

The communication of idioms is founded on the ſuppoſed union of two natures in the perſon of Chriſt: by this communication of idioms it is, that ſome divines ſay, God ſuffered, died, &c. which is ſtrictly underſtood of the human nature; and ſignifies that God ſuffered in his humanity, that he died as to his human nature, &c.

The Lutherans carry the communication of idioms ſo far, as to ſay, that Jeſus Chriſt is not only in his divine nature, and by reaſon of his divine perſon, but alſo really and properly in his humanity, immortal, immenſe, &c.

COMMUNICATION *of motion*, that act of a moving body, whereby another body at reſt is put by it in motion, or a body already in motion is accelerated.

F. Malebranche looks on the *communication of motion* as ſomething metaphyſical; *i. e.* as not neceſſarily ariſing from any phyſical principles, or any properties of bodies, but flowing from the immediate agency of God: there being, according to him, no more connection, or dependence, between the motion or reſt of one body, and that of another, than between the form, colour, magnitude, &c. of one body, and thoſe of another. The motion of one body, therefore, on his principle, is not any phyſical cauſe of that of another. See CAUSE.

The communication of motion reſults from, and is an evidence of the impenetrability and inertia of matter as ſuch: unleſs we admit the hypotheſis of penetrable matter, advanced by M. Boſcovich and Mr. Michell, and aſcribe to the powers of repulſion thoſe effects which have been uſually aſcribed to its ſolidity and actual reſiſtance. See MATTER.

Action, and re-action, ſir Iſaac Newton demonſtrates, are equal and oppoſite; ſo that one body ſtriking againſt another, and thereby occaſioning a change in its motion, does itſelf undergo the very ſame change in its own motion, the contrary way. See MOTION.

Hence, a moving body ſtriking directly againſt another at reſt, the one loſes juſt as much of its motion as it communicates to the other; and they will proceed with the ſame velocity as if united into one maſs. For the laws and quantity of motion ſo communicated, either in elaſtic or non elaſtic bodies; ſee COLLISION.

COMMUNICATION, *communicatio*, in *Rhetoric*. See ANACOINOSIS.

COMMUNI CUSTODIA, in *Law*, a writ which anciently lay for the lord, whoſe tenant holding by knight's ſervice died, and left his eldeſt ſon under age, againſt a ſtranger that entered the land, and obtained the ward of the body. F. N. B. 89. Reg. Orig. 161. Since the ſtat. 12. Car. II. c. 24., hath taken away wardſhips, this writ is of no uſe.

COMMUNION, in *Theology*, an uniform belief in ſeveral perſons; whereby they are united under one head, in one CHURCH. See UNITY, UNIFORMITY, &c.

In this ſenſe, the Lutherans, Calviniſts, &c. are ſaid to have been cut off from the Romiſh *communion*.

This is the primitive uſe of the word *communion*, as appears from the canons of the council of Elvira.

Though the term has been more extenſively applied to denote a general agreement in matters of doctrine, diſcipline, and worſhip. And unleſs the term be underſtood in this large ſenſe, ſo various are the opinions of men, there could be no *communion* among the members of any one church on earth.

COMMUNION is alſo uſed for the act of *communicating* in, or participating of, the ſacrament of the EUCHARIST. The fourth council of Lateran decrees, that every believer ſhall receive the communion, at leaſt, at Eaſter; which ſeems to import a tacit deſire, that they ſhould do it oftener; as, in effect they did it much oftner in the primitive days. Gratian, and the maſter of the ſentences, preſcribe it as rule for the laity to communicate three times a year, at Eaſter, Whitſuntide, and Chriſtmas. But in the thirteenth century, the practice was got on foot, never to approach the euchariſt except at Eaſter; and the council thought fit to enjoin it then by a law, leſt their coldneſs and remiſſneſs ſhould go farther ſtill.

And the council of Trent renewed the ſame injunction, and recommended frequent communion without enforcing it by an expreſs decree.

In the ninth century, the communion was ſtill received by the laity in both kinds; or, rather the ſpecies of bread was dipped in the wine, as is owned by the Romaniſts themſelves. Acta SS. Benedict Sæc. III. M. de Marca obſerves, that they received it at firſt in their hands, Hiſt. de Bern, and believes the communion under one kind alone to have had its riſe in the Weſt under pope Urban II. in 1096, at the time of the conqueſt of the Holy Land. And it was more ſolemnly enjoined by the council of Conſtance in 1414. The twenty-eighth canon of the council of Clermont enjoins the communion to be received under both kinds, diſtinctly; adding, however, two exceptions; the one of neceſſity, the other of caution, *niſi per neceſſitatem, & cautelam;* the firſt in favour of the ſick, the ſecond of the abſtemious, or thoſe who had an averſion from wine.

It was formerly a kind of canonical puniſhment, for clerks guilty of any crime, to be reduced to *lay communion*, i. e. only to receive as the laity did, *viz.* under one kind.

They had another puniſhment of the ſame nature, though under a different name, called *foreign communion;* to which the canons frequently condemned their biſhops, and other clerks. This puniſhment was not any excommunication, or depoſition; but a kind of ſuſpenſion from the function of the order; and a degradation from the rank they held in the church. It had its name becauſe the communion was only granted to the criminal on the foot of a foreign clerk, *i. e.* being reduced to the loweſt of his order, he took place after all thoſe of his rank, as all clerks, &c. did in the churches to which they did not belong. The ſecond council of Agda orders every clerk that abſents himſelf from the church, to be reduced to foreign communion.

COMMUNION, *Infant.* Some inſtances occur in the early ages of the church, of the practice of adminiſtering the euchariſt to infants: and ſome few have imitated this practice in more modern times. Mr. Pierce pleads the uſe of it even to this day among the Greeks, and in the Bohemian churches till near the time of the Reformation; and he refers to the uſage of the ancient churches, recorded by Photius, Auguſtin, and Cyprian. He urges from Scripture the right which children have to all the privileges of which they are capable, as well as the Jewiſh children under the law, who were allowed to eat of the paſſover, and other ſacrifices. To which it has been anſwered, that the ſacrifices, of which they were allowed to partake, were chiefly peace offerings, which became the common food of the family, and were not conſidered as acts of devotion in ſuch a degree as our euchariſt. He replies to the objection founded on the incapacity of infants to examine themſelves and diſcern the Lord's body, by obſerving that the precept extends only to thoſe who were capable of underſtanding and complying with it; on the ſame ground that faith is required previous to baptiſm. Biſhop Bedell ſuggeſts the following inquiry relative to this ſubject; what neceſſity of baptiſing infants, if their baptiſm produces no effect till they come to years of diſcretion? To which he replies, though the moſt principal effect be not attained preſently, the leſs principal are not to be refuſed: ſo children were circumciſed, who could not underſtand the reaſon of it, and the ſame alſo did eat the paſſover: and ſo did children baptized, in the primitive church, communicate in the Lord's ſupper: which I know not (ſays he) why it ſhould not be ſo ſtill; *de quo alias*. It has been alleged, that the foundation of this practice was a miſtaken apprehenſion of the abſolute neceſſity of this ordinance in order to ſalvation, reſulting from an erroneous interpretation of John vi. 53. See Biſhop Bedell's Letter to Dr. Ward, in p. 442 of Archbiſhop Uſher's Life by Parr. Pierce's Eſſay on the Euchariſt. Wall's Hiſt. of Infant Baptiſm, part ii. chap. 9. § 15 and 16. Waterland's Review of the Doctrine of the Euchariſt, and preface to his two volumes of Poſthumous Sermons, p. 32, &c. and Inquiry concerning Infant Communion, vol. ii. p. 75, &c.

COMMUNION *ſervice*, denotes that part of the liturgy of the church of England which relates to the adminiſtration of the ſacrament. See LITURGY.

COMMUNION-*table*. See ALTAR.

COMMUNIS CAPSULÆ. See CAPSULA.

COMMUNIS *ductus choledochus*. See DUCTUS.

COMMUNIS *digitorum manus extenſor*. See EXTENSOR.

COMMUNIS *labiorum depreſſor*. See DEPRESSOR.

COMMUNIS *labiorum elevator*. See ELEVATOR.

COMMUNIS *miſericordia*. See MISERICORDIA.

COMMUNITY, a ſociety or body of men united together under certain common laws, agreed on among themſelves, or impoſed by a ſuperior.

The Romans, who ſeem to have given the firſt hint of communities to the ſeveral nations into which their empire was divided, doubtleſs borrowed it from ſome rules of their neighbours: they call them *colleges;* which term, among them, had nearly the ſame ſignification with community among us. For an account of the introduction and eſtabliſhment of communities in Europe, ſee *Charters of* COMMUNITY and CITY. See alſo CORPORATION and CROISADE.

Communities now are of two kinds, *eccleſiaſtic* and *laic;* the firſt are either *ſecular*, as chapters of cathedral and collegiate churches; or *regular*, as convents, monaſteries, &c.

Lay communities are of various kinds; ſome contracted by a fixed abode of a year and a day in the ſame place; others formed by the diſcharge of the ſame office, the profeſſion of the ſame art, or attending the ſame place of worſhip, as thoſe of pariſhes, fraternities, &c.

Accordingly, the word is commonly underſtood of pious foundations for the ſupport of ſeveral perſons, either in a ſecular or regular life; as *colleges*, *abbies*, *convents*, *priories*, *ſeminaries*, *hoſpitals*, *inns*, &c.

Community is more particularly uſed in the French law, for the joint property in goods between the huſband and the wife: the reſult of which is, that during marriage they are equally intitled to all effects, and liable to all debts, contracted either before or under marriage.

Community is a ſpecies of ſucceſſion, and the acceptance of community reſembles an *additio hereditatis*.

Community was ſet on foot in favour of the wives, to enter them as ſharers in their huſband's effects.

In countries where the civil law obtains, this community has no place, nor even in ſeveral cuſtomary countries, as being reputed a burden on the man.

Anciently, the woman's ſhare in the community was only one-third; and this appears ſtill the ſenſe of the law among us, the widow, at the deceaſe of her huſband, being only intitled to one-third part of the moveables.

COMMUNITY, *continued*, in the *French Law*, is that which ſubſiſts between the ſurvivor of two perſons joined in marriage, and the minor children of that marriage, when the ſurvivor has not made an inventory of the effects in poſſeſſion during marriage. The widow may either renounce community with her children, or continue it.

COMMUNITY, *tacit*, is a community contracted between a man and woman, by the mere mingling of their effects, provided they have lived together the ſpace of a year and a day: this community, being odious, is now aboliſhed.

COMMUNITY, *Charters of*. See CHARTERS *of Community*.

COMMUNITY *of Goods*, as it has been ſometimes denominated, ſignifies a practice which was adopted for a ſhort time in the primitive church, and which conſiſted principally in a common uſe, derived from an unbounded liberality, that induced the opulent to ſhare their riches with their indigent brethren. The rich ſupplied the wants of their neceſſitous brethren with ſuch liberality and promptitude, that, as St. Luke tells us (Acts ii. 4. iv. 32.) among the primitive diſciples of Chriſt, all things were *in common*. This expreſſion, however, has been greatly abuſed, ſays Moſheim (E. H. v. i. p. 60), and has been made to ſignify a "community of rights, goods, and poſſeſſions," than which interpretation nothing is more groundleſs, nothing more falſe. From a multitude of reaſons, as well as from the expreſs words of St. Peter (Acts v. iv.) it evidently appears, that the community which is implied in mutual uſe, and mutual liberality, is the only thing intended in this paſſage. This is very clearly and ſatisfactorily proved by Moſheim, in a diſſertation concerning the true nature of the community of goods, which is ſaid to have taken place in the church of Jeruſalem. This learned diſcourſe is to be found in the ſecond volume of his excellent work entitled, "Diſſertationes ad Hiſtoriam eccleſiaſticam pertinentes." Mr. Gibbon (ſee Hiſt. Decl. and Fall of Rom. Emp. vol. ii. p. 341) has given a very uncandid and unjuſt ſtatement of this ancient Chriſtian practice, and inſtead of conſidering it as honourable to the liberality and mutual benevolence of the firſt diſciples, he ſeems to attach reproach and cenſure to it; when he ſuggeſts that the community of women, and that of temporal goods, may be conſidered as inſeparable parts of the ſame ſyſtem. He alſo obſerves that it was of the ſame kind with that which had ſo agreeably amuſed the imagination of Plato, and which ſubſiſted in ſome degree among the auſtere ſect of the Eſſenians; although it was undoubtedly of a very different nature. This author further adds, that the progreſs of the Chriſtian religion relaxed, and gradually aboliſhed this generous inſtitution, which, in hands leſs pure than thoſe of the apoſtles, would too ſoon have been corrupted and abuſed by the returning ſelfiſhneſs of human nature; and the converts who embraced the new religion were permitted to retain the poſſeſſion of their patrimony, to receive legacies and inheritances, and to increaſe their ſeparate property by all the lawful means of trade and induſtry. Biſhop Watſon (ſee his "Apology for Chriſtianity,") has juſtly obſerved, that the expreſſion "permitted to retain," in ordinary acceptation, implies an antecedent obligation to part with; but, as he adds, we have no account in ſcripture of any ſuch obligation being impoſed upon the converts to Chriſtianity, either by Chriſt himſelf, or by his apoſtles, or by any other authority: nay, in the very place where this community of goods is treated of, there is an expreſs proof to the contrary. When Peter was about to inflict an exemplary puniſhment upon Ananias (not for keeping back a part of the price, as ſome men are fond of repreſenting it, but) for his lying and hypocriſy, in offering a part of the price of his land as the whole of it; he ſaid to him, "Whilſt it remained (unſold) was it not thine own? and after it was ſold, was it not in thine own power?" From this account it is evident, that Ananias was under no obligation to part with his patrimony; and after he had parted with it, the price was in his own power; the apoſtle would have "permitted him to retain" the whole of it, if he had thought fit; though he would not permit his prevarication to go unpuniſhed.

Pythagoras not only taught his diſciples to be contented with a little, but even deprived them of all command over their own property, by caſting the poſſeſſions of each individual into a common ſtock, to be diſtributed by proper officers, as occaſion ſhould require. From the time of this ſequeſtration of their goods, as long as they continued members of this ſociety, they lived upon the footing of perfect equality, and ſat down together daily at a common table. If any one, however, repented of the connection, he was at liberty to depart, and might reclaim, from the general fund, his whole contribution.

COMMUNITY *of the kingdom.* See **COMMONALTY**.

COMMUTATION, in *Aſtronomy*. *Angle of* **COMMUTATION**, is the diſtance between the ſun's true place ſeen from the earth, and the place of a planet reduced to the ecliptic. See **PLACE**.

Thus the angle ESR (*Plate* V. *Aſtronomy, fig.* 11.) ſubtended between the ſun's true place, E, viewed from the earth at S, and that of a planet reduced to the ecliptic, R, is the angle of commutation.

The angle of commutation, therefore, is found by ſubtracting the ſun's longitude from the heliocentric longitude of the planet R; or contrarily.

COMMUTATION, in *Law*, a change of a penalty, or puniſhment, *viz.* of a greater for a leſs, &c. as when death is commuted for, by baniſhment or perpetual impriſonment, &c. Suits are, and always were, allowable in the ſpiritual court, for money agreed to be given as a commutation for penance. Art. Cler. 9 Edw. II. c. 4. F. N. B. 53.

Some doubt whether the word be properly applied to any change but that of puniſhment: others will have it indifferently ſerve for the exchanging, or trucking of any thing.

COMMUTATION *Act*, an act paſſed during the ſeſſion of parliament in 1784, as part of a ſyſtem for the prevention of ſmuggling; ſo called becauſe, whilſt it gave up the exiſting duties and exciſe on teas, it propoſed an additional tax on windows, not as a new tax, but as a *commutation* for the portion of the duties on tea which it ſurrendered. The plan of the framers of this bill was to take off all the exciſe duty on tea, and impoſe a cuſtom duty of 12 *l.* 10 *s.* on Bohea tea, which, it was apprehended, would ruin the ſmuggling trade in that article. On the finer kinds of tea, a higher duty would be laid; 15 *l.* per cent. on ſouchong, &c.; 20 *l.* on ſinglo and hyſon; and 30 *l.* on congo. The total annual importation of teas into Europe amounted to about 19,000,000 *lbs.*, above two-thirds of which quantity were conſumed in Great Britain and Ireland, though the legal importation was not quite 6,000,000; conſequently the quantity annually ſmuggled muſt have been above 7,000,000 *lbs.* According to this calculation, the people of England were conſiderably under-rated at the number of 6,000,000. Of theſe it was ſaid that 2,000,000 would be relieved from the payment of the preſent duty on tea, without being obliged to contribute a farthing towards the tax which would be propoſed as a ſubſtitution; the other 4,000,000, it was calculated, would, one with another, conſume 3 *lbs.* of tea each in the year, for each pound of which, they, at this time, paid on an average 2 *s.* 7 *d.* duty; this duty, or the principal part of it being taken off, they could, of courſe, afford to pay a ſubſtituted tax, which was propoſed to be raiſed in the following manner:

On every houſe with ſeven windows, which houſe was alſo rated to the houſe tax, it was intended to lay an additional tax of 3 *s.* and ſo on, charging 8 *s.* for every houſe of eight windows; 9 *s.* for thoſe of nine windows; 10 *s.* 6 *d.* for thoſe of ten windows, and ſo on, adding 2 *s.* 6 *d.* for each window up to 24, and ſtill riſing up to 180 windows, for which 20 *l.* per annum ſhould be paid, over and above the duty at preſent paid on windows and houſes. This regulation was calculated to produce above 700,000 *l.*; ſo that with the new duty on tea, the produce would be near 900,000 *l.* It was ſuggeſted that, according to this plan, the public revenue would be a conſiderable gainer, and the people at the ſame time have no reaſon to complain of additional burdens. In England, Scotland, and Wales, it was calculated that there were about 699,058 houſes, which might be divided into the following claſſes; 286,293 houſes under ſeven windows; 211.483 houſes having from 8 to 10 windows; 38,324 of 11 windows; 24,919 from 12 to 13; 67,652, from 14 to 19; 52,652, of 20 windows and upwards; and 17,732 houſes in Scotland. Of theſe about 200,000 as being excuſed from the houſe-tax would pay nothing to this new tax, and the inhabitants being of the poorer ſort, would be wholly delivered from the duty on tea. This regulation, it was ſuppoſed, would check, or rather abſolutely ruin, the ſmuggling trade; beſides being productive of other benefits to the fair trader, and particularly to the Eaſt India Company. Againſt this bill, which, however, paſſed into a law, many objections have been urged. To the Eaſt India Company, it has been argued, this act enſured certain advantage; but thoſe which the public were to derive from it are leſs obvious and certain. It has been ſaid that thoſe houſholders who were to be charged with the new rate for windows were preciſely the perſons who ſhould have received the reciprocal benefit of the commutation: but that the reverſe of this is undoubtedly the caſe; they who do not pay the *new* window-tax, or indeed *any* window-tax at all, being the only perſons who ſhare among them any little advantages that have accrued from the agreement. The facts are theſe: Of the five different ſorts of teas conſumed by the public, there are *three* which are chiefly uſed by thoſe who pay the new window tax, *viz.* congo, ſouchong, and hyſon. The price of the two former of theſe (which are the moſt uſed of the three) has been ſo inconſiderably reduced, as to afford nothing like a pecuniary compenſation for the additional window-tax, and the price of the third ſort, hyſon, which is the deareſt and the leaſt uſed, though rather more reduced, is ſtill wholly diſproportionate to the promiſed commutation. The only two ſorts of tea, therefore, where the reduction of price is at all conſiderable, are bohea and ſinglo; and thoſe are in general conſumed by the lower orders of people only. From theſe facts it has been inferred, that they who pay the new tax conſume thoſe ſorts of tea, from which not *one-ſixth* of the propoſed ſaving ariſes; while they who do not pay any tax at all, or at moſt a ſmall portion of it, conſume thoſe ſpecies of tea upon which almoſt *the whole of the ſaving*, or at leaſt upwards of *five-ſixths* of it ariſes. The act has been deemed, by thoſe who ſtrenuouſly oppoſed it, unjuſt in its principle, and oppreſſive in its operation.

COMNENA, Anna, in *Biography*, daughter of the emperor Alexius Comnenus, flouriſhed about the year 1118, and wrote fifteen books upon the life and actions of her father, which ſhe called the "Alexiad." She has been accuſed of a too great partiality in favour of her hero, for which, conſidering her near relationſhip, ſhe may claim an indulgence. This work was publiſhed with a Latin tranſlation in 1661, and again in 1670; to this laſt edition are added notes hiſtorical and philological by the learned Du Freſne.

COMNENO, in *Geography*, a town of European Turkey, in the province of Albania; 36 miles S.E. of Albaſano.

COMO, Da, Fra. Emanuello, in *Biography*, ſo called from the place of his nativity, a conſiderable town in the ſtate of Milan, was an hiſtorical painter, whoſe taſte for the art was firſt called forth upon his ſeeing ſome painters at work in the cathedral of Como. Without the direction of any maſter, he afterwards attained ſome degree of eminence. His works, however, are of very unequal merit; he painted in the refectory of a convent at Como a "Laſt Supper," by which but an indifferent idea of his talents could be formed, were not his character retrieved by an excellent picture in the church repreſenting a Pieta with Sainto. He died aged 76, in the year 1701. Orlandi. Lanzi, Storia Pittorica.

Como, in *Geography*, a ſtrong, populous, and commercial town of Italy, and capital of a diſtrict in the Milaneſe, built by the Gauls, under the conduct of Brennus, ſituated at the ſouth end of a lake to which it gives name, in a plain, almoſt ſurrounded with mountains. The town is encompaſſed by a wall, guarded with pictureſque towers, and backed by a conical eminence, on which ſtand the ruins of an ancient wall. The houſes are almoſt wholly built of ſtone; and the cathedral is a handſome edifice of white marble, hewn from the neighbouring quarries. The inhabitants have eſtabliſhed ſeveral manufactures of cotton and ſilk, and carry on ſome trade with the Griſons. This town being diſtinguiſhed as the birth-place of Pliny the younger, his ſtatue is placed in a niche on the outſide of the church, and has a Latin inſcription bearing the date of 1499. It is diſtant 20 miles N. of Milan, in N. lat. 45° 44′. E. long. 8° 57′.

Como, *Lake of*, a lake of Italy in the Milaneſe, on the confines of Swiſſerland, about 32 miles long and 88 in circumference. At firſt it is ſcarcely a quarter of a mile broad, but it widens near a neck of land upon which is ſituated the ſmall village of Turnio. Towards the ſouth it is divided into two branches, at the end of one of which ſtands Como, and at the end of the other Lecco. The river Adda paſſes through it, and ſeveral country houſes and villages are ſituated on its banks, which are adorned with vines, cheſnuts, and almond-trees. The neighbourhood of Turnio, and the diſtricts bordering the lake of Como, ſupply, for the moſt part, thoſe Italian emigrants, who wander through Europe vending barometers and thermometers, of whom numbers annually reſort to England.

COMOCLADIA, in *Botany* (from Κομοω, *comatus ſum;* and Κλαδος, *ramus;* ſo called becauſe the branches have a tuft of leaves at the end, bearing a fancied reſemblance to a head of hair.) Linn. Gen. 49. Schreb. 66. Lam. Ill. 65. Willd. 82 Juſſ. 370. Vent. 3. 444. Claſs and order, *triandria monogynia.* Nat. Ord. *Terebintaceæ;* Juſſ. Vent.

Gen. Ch. *Calyx* one-leafed, three or four cleft, ſpreading, coloured; ſegments roundiſh. *Cor.* Petals three or four, roundiſh-egg-ſhaped, acute, flat, widely ſpreading, a little larger than the calyx. *Stam.* Filaments three or four, awl-ſhaped, ſhorter than the corolla; anthers roundiſh, incumbent. *Piſt.* Germ ſuperior, egg-ſhaped; ſtyle none; ſtigma obtuſe, ſimple. *Peric.* Drupe oblong, ſomewhat curved, marked at the top with three dots; nut membranous, the form of the drupe. *Seed* ſingle.

Eſſ. Ch. Calyx three, rarely four-cleft. Petals three or four. Drupe oblong; with one ſeed.

Sp. 1. C. *integrifolia.* Linn. Sp. Pl. 1. Mart. 1. Lam. 1. Ill. 423. Willd. 1. Jacq. Amer. 12. Brown. Jam. 124. Lam. Ill. tab. 27. fig. 1. (Prunus racemoſa; Sloan. Jam. 2. 131. tab. 222. fig 1.) "Leaflets entire, ſmooth on both ſides." A tree, ſeldom more than twenty feet high. *Trunk* erect, of a moderate thickneſs; branches few, leafy at the end in open tufts. *Leaves* unequally winged, two feet long, leaflets not more than ſeventeen, four inches long, ovate-lanceolate, acuminate, ſlightly wrinkled by the tranſverſe veins, a little revolute at the edges. *Flowers* very numerous, ſmall, ſeſſile, without ſcent, of a deep red colour, in panicled racemes; racemes about twenty-four, a foot and a half long, branched, pendulous, always with a few quadrifid tetrandrous flowers intermixed with the others. A native of Jamaica, and St. Domingo. It abounds in a watery, ſlightly glutinous juice, which grows black when expoſed to the air, and ſtains the hands ſo as ſcarcely to be waſhed off. The wood is hard, of a fine grain, and reddiſh colour. 2. C *dentata.* Linn. Sp. Pl. 2. Mart. 2. Lam. 2. Ill. 425. Willd. 2. Jacq. Amer. 13. tab. 173. fig. 4. Pict. 12. tab. 259, fig. 2. "Leaflets egg-ſhaped, acute, toothed, ſomewhat prickly, veined and villous underneath." A tree much like the preceding. *Trunk* upright with few branches. *Leaves* a foot and half long, in tufts at the ends of the branches; leaflets from thirteen to twenty-one, oblong, acuminate, ſhining above, edged with prickly teeth. A native of Cuba. Its juice is milky, glutinous, turning very black in the air, durably ſtaining woollen and linen cloth, corroding the ſkin and rendering it ſcaly, ſmelling like liver of ſulphur, or the human excrement. The natives have an idea that to ſleep under it is dangerous. 3. C. *ilicifolia.* Swartz Prod. 17. Mart. 13. Lam. Ill. 424. Ill. tab. 27. fig. 2. (C. tricuſpidata; Nouv. Act. Acad. Paris, 1784, p. 347. Ilex dodonæa; Linn. Dodonæa; Plum. Gen. 20. tab. 118. fig. 1.) "Leaves roundiſh angular-ſpinous, ſmooth on both ſides." *Leaflets* ſeſſile, rigid, in crowded pairs terminated by an odd one. *Flowers* comparatively few; panicle very ſlender; racemes generally ſimple. A native of the Weſt Indies. La Marck's figure was taken from a dried ſpecimen. Willdenow has both an ilicifolia and an anguloſa, quoting for the latter La Marck's figure in oppoſition to La Marck himſelf. His error ſeems to have been occaſioned by miſtaking the ſynonym from Plumier, given by Linnæus, as a ſpineleſs variety of his ilex dodonæa, which Willdenow read D. aquifolii folio anguloſo *et* aculeato, inſtead of *non* aculeato, as it ſtands in the ſpecies plantarum.

Propagation and Culture.—The firſt two ſpecies have been propagated in England, by ſeeds obtained from their native climate. They require the ſame treatment as other tropical plants.

COMODI, Andrea, in *Biography*, an hiſtorical painter, who was born at Florence in 1560. He became at once the diſciple and companion of Ludovico Cigoli, and was ranked amongſt the beſt Florentine artiſts of his time, but the extreme difficulty which he found in ſatisfying himſelf with his own productions, has occaſioned their number to be very ſmall, conſidering the great age to which he lived. After having gone through the regular routine of academic ſtudy, he went to Rome, where he ſpent many years, and painted ſeveral freſcoes, particularly one in the tribuna of the church of St. Vitale, a compoſition of many figures, repreſenting Chriſt bearing his croſs, and on each ſide ſtories of martyrdoms. One of his moſt eſteemed eaſel pictures was a "Magdalen in the Deſert," for which the cardinal Barbarini preſented him with five hundred crowns, a very large price in thoſe times. His pictures of "Madonas" are very highly eſteemed for the beauty of their colouring and the delicacy with which they are finiſhed, and above all for an elegance and lightneſs of form, joined to an expreſſion of virgin modeſty peculiarly their own. His numerous copies of the pictures of Coreggio, and other great maſters are much eſteemed. He died in the year 1638. Baldinucci. Lanzi, Storia Pittorica.

COMOMBO, in *Geography*, or *the hill of Ombo*, anciently *Onebos*, a town of Egypt, ſituated to the ſouth of Thebes and on the ſame ſide of the river, where are ſtill ſeen conſiderable ruins of an ancient temple. The inhabitants of this place were famous for the worſhip of the crocodile, which they fed in their ponds (according to Ælian), where they became ſo tame, as to obey when they were called.

COMONAVA, a town of European Turkey, in the province of Macedonia; 60 miles N.N.E. of Akrida.

COMOPOLIS, in *Ancient Geography*, a town of Aſia, in Aſſyria, according to Ptolemy.—Alſo, a town of Aſia Minor, furnamed *Modrena*.—Alſo, a town of Aſia Minor, in Phrygia Salutaris, ſurnamed *Meros*; the ſame with *Myré*.

COMORA Isles, in *Geography*, are African iſlands in the Indian ocean, between the north-end of the iſland of Madagaſcar and the coaſt of Zanguebar, generally reckoned five in number, Johanna, Mayotta, Mohilla, Angazi, Comora, though ſome enumerate three, others four, and others eight, between the 41ſt and 46th degree of E. long. and the 10th and 14th of S. lat., at an equal diſtance from Madagaſcar and the continent of Africa. The largeſt is Johanna, which ſee. As the Comora iſles abound in horned cattle, ſheep, hogs, a variety of fruits and rice, they ſerve to refreſh the European ſhipping to and from India. The inhabitants are negroes of the Mahommedan religion; but they entertain the European ſeamen with great humanity.

Comora, one of the fore-mentioned iſlands, which gives name to the whole cluſter, about 6 leagues long, and three wide, but little known. S. lat. 11° 50′. E. long. 43°.

COMORIN, Cape, the ſouthernmoſt part of the ſouthern Hindooſtan, N.W. of the iſland of Ceylon. Though not above nine miles in extent, this promontory unites the two oppoſite ſeaſons of the year, owing to a ridge of mountains called the *Ghauts*, on the ſouth ſide of which trees are ſeen loaded with bloſſom and fruit, whilſt on the north ſide, the ſame ſort of trees are ſtripped of all their leaves. N. lat. 8°. E. long. 77° 32′ 30″.

COMORN, Comorra, Lat. a town of Hungary, and capital of a diſtrict, to which it gives name. It is ſo well defended by a fortreſs that the Turks could never take it. Its chief inhabitants were Hungarians, or Raſcians, who belong to the Greek church. In 1783 it was almoſt wholly deſtroyed by an earthquake: 36 miles S.E. of Preſburg, and 34 S.E. of Vienna.

COMORTH. See Commorth.

COMOSÆ, in *Botany*, the thirty-ſixth natural order in the Philoſophia Botanica of Linnæus, which he afterwards aboliſhed. It contained only ſpiræa, filipendula, and aruncus. Theſe are now all united in ſpiræa, and the genus referred to the order pomaceæ.

COMOSANDALOS, in *Antiquity*, a crown of flowers worn in the feſtival Chthonia.

COMOUCKS, in *Geography*, the Tartar inhabitants of Comania or Dagheſtan in Aſia, under the protection of Perſia. They are ferocious robbers. Every town has a chief named *Myrſa*; and the head of thoſe chiefs choſen from among themſelves is called *Schmkal*.

COMPACH, a river of Carinthia, which runs into the Moll, near Vellach.

COMPACT, in *Phyſics*, is a relative term, denoting a body to be cloſe, denſe, and heavy; having few pores, and thoſe ſmall ones. The heavieſt metals, as gold and ſilver, are the moſt *compact*. See Gravity.

Compact, in a *Legal Senſe*, ſignifies an agreement, or a contract, ſtipulated between ſeveral parties. A compact carries with it an obligation equal in point of conſcience to that of a law; but the original of the obligation is different. In compacts, we ourſelves determine and promiſe what ſhall be done, before we are obliged to do it; whereas in laws, we are obliged to act without ourſelves determining or promiſing at all. See Contract.

Compact is alſo the name of a celebrated bull, confirmed by pope Paul IV. relating to the cardinals.

In virtue of the bull of *compacts*, cardinals can only confer benefices in their natural ſtate; i.e. regular benefices on regulars.

COMPAGES *circularis montium*, a term deviſed by Kircher to expreſs what he in other places calls the annularity, or annular diſpoſition of Mountains, which he ſays run in continued chains, forming belts or ridges in the manner of ſpines, all round the globe of the earth, from north to ſouth, and ſo on from that point to north again, and in the ſame manner from eaſt to weſt, and from weſt to eaſt again.

COMPAGNE, Fr. The cabin of the commander or chief of a galley.

COMPAGNIES *aux Gardes*. Theſe were the companies of infantry that compoſed the regiment of French guards, making part of the houſehold troops of the king for the exterior guard. And it was uſual to ſay *Capitaine aux Gardes*, *Lieutenant aux Gardes*, &c.

Compagnie *Ecoſſoiſe*. See Gendarmerie or *Gardes du Corps*.

Compagnies *d'Ordonnance*. Theſe were companies that never formed corps or regiments, like the *gendarmes*, the light horſe, the muſketeers, &c.

Compagnies *des Gardes*. The four companies of horſe-guards made part of the troops of the houſehold of the kings of France for the interior guard. Thus, in ſpeaking of that corps, it was uſual to ſay, a captain of the guards, a lieutenant of the guards, &c. It was cuſtomary to ſpeak in the ſame manner of Swiſs guards.

Compagnies *Franches*, Fr. Theſe free companies were not regimented, but in time of war were put on a certain eſtabliſhment. Each of them had a chief, who commanded it. They were generally compoſed of dragoons, huſſars, and foot ſoldiers. All thoſe who ſerved in theſe corps or companies were called *partiſans*. They were employed in making incurſions into the enemy's country, and laying it waſte as much as they could. An officer, who had ſerved ſome campaigns as a partiſan, could not eaſily afterwards ſerve with regular troops. They are a ſort of voluntary pirates, who know no kind of ſubordination but that which is peculiar to themſelves. When theſe troops have chiefs that are hardy, brave, and intelligent, they render important ſervices to armies.

Compagnie *du Guet a pied.* See the article Maréchauſſée.

Compagnie *du Lieutenant criminel de Robecourte.* See alſo the article Maréchauſſée.

Compagnie *d'Ordonnance a cheval.* See the ſame article.

Independent company is one that is not incorporated into a regiment. Two ſuch companies generally belong to each regiment in England, for the purpoſe of ſupplying the regiments with recruits.

COMPAGUS, in *Antiquity,* a kind of ſummer-ſhoe worn by the Roman ſenators, conſiſting only of a ſole at the bottom; it was faſtened with leathern ſtraps, croſſing one another many times about the leg.

Rubenius makes the *compagi* to have been a ſort of caligæ worn by the roman generals as well as ſenators. Under the later emperors, in the middle age, we read of the ſame worn by popes, biſhops, and abbots.

COMPANION *of the Garter,* an appellation diſtinguiſhing one of the knights of that moſt noble order, at the head of which is the king, as ſovereign. Stat. 24 Hen. VIII. c. 13. See Garter.

COMPANY, a collective term, underſtood of ſeveral perſons aſſembled together in the ſame place, or with the ſame deſign. See Society.

The word is formed of the French *compagnie,* and that of *companio* or *companies,* which, Chifflet obſerves, are found in the Salic law, tit. 66. and are properly military words, underſtood of ſoldiers, who, according to the modern phraſe, are comrades, or meſs-mates, i. e. lodge together, eat together, &c. of the Latin *cum, with,* and *panis, bread.* It may be added, that in ſome Greek authors under the Weſtern empire, the word κυμπανια occurs in the ſenſe of *ſociety.*

Company, in *Commerce,* is an aſſociation of ſeveral merchants, or others, who unite in one common intereſt, and contribute by their ſtock, their counſel, and ſtudy, to the ſetting on foot, or ſupporting, of ſome lucrative eſtabliſhment.

Though *company* and ſociety, or fellowſhip, be in effect, the ſame thing, yet cuſtom has made a difference between them; ſociety, or partnerſhip, being underſtood of two, or three dealers, or not many more; and *company* uſually of a greater number. See Society.

A ſecond difference between *companies* and ſocieties is, that the firſt, eſpecially when they have excluſive privileges, cannot be eſtabliſhed without the conceſſion of the prince; and need letters patent, charters, &c. Whereas, for the latter, the conſent of the members, fixed and certified by acts and contracts, and authorized by bye-laws, is ſufficient.

The ſeveral profeſſions and trades exerciſed in the city of London, being incorporated into diſtinct fraternities, governed by their particular laws, a tabular view of them may not be unacceptable.

The abſtract of their incorporations, and particular privileges, is taken from the records of the Tower, &c. and from the Firma-Burgi of Madox, the king's hiſtoriographer; the account of their charities from thoſe eminent hiſtorians Stow and Strype; and the fines of the liverymen on admiſſion, are taken from the returns to the clerk of the parliament, and the ſcrutiny-books made after the ſeveral polls for the magiſtrates and repreſentatives of the city.

The companies are here placed according to their prececedence, beginning with the twelve principal ones, of one or other of which the lord mayors have generally made themſelves free at their election, if they were not ſo before; for they are not only the oldeſt, but the richeſt, many of them having had the honour of kings and princes to be their members, and the apartments of their halls being fit to entertain a monarch.

Companies.	Halls.	Incorporated by	A. D.	Livery fines			Charitable Gifts paid yearly, and Privileges, &c.	
				l.	*s.*	*d.*	*l.*	
1 Mercers	Cheapſide	Richard II.	1393	2	13	4	3000	Excluſive of 20 per cent. paid yearly to the widows of ſubſcribing clergymen during life, purſuant to a propoſal accepted in 1698, when they ſettled a fund of 14,000*l.* a year for that purpoſe.
2 Grocers	Poultry, Groc. alley	Edward III.	1345	20	0	0	700	
3 Drapers	Throgmorton ſtreet	Henry VI.	1439	25	0	0	4000	
4 Fiſhmongers	Thames-ſtreet	Henry VIII.	1536	13	6	8	800	
5 Goldſmiths	Foſter-lane	Richard II.	1393	20	0	0	1000	They had a privilege from Ed. IV. to inſpect, try, and regulate all gold and ſilver wares throughout the kingdom, and to puniſh all workers in either that was adulterated.
6 Skinners	Dowgate-hill	Edward III.	1327	15	0	0	700	
7 Merchant Taylors	Threadneedle-ſtreet	Edward IV.	1466	20	0	0	2000	They were once ſtyled taylors and linen armourers.
8 Haberdaſhers	Maiden-lane	Henry VI.	1447	25	0	0	3500	Were anciently ſtyled Milaners, becauſe they dealt in moſt that came from Milan.
9 Salters	Swithin's-lane	Q. Elizabeth	1558	20	0	0	500	
10 Ironmongers	Fenchurch-ſtreet	Edward IV.	1464	31	10	0	1800	In 1724, Mr Betton, a Turkey merchant, left 26,000*l.* in truſt; one moiety of the profits of it to be always applied to the ranſom of Britiſh captives from Mooriſh ſlavery; the other for the poor of the company, and to the charity-ſchools in its city and its liberty.
11 Vintners	Thames-ſtreet	Henry VI.	1437	31	13	4	600	
12 Clothworkers	Mincing-lane	Edward IV.	1482	31	10	0	1400	

	Companies	Halls.	Incorporated by	A. D.	Livery fines			Charitable Gifts, paid yearly, and Privileges, &c.
					l.	s.	d.	l.
13	Dyers	Elbow-lane	Edward IV.	1472	15	0	0	
14	Brewers	Addle ſtreet	Henry VI.	1438	6	13	4	
15	Leatherſellers *	Little St. Helens	Henry VI.	1442	20	0	0	* Hen. VII. made their wardens inſpectors of ſheep, lamb, and calves leather throughout the kingdom.
16	Pewterers ‡	Lime-ſtreet	Edward IV.	1474	20	0	0	‡ By act of Parl. 25 Hen. VIII. their wardens had the inſpection of pewter throughout England.
17	Barber-ſurgeons †	Monkwell-ſtreet	Edward IV.	1461	10	0	0	† In the reign of Hen. VIII. the ſurgeons of this company, then but 19, were exempted by parliament from ward and pariſh offices, and from military ſervice. They were incorporated ſeparately by 18 Geo. II. cap. 15. and the company of ſurgeons had an elegant hall in the Old Bailey, with a theatre for the diſſection of human bodies. They now form a royal college, and their houſe is in Lincoln's Inn fields.
18	Cutlers	Cloak-lane	Henry V.	1417	10	0	0	
19	Bakers	Harp-lane	Edward II.	1307	10	0	0	
20	Wax-chandlers	Maiden-lane	Richard III.	1483	5	0	0	
21	Tallow-chandlers	Dowgate-hill	Edward IV.	1463	15	0	0	
22	Armourers §	Coleman-ſtreet	Henry VI.	1423	15	0	0	§ The braſiers are united to this company.
23	Girdlers ‖	Baſinghall-ſtreet	Henry VI.	1449	5	0	0	‖ Q. Elizabeth incorporated the pinners and wire-drawers with them.
24	Butchers †	Pudding-lane	James I.	1615	11	11	0	† This is an ancient fraternity; of which we have an account in the reign of Henry II. A. D. 1180.
25	Sadlers	Cheapſide	Edward I.		10	0	0	
26	Carpenters	London-wall	Edward III.	1344	8	0	0	
27	Cordwainers	Diſtaff-lane	Henry IV.	1410	10	0	0	
28	Painter-ſtainers	Little Trinity-lane	Q. Elizabeth	1582	14	0	0	
29	Curriers	Near Cripplegate	James I.	1605	9	13	4	
30	Maſons	Baſinghall-ſtreet	Charles II.	1677	5	0	0	
31	Plumbers	Near Dowgate-hill	James I.	1611	10	0	0	
32	Innholders	Elbow-lane	Henry VIII.	1515	10	0	0	
33	Founders **	Lothbury	James I.	1614	8	0	0	** All braſs weights made in London, or three miles from it, muſt be ſized with the company's ſtandard, and have their mark; the averdupois to be ſealed at Guildhall, and the troy at goldſmith's hall. And the company are empowered by charter, to view and ſearch all braſs weights, and braſs and copper wares made within the ſaid diſtrict.
34	Poulters	No hall	Henry VII.	1504	10	0	0	
35	Cooks	Hall burnt	Edward IV.	1480	10	0	0	
36	Coopers	Baſinghall-ſtreet	Henry VII.	1501	15	0	0	
37	Tylers and bricklayers	Leadenhall-ſtreet	Q. Elizabeth	1568	12	0	0	
38	Bowyers	No hall	James I.	1620	8	0	0	
39	Fletchers ¶	St. Mary Axe	No charter		10	0	0	¶ It is only a company by preſcription.
40	Blackſmiths	Lambeth-hill	Q. Elizabeth	1577	8	0	0	
41	Joyners and cielers	Thames-ſtreet	Q. Elizabeth	1569	8	0	0	
42	Weavers	Baſinghall-ſtreet	Henry II.		6	0	0	
43	Woolmen	No hall	No charter					No livery; but they have a maſter, 2 wardens, and 11 aſſiſtants. They are only a company by preſcription, yet ſuppoſed to have commenced with the wool-trade.
44	Scriveners	No hall	James I.	1616	5	0	0	
45	Fruiterers	No hall	James I.	1605	5	0	0	
46	Plaiſterers	Addle ſtreet	Henry VII.	1501	8	0	0	
47	Stationers ††	Ludgate-ſtreet	Philip & Mary	1557	20	0	0	†† This company, which alſo includes bookſellers, letter-founders, printers, and book-binders, have a ſtock which is employed in printing almanacks, primers, pſalters, ſchool-books, &c. of which they have the ſole privilege, by virtue of a grant from the crown. This ſtock conſiſts of ſhares, which are diſtributed in different proportions among thoſe who have fined for, or ſerved the office of renter-wardens: whoſe ſhares, if they die married, devolve to their widows. They pay above 200l. a year in penſions and other charities. They are likewiſe truſtees for the diſpoſal of the conſiderable legacies of Mr. William Bowyer, a learned printer, (who died Nov. 18, 1778) conſiſting of 30 l. a year to the moſt learned journeyman that can be met with; and 180 l. a year in annuities of 20 l. each to nine neceſſitous printers of ſixty-three years of age or upwards; beſides other charities.
48	Broderers	Gutter-lane	Q. Elizabeth	1591	5	0	0	
49	Upholders	No hall	Charles I.	1627	4	10	0	
50	Muſicians	No hall	James I.	1604	10	0	0	

	Companies.	Halls.	Incorporated by	A. D.	Livery fines. *l. s. d.*	Charitable Gifts, paid yearly, and Privileges, &c.
51	Turners	College-hill	James I.	1604	8 0 0	
52	Baſket-makers	No hall	No charter		No livery; yet a company by preſcription, governed by 2 wardens and 48 aſſiſtants, with this motto to its arms, *Let us love one another.*	
53	Glaſiers ‖	No hall	Charles I.	1637	3 0 0	‖ The glaſs painters are incorporated with them.
54	Horners	No hall	Charles I.	1638	No livery; yet they have a maſter, 2 wardens, and 9 aſſiſtants, with a warehouſe in Spitalfields; where they divide in lots, among themſelves, ſuch horns as are bought up by their members in Leadenhall and other markets: And in 1465, they obtained an act of parliament that none ſhould be exported, but ſuch as they refuſed.	
55	Farriers	No hall	Charles II.	1673	5 0 0	
56	Paviours	No hall	No charter		No livery; yet it is a fellowſhip by preſcription, with 3 wardens, and 25 aſſiſtants.	
57	Loriners	London-wall	Q. Anne	1712	10 0 0	
58	Apothecaries	Blackfryars	James I.	1617	16 0 0	They are exempt from ward and pariſh-offices, and have a ſpacious phyſic-garden at Chelſea; which in 1721 was granted to the company for ever by Sir Hans Sloane, bart. the lord of the manor, on condition of their paying a quit-rent of 5 *l.* and continuing it always as a phyſic-garden, and of preſenting every year to the Royal Society fifty ſamples of different ſorts of plants, there grown, till they amount to two thouſand.—The latter of theſe conditions hath been long ſince more than completed. This is what may be called a trading company.
59	Shipwrights	No hall	James I.	1605	No livery; yet they have a maſter, 2 wardens, and 16 aſſiſtants.	
60	Spectacle-makers	No hall	Charles I.		No livery; yet have a maſter, 2 wardens, and 15 aſſiſtants.	
61	Clock-makers	No hall	Charles I.	1632	10 0 0	
62	Glovers	No hall	Charles I.	1638	5 17 4	
63	Comb-makers	No hall	Charles I.	1636	No livery; yet they have a maſter, 2 wardens, and 13 aſſiſtants.	
64	Felt-makers	No hall	James I.	1604	5 0 0	
65	Framework-knitters	Red croſs-ſtreet	Charles II.	1663	10 0 0	
66	Silk-throwers	No hall	Charles I.	1630	No livery; yet have a maſter, 2 wardens, and 20 aſſiſtants.	
67	Silkmen	No hall	Charles I.	1631	No livery; yet have a governor, and 20 aſſiſtants.	
68	Carmen, have no hall, nor charter, nor livery; but are a fellowſhip by act of common council, with the title of Free Carmen of the city of London, and have a maſter, 2 wardens, and 41 aſſiſtants, under the direction of the lord mayor and aldermen. The carts that belong to this fellowſhip, which are betwixt 4 and 500, are, by an act of common council, ſubjected to the rule of the preſident and governors of Chriſt's Hoſpital; to whom the owner of every cart pays 17 *s.* 4 *d.* a year for a licence to work it, and every cart is brought to the hoſpital to have a number in braſs put upon it.					
69	Pin-makers	No hall	Charles I.	1636	No livery; yet have a maſter, 2 wardens, and 18 aſſiſtants.	
70	Needle-makers	No hall	O. Cromwell	1656	5 5 0	
71	Gardeners	No hall	James I.	1616	No livery; yet have a maſter, 2 wardens, and 18 aſſiſtants.	
72	Soap makers	No hall	Charles I.	1630	No livery; yet have a maſter, 2 wardens, and 18 aſſiſtants.	
73	Tin-plate-workers	No hall	Charles II.	1670	10 0 0	
74	Wheelwrights	No hall	Charles II.	1670	15 15 0	
75	Diſtillers	No hall	Charles I.	1638	13 6 8	
76	Hatband-makers	No hall	Charles I.	1638	Incorporated with the company of needle-makers.	
77	Patten-makers	No hall	Charles II.	1670	6 0 0	
78	Glaſs-ſellers and looking-glaſs-makers	No hall	Charles II.	1664	5 0 0	
79	Tobacco-pipe-makers	No hall	Charles II	1663	No livery; yet have a maſter, 2 wardens, and 18 aſſiſtants.	
80	Coach and harneſs-makers	Noble-ſtreet	Charles II.	1677	10 0 0	
81	Gunſmiths	No hall	Charles I.	1638	10 0 0	
82	Gold and ſilver wire-drawers	No hall	James I.	1623	No livery; yet have a maſter, 2 wardens, and 18 aſſiſtants.	
83	Long-bow-ſtring-makers	No hall	No charter		No livery; yet a company by preſcription, and have 2 wardens, and 19 aſſiſtants.	

	Companies.	Halls.	Inorporated by	A. D.	Livery fines.	Charitable Gifts paid yearly, and Privileges, &c.
84	Card-makers	No hall	Charles I.	1629	No livery; yet have a maſter, 2 wardens, and 18 aſſiſtants.	
85	Fan-makers	No hall	Q. Anne	1709	No livery; yet have a maſter, 2 wardens, and 20 aſſiſtants.	

86 Woodmongers were a company incorporated with the carmen by K. James I. 1605, but ſurrendered their charter in 1668; by an act of common council in 1694, they obtained a privilege of keeping 120 carts, excluſive of the number kept by the carmen, *extinct*.

87	Starch-makers, *extinct*	No hall	James I.	1622	
88	Fiſhermen, *extinct*	No hall	James II.	1687	
89	Pariſh-clerks	Wood-ſtreet	Henry III.	1233	By a decree of the Star chamber court in 1625, they obtained a privilege to keep a preſs in their hall, for printing the weekly bills of mortality, by a perſon appointed by the archbiſhop of Canterbury. They are, by their charter, to make a report of all the weekly chriſtenings and burials in their ſeveral pariſhes every Tueſday, and they have a maſter, 2 wardens, and 17 aſſiſtants.

90 Porters, are another fellowſhip, without hall, or livery; conſiſting of tackle and ticket-porters. They were conſtituted a fraternity by act of common council in 1646, with a power of annually chuſing among themſelves twelve rulers, being ſix of each denomination. However, the court of lord mayor and aldermen have reſerved to themſelves a power of appointing one of their own body, as the chief judge in all controverſies. One very laudable cuſtom of the maſter tackle-porters is, that ſuch of their brethren as happen to be diſabled from working, receive their ſhare of all profits, as if actually in buſineſs, during life.

91 The watermen, wherrymen, and lightermen of this city and neighbouring places, were by act of K. William III. conſtituted a ſociety, or company, under the direction of the lord mayor and aldermen. They are to furniſh 1000 men for the navy, upon demand by the admiralty. They have a hall at Coal Harbour, near the Thames; and pay to their poor about 800 *l.* a year; chiefly raiſed by ferries over the Thames on Sunday.

N. B. The company of Surgeons, Pariſh-clerks, Porters and Watermen, have not the privilege of making their members freemen of the city of London.

From the foregoing liſt, it appears on the whole, that there are ninety-one companies, forty-eight halls, and that the number of liverymen, according to the moſt exact account that could be procured, in 1779, was 8954, but this number is variable. The ſums of money yearly diſtributed in charity by only twenty-three of the companies, amounts to more than 23,655 *l.*; and if but fortypounds each be annually given by the remaining ſixty-eight companies, the whole will much exceed 26,375*l.* per annum.

Company ſeems more peculiarly appropriated to thoſe grand aſſociations, ſet on foot for the commerce of the remote parts of the world; as the Engliſh and Dutch Eaſt India company, South Sea company, Miſſiſſippi company, &c.; the riſe and eſtabliſhment of which, we ſhall here ſet before the reader.

However injurious companies with joint-ſtock, and incorporated with excluſive privileges, may, at this time, be reckoned to the nation in general; it is yet certain that they were the general parent of all our foreign commerce: private traders being diſcouraged from hazarding their fortunes in foreign commerce, until the method of traffic had been firſt ſettled by joint-ſtock companies. From this principle it is, that we find ſeveral nations that are now endeavouring to improve their trade, and to eſtabliſh or increaſe marine power, by the means of joint-ſtock companies.

But ſince the trade of this kingdom, and the number of traders have increaſed, and the methods of aſſurance of ſhipping and merchandiſe, and the navigation to all parts of the known world have become familiar to us; theſe companies, in the opinions of moſt men, have been looked upon in the light of monopolies: their privileges have therefore been leſſened from time to time, in order to favour a free and general trade; and experience has ſhewn, that the trade of the nation has advanced, in proportion as monopolies have been diſcouraged. When companies do not trade upon a joint-ſtock, but are obliged to admit any perſon properly qualified, upon paying a certain fine, and agreeing to ſubmit to the regulations of the company, each member trading upon his own ſtock, and at his own riſk, they are called *regulated companies*. When they trade upon a joint-ſtock, each member ſharing in the common profit or loſs in proportion to his ſhare in this ſtock, they are called *joint-ſtock companies*. Such companies, whether regulated or joint-ſtock, ſometimes have, and ſometimes have not, excluſive privileges. Regulated companies reſemble, in every reſpect, the corporations of trades, ſo common in the cities and towns of all the different countries of Europe; and are a ſort of enlarged monopolies of the ſame kind. As no inhabitant of a town can exerciſe an incorporated trade, without firſt obtaining his freedom in the corporation; ſo in moſt caſes no ſubject of the ſtate can lawfully carry on any branch of foreign trade, for which a regulated company is eſtabliſhed, without firſt becoming a member of that company. Of companies of this kind we have had, or ſtill have, in Great Britain, the Hamburgh company, the Ruſſia company, the Eaſtland company, the Turkey company, and the African company. Regulated companies, as ſir Joſhua Child has obſerved, though they had frequently ſupported public miniſters, had never maintained any forts or garriſons in the countries to which they traded; whereas joint-ſtock companies frequently had. And in reality, ſays Dr. Smith, (Wealth of Nations, vol. iii. p. 116.) the former ſeem to be much more unfit for this ſort of ſervice than the latter; partly, becauſe the directors of a regulated company have no particular intereſt in the proſperity of the general trade of the country, for the ſake of which ſuch forts and garriſons are maintained; whereas the private intereſt of the directors of a joint-ſtock company, is connected with the proſperity of the general trade of the company, and with the maintenance of the forts and garriſons which are neceſſary for its defence; and partly, becauſe the directors of the latter company have always the management of a large capital, the joint-ſtock of the company, a part of which they may frequently employ, with propriety, in building, repairing, and maintaining ſuch neceſſary forts and garriſons; whilſt the directors of a regulated company, having the management of no common capital, have no other fund to employ in this way, but the caſual revenue ariſing from the admiſſion fines, and from the corporation duties impoſed upon the trade of the company.

Joint-ſtock companies, eſtabliſhed either by royal charter or by act of parliament, differ, in ſeveral reſpects, not only from regulated companies, but from private copartneries. 1ſt. In a private copartnery, no partner, without the conſent of the company, can transfer his ſhare to another perſon, or introduce a new member into the company. Each member, however, may, upon proper warning, withdraw from the copartnery, and demand payment of his ſhare of the common ſtock. In a joint-ſtock company, on the contrary, no member can demand payment of his ſhare from the company; but each member can, without their conſent, transfer his ſhare to another perſon, and thereby introduce a new member. 2dly. In a private copartnery, each partner is bound for the debts contracted by the company to the whole extent of his fortune; whereas, in a joint-ſtock company, each partner is bound only to the extent of his ſhare. The trade of a joint-ſtock company is always managed by a court of directors, which is frequently ſubject, in a variety of reſpects, to the controul of a general court of proprietors; but theſe proprietors, being for the moſt part totally exempted from trouble and from riſk, beyond a limited ſum, receive contentedly ſuch half-yearly or yearly dividends, as the directors think proper to aſſign; and many perſons are encouraged to become adventurers in joint-ſtock companies, who would, upon no account, hazard their fortunes in any private copartnery. The directors of ſuch companies being the managers rather of other people's money than of their own, it cannot well be expected, that they ſhould watch over it with the ſame anxious vigilance with which the partners in a private copartnery frequently watch over their own. Negligence and profuſion muſt always prevail, more or leſs, in the management of the affairs of ſuch a company. It is upon this account that joint-ſtock companies for foreign trade have ſeldom been able to maintain the competition againſt private adventurers. They have, accordingly, very ſeldom ſucceeded without an excluſive privilege, and frequently have not ſucceeded with one. Without an excluſive privilege, they have commonly miſmanaged the trade; with an excluſive privilege, they have both miſmanaged and confined it. For other appropriate and juſt obſervations on this ſubject, in its reference to the African company, the Hudſon's bay company, the South Sea company, and the Eaſt India company, ſee Smith's Wealth of Nations, vol. iii. chap. 1.

When a company of merchants undertake, at their own riſk and expence, to eſtabliſh a new trade with ſome remote and barbarous nation, it may not be unreaſonable to incorporate them into a joint-ſtock company, and to grant them, in caſe of their ſucceſs, a monopoly of the trade for a certain number of years. It is the ancient and moſt natural way in which the ſtate can recompenſe them for hazarding a dangerous and expenſive experiment, of which the public is afterwards to reap the benefit. A temporary monopoly of this kind may be vindicated upon the ſame principles upon which a like monopoly of a new machine is granted to its inventor, and that of a new book to its author. But upon the expiration of this term, the monopoly ought certainly to terminate; the forts and garriſons, if it was found neceſſary to eſtabliſh any, to be taken into the hands of government, their value to be paid to the company, and the trade to be laid open to all the ſubjects of the ſtate. Without a monopoly, however, a joint-ſtock company, as experience has ſhewn, cannot carry on any branch of foreign trade. An eminent French author, of great knowledge in matters of political economy, the abbé Morellet, gives a liſt of 55 joint-ſtock companies for foreign trade, which have been eſtabliſhed in different parts of Europe ſince the year 1600, and which, according to him, have all failed from miſmanagement, notwithſtanding they had excluſive privileges. Although he has been miſinformed with regard to the hiſtory of two or three of them, which were not joint-ſtock companies, and which have not failed; yet there have been ſeveral joint-ſtock companies, which have failed, and which he has omitted.

The only trades which it ſeems poſſible for a joint-ſtock company to carry on ſucceſsfully without an excluſive privilege, are thoſe, of which all the operations are capable of being reduced to what is called a routine, or to ſuch an uniformity of method as admits of little or no variation. Of this kind is, firſt, the banking trade; ſecondly, the trade of inſurance from fire, and from ſea-riſk and capture in time of war; thirdly, the trade of making and maintaining a navigable cut or canal; and fourthly, the ſimilar trade of bringing water for the ſupply of a great city. To render the eſtabliſhment of a joint-ſtock company perfectly reaſonable, with the circumſtance of being reducible to ſtrict rule and method, two other circumſtances ought to concur. Firſt, it ought to appear with the cleareſt evidence, that the undertaking is of greater and more general utility than the greater part of common trades; and, ſecondly, that it requires a greater capital than can eaſily be collected into a private copartnery. In the four trades above-mentioned both theſe circumſtances concur.

The joint-ſtock companies, ſays this judicious writer, which are eſtabliſhed for the public ſpirited purpoſe of promoting ſome particular manufacture, over and above managing their own affairs ill, to the diminution of the general ſtock of the ſociety, can, in other reſpects, ſcarce ever fail to do more harm than good. Notwithſtanding the moſt upright intentions, the unavoidable partiality of their directors to particular branches of the manufacture, of which the undertakers miſlead and impoſe upon them, is a real diſcouragement to the reſt, and neceſſarily breaks, more or leſs, that natural proportion which would otherwiſe eſtabliſh itſelf between judicious induſtry and profit, and which, to the general induſtry of the country, is of all encouragements, the greateſt and the moſt effectual.

Company, *African*; ſometimes called "Royal African Company," the name of the original inſtitution. The firſt commercial voyage from England to the coaſt of Guinea was in 1536, but nothing like a company was formed till the year 1588, when queen Elizabeth granted a patent for ten years to come, to ſome merchants of Exeter, and other perſons for an excluſive trade to the rivers Senegal and Gambia. In 1618, king James I. granted a charter for eſtabliſhing a joint-ſtock company; but ſeparate traders continuing to reſort to the coaſt, the company was ſoon diſſolved. Another company was erected by charter in 1631, which met with little ſucceſs; and in 1651, the parliament granted a charter for five years to the Eaſt India company, for trading to the Gold coaſt in their way to India. The demand for negroes in the Weſt India and American plantations increaſing conſiderably, another excluſive African or Guinea company was incorporated in 1662, at the head of which was the duke of York, joined with many perſons of rank and diſtinction. This company, like thoſe that had preceded it, was unſucceſsful, and its charter was ſoon after revoked by conſent of the parties aſſociated in the enterprize, in conſequence of which another excluſive company was incorporated by letters patent in 1672. They raiſed a capital of 111,000*l.* and improved the trade conſiderably; but at the revolution, the Weſt India planters joined the ſeparate traders in aſſerting that they were always beſt ſerved with ſlaves when the trade was free to all perſons; and excluſive companies, whoſe privileges had not been ſanctioned by parliament, being conſidered inconſiſtent with the declaration of rights, the trade became open again; but all private traders were to pay 10 per cent. to the company, towards maintaining the forts and factories on the coaſt. This contribution was however found inſufficient, and in 1730 parliament granted 10,000*l.* for the purpoſe, which was continued annually till 1744, when, in conſequence of the war, 20,000*l.* was granted, and in almoſt every year ſince, a ſum has been appropriated by parliament to this purpoſe.

As all the joint-ſtock companies which had been eſtabliſhed for this trade had appeared incompetent to carry it on with advantage, it was in 1750 (23 Geo. II. c. 31.) transferred to a regulated company, the members of which are deemed a body corporate and politic, under the title of *The Company of Merchants trading to Africa,* but are prohibited from trading in their corporate capacity, from having any joint or transferable ſtock, and from borrowing money under their common ſeal. Any perſon intending to trade to Africa, may become free of this company on payment of forty ſhillings; and out of the monies thus received, a ſum not exceeding 800*l.* is allowed for the ſalaries of clerks and agents at London, Briſtol, and Liverpool, the houſe-rent of their office at London, and all other expences of management, commiſſion, and agency in England. What remains of this ſum, after defraying theſe different expences, they may divide among themſelves, as compenſation for their trouble, in what manner they think proper. The forts, factories, &c. poſſeſſed by the old company on the coaſt of Africa, are veſted in the preſent company, who continue to receive an annual ſum from parliament (generally about 13,000*l.*) for the ſupport of theſe eſtabliſhments: the ſum granted in the year 1806 was 18,000*l.* For the proper application of this ſum, the committee is obliged to account annually to the curſitor baron of the exchequer, which account is afterwards to be laid before parliament.

The company is under the management of a committee of nine perſons, three being choſen for London, three for Briſtol, and three for Liverpool, annually. The committee are enjoined to lay an annual account of the application of the money granted to them before parliament.

Although by the 4th of Geo. III. c. 20. the fort of Senegal, with all its dependencies, had been veſted in this company, yet in the year following (by the 5th of Geo. III. c. 44.) not only Senegal and its dependencies, but the whole coaſt from the port of Sallee, in South Barbary, to cape Rouge, was exempted from the juriſdiction of that company, and veſted in the crown; the trade to it being declared free to all his majeſty's ſubjects.

Before the eſtabliſhment of the Royal African company, there had been three other joint-ſtock companies ſucceſſively erected one after another, for the African trade. They were all equally unſucceſsful. They all, however, had excluſive charters, which, though not confirmed by act of parliament, were in thoſe days ſuppoſed to convey a real excluſive privilege.

COMPANIES, *Engliſh.* The *Eaſt India Company* was eſtabliſhed by charter dated Dec. 31, 1600, by which the earl of Cumberland and 215 other perſons were authorized to carry on an excluſive trade to all parts of the Eaſt Indies, for 15 years; under the title of "The Governor and Company of Merchants of London trading to the Eaſt Indies." They raiſed 72,000*l.* in ſhares of 50*l.* each, and fitted out five ſhips, which accompliſhed their firſt voyage very ſucceſsfully, in two years and ſeven months.

Having carried on the trade for about ten years, with different degrees of ſucceſs, they obtained another charter dated May 31, 1610, by which the company was made perpetual. They had not yet adopted the mode of trading under one joint ſtock, but carried it on in ſeveral copartnerſhips and leſſer ſtocks. In 1613 the proprietors of the ſeveral ſeparate ſtocks, united them into one general joint-capital; and notwithſtanding ſome oppoſition to their trade, both at home, and abroad, they preſerved and extended it, having at this time eſtabliſhed factories at about twenty different places in India. In a vindication of the Eaſt India Company before the privy council, at a ſubſequent period, among other remarks for ſhewing the great difficulties attending an Eaſt India trade, it was aſſerted, that although they had a ſtock of 1,500,000*l.* yet in fifteen years time, *viz.* from 1617 to 1632, their whole profit was no more than 12 and one-half per cent.

In 1637, Charles I. eſtabliſhed a new company to trade to China and Japan, but it was ſoon ruined. The old company likewiſe from its differences with the Dutch Eaſt India company, the encroachments of private adventurers, and other cauſes, fell into decay, and in 1655 it was diſſolved by Cromwell, and the trade laid open. The miſchiefs which followed obliged him to re-eſtabliſh the company about three years after; their joint-ſtock was now 739,782*l.*, of which only one half, or 369,891*l.* was paid in, and was properly their capital. The total exports of the company in three years, ending with 1660, was 227,820*l.* in bullion, and 23,763*l.* in merchandize. After the reſtoration, they obtained a new charter from Charles II. dated April 3, 1661. By this charter it appears that the company had not then one ſole transferable joint-ſtock; but that every one, who was free of this company paid a certain ſum of money to the company on the fitting out of their fleet, for which he had credit in the company's books, and received his proportionate dividend on the profits of the reſpective voyage. The whole inveſtments were made by the company in their corporate capacity; but they were not eſtabliſhed as an irrevocable corporation, as they might be diſſolved on three years notice.

In 1664, the company's ſtock ſold at only 70 per cent., but in conſequence of an inquiry into the ſtate of their affairs, the reſult of which was very favourable, the ſtock ſoon got up conſiderably. New charters were granted in 1669 and 1676, confirming all their privileges. In the latter year, the company having made a conſiderable profit by their trade, agreed, inſtead of making a dividend thereof, to add it to their capital ſtock, ſo as juſt to double the ſame, by which their capital became 739,782 *l.* 10 *s.* In conſequence of the extenſion and ſucceſs of their trade, which enabled them to make large dividends, their ſtock in 1680 ſold from 280 to 300 per cent; but theſe great profits, and the doubtful authority on which they held their excluſive privileges, (not having the ſanction of parliament) being a great temptation to individual adventurers, interlopers, who had often given them much trouble, became again very numerous, and attempts were made to get the trade laid open, or to have it veſted in a regulated company ſimilar to thoſe by which the trade with Turkey and with ſome other countries was then carried on. The company, however, in 1683 found means to obtain a new charter, by which all their former privileges were confirmed, and they were empowered to ſeize the ſhips and merchandize of all interlopers, to raiſe and maintain military forces, to exerciſe martial law, and to eſtabliſh a court of judicature for determining all mercantile cauſes, within their limits. In 1686 they obtained another charter granting them ſtill greater powers and privileges.

Soon after the revolution much popular clamour was raiſed againſt the Eaſt India company; and in 1691 the houſe of commons addreſſed the king to diſſolve the company and incorporate a new one; an opportunity for which ſoon occurred, as in 1693, the charter of the company became void, from their not paying the duty which had been impoſed on their ſtock within the time limited by the act; but a new charter was granted them, on condition of ſubmitting to ſuch regulations as ſhould be ordained before the 29th of September 1694 and which were contained in two charters ſoon afterwards executed.

In 1698 the complaints of the weavers of London againſt the importation of India wrought ſilks, and the company having been prevented by loſſes from making any dividends for ſeveral years, brought it into much diſrepute, and the houſe of commons thought it neceſſary to take the ſtate of their affairs into conſideration. The company thought it prudent to offer to advance 700,000 *l.* for the public ſervice at 4 per cent. intereſt, provided the excluſive trade was legally ſettled on them; but a number of merchants, countenanced by the chancellor of the exchequer, propoſed to advance 2,000,000*l.* at 8 per cent. intereſt, for ſimilar privileges. The latter propoſal was approved, and an act paſſed by which a new company was eſtabliſhed; many difficulties however appeared, with reſpect to their engaging in the trade, till the expiration of the three years notice for determining the old company. During this unſettled ſtate of the Eaſt India trade, the old company's ſtock had in about nine or ten years fluctuated from 300 per cent. to only 37 per cent.

The great contentions which enſued between the old and new companies, ſoon rendered it obvious that little benefit would be derived from the trade, unleſs a coalition between the two rival corporations was effected. This was accompliſhed in 1702, by an agreement that the old company ſhould purchaſe an equal proportion of ſtock in the new company, and that the ſeparate traders, who had ſubſcribed to the new company, but not to their joint-ſtock, ſhould be included in the union. The old company was to keep their ſtock in the new company, in their corporate capacity for ſeven years, then to transfer it to their reſpective members, and reſign their charter to the crown, from which time the new company comprehending the proprietors of both, aſſumed their preſent title of "The united Company of Merchants of England trading to the Eaſt Indies." In 1708 the term of their excluſive trade to India, which was determinable upon three years notice after 1711, and repayment of the ſum they had advanced, was prolonged to three years notice after Lady-day 1726; for which they advanced to government 1,200,000 without any additional intereſt. In 1712 they obtained an act for continuing the trade and corporation capacity of the company, although the ſums they had advanced to government ſhould be repaid; which repayment or redemption of their annual fund, was not to be made till the expiration of three years notice after Lady-day 1733.

The act of parliament being liable to a different conſtruction from what was probably intended, and the term granted being near its expiration, a very powerful oppoſition to its renewal, was raiſed in 1730, and ſpecious propoſals were made to parliament for redeeming the fund of the company, and transferring the trade to a regulated company, with ſimilar privileges. After a very full diſcuſſion of the ſubject, a new agreement was entered into with the company, who agreed to pay 200,000 *l.* towards the ſervice of the current year, and to have the intereſt payable to them by government reduced from 5 to 4 per cent.; in conſideration of which all their excluſive privileges were continued till the expiration of three years notice, to be given after Lady-day 1766, when upon re-payment of their entire capital of 3,200,000*l.* their excluſive privileges were to ceaſe, but the company to continue a corporation for ever, to enjoy the Eaſt India trade in common with all other ſubjects. In conſequence of this reduction of the intereſt received from government, they thought proper to reduce the dividend payable to their proprietors from 8 to 7 per cent. and ſoon after to 6 per cent.

In 1743 the company propoſed to advance 1,000,000 *l.* for the ſervice of the year 1744, at 3 per cent. intereſt, on having the term of their excluſive trade enlarged for fourteen years, and being permitted to borrow a million on bonds. This propoſal being accepted, the debt from the public to the company became 4,200,000*l.*, and the excluſive trade was now extended to three years notice, to be given by parliament after Lady-day 1780, with the former proviſion, that, after ſuch determination, the company ſhould continue to have a common right with other ſubjects in the trade to India.

The company not ſubſcribing to the reduction of intereſt propoſed in 1749, the ſpeaker of the houſe of commons was ordered to give them notice that the ſum due from government would be paid off, unleſs they ſubſcribed before May 30, 1750: with this it was deemed prudent to comply, but a condition was made, that in order to enable the company to reduce their bond debt, they ſhould be empowered to raiſe money by the ſale of 3 per cent. annuities, to the amount of the debt of government to the company. The annuities thus ſold were known by the title of 3 per cent. India annuities, and were for many years payable at the India houſe, but are now conſolidated with the 3 per cent. reduced bank annuities.

Hitherto the company had not aſpired beyond their original character of merchants, and merely poſſeſſed factories at the principal ports to which they traded; theſe factories were, for the ſafety of their merchandize and the protection of their ſervants, converted into forts, which rendered it neceſſary to maintain a military eſtabliſhment. Thus poſſeſſed of the means of offence as well as defence, they made conſiderable exertions to oppoſe the progreſs of the French in thoſe parts; and as the two companies each endeavoured to procure the aſſiſtance of the neighbouring native princes, the field of intereſt and ambition became much enlarged. In 1751, the company ſent a conſiderable military force into the province of Arcot to ſupport the nabob againſt his rival, who was powerfully aſſiſted by the French; in which conteſt they were engaged with little intermiſſion for ſeveral years. In Bengal, the company had carried on their commercial intercourſe without any connexion with territorial authority, till the death of the ſubah Ali-Verdi-Khan, in 1756. This prince had viewed their increaſing opulence and power with great jealouſy, and a ſhort time before his death gave a remarkable charge to his ſucceſſor, in which he cautioned him to keep in view the power of the European nations in his country, and to free himſelf from their influence as ſoon as poſſible. "The power of the Engliſh is great; reduce them firſt; the others will then give you little trouble. Suffer them not to have forts or ſoldiers; if you do, the country is not yours." In attempting to put this advice into execution, Sou-Rajah-Dowla was completely defeated by the company's forces, and the new ſubah of their appointment, beſides paying to the company a very large ſum for their loſſes and expences, ceded to them a conſiderable territory in the vicinity of Calcutta. On the coaſt of Coromandel, hoſtilities were carried on againſt the French ſettlements with unequal ſucceſs, but ultimately to the advantage of the Engliſh, upon which the ſubah of the Decan concluded a treaty with the company, and ceded to them the entire circar of Maſulipatam. In 1760, the company's forces completely defeated thoſe of France, and in the following year captured Pondicherry, the chief of the French ſettlements in India; ſince which events the power of France in India has been very inſignificant.

Such was the commencement of the company's acquiſitions of territory, which they have ſeized every ſubſequent opportunity of extending, till the ſovereigns of India, whoſe protection they formerly courted, have ſunk into the ſituation of their dependents, and hold their precarious dignities at the will and pleaſure of a ſociety of foreign traders.

The annual ſales of the imports of the company for ſixteen years preceding 1757, amounted on an average to about 2,055,000*l.*; and for the ſame period, the exported goods and ſtores amounted annually, at their prime coſt, to 238,000*l.*; the bullion exported to 690,000*l.* per annum, and they paid in diſcharge of bills of exchange 190,000*l.* per annum.

Early in 1764, on the receipt of ſome unpleaſant news from Bengal, India ſtock fell 14 per cent. The general adminiſtration of the company's affairs, both at home and abroad, became ſoon after the ſubject of much diſcuſſion; and on 29th Auguſt 1766, the court of directors received a notice from the ſecretaries of ſtate, that an inveſtigation would take place in the next ſeſſion of parliament. The adminiſtration laid claim to the territories which the company had acquired in India, with the revenue ariſing from them, as of right belonging to the crown; but as the company were very unwilling to have this new ſource of wealth taken out of their hands, a temporary agreement was made for two years, by which the company, in compenſation for this claim, agreed to pay to government 400,000*l.* a year. In 1769, the agreement was renewed for five years, and the territorial acquiſitions and revenues in India ſecured to the company for that term, with a ſtipulation that the company ſhould be allowed to increaſe their dividend to 12½ per cent., but not to increaſe it more than one per cent. in one year.

They now became involved in a war with the famous Hyder Ally, in conſequence of which, and of the miſconduct of their ſervants in India, the concerns of the company, from the moſt flouriſhing ſituation, were brought into the greateſt embarraſſments. Select and ſecret committees of the houſe of commons were appointed to inveſtigate the ſtate of their affairs; and in 1773, it appeared, not only that they were unable to make the ſtipulated annual payment to government, but that it was neceſſary to aſſiſt them with a loan of 1,400,000. Till this ſum ſhould be repaid, the dividend to their proprietors was not to exceed 6 per cent., and afterward not to exceed 7 per cent. till their bond debt was reduced to 1,500,000*l.* From theſe circumſtances, the price of the company's ſtock fell conſiderably from the latter part of 1772 till February 1774, when their affairs began to wear a brighter aſpect. In 1776, the loan from government had been repaid, and their ſituation being otherwiſe improved, the dividend on their ſtock was raiſed to 8 per cent.

Statement of the Company's Revenues, at their different Settlements in India, in the Year ending April 1777.

To expences in Bengal, civil, military, and fortifications	£1,350,000	By nett revenues in Bengal	£2,500,000
To ditto at Fort St. George	560,000	Benares tribute	290,000
To ditto at Bombay	360,000	Oude ſubſidy	370,000
		By revenues of Fort St. George and the Circars	560,000
	2,270,000	Tanjore ſubſidy	160,000
Nett balance of the year's revenues	1,770,000	By revenues of Bombay, &c.	160,000
	£4,040,000		£4,040,000

On an average of ten years, ending with 1777, the company's exports in goods were about 490,000*l.*; in bullion, 110,000*l.*; and the ſum paid in diſcharge of bills of exchange, 458,000*l.* per annum. By the aid afforded from the revenues, their inveſtments were increaſed, ſo as to produce about 3,330,000*l.* per annum.

In 1779, an act was paſſed for continuing the territories and revenues in India in the poſſeſſion of the company for one year, which in 1780 was continued for another year. In June 1781, it was agreed to offer to pay into the exchequer 400,000*l.*, in full diſcharge of all claims of the public upon the company up to the 1ſt of March; and as, in the preceding year, they had received notice that the 4,200,000*l.* due to them from government would be paid off on the 10th of April, 1783, it became neceſſary to enter into a new agreement, the conditions of which were, that the company ſhould continue to enjoy their excluſive privileges to the 1ſt of March, 1794, then to ceaſe and determine, upon the former conditions of three years previous notice, and the repayment of all ſums due to them. The ſurplus of their nett profits, after paying their dividends, were appropriated, three fourths for the ſervice of government, and one fourth to be retained by the company; and they were reſtricted not to increaſe the dividend of 8 per cent. more than 1 per cent. in any year. This reſtriction was, however, ſoon found unneceſſary; for the nett profits of the company for the year ending 1ſt of March, 1782, did not amount to ſo much as a dividend of 8 per cent. on their ſtock by 22,023*l.*; in conſequence of which, it became neceſſary for government to allow a farther time for the payment of 396,466*l.* 2*s.* 6*d.*, which was due from the company for cuſtoms, beſides a part of the ſum which they had agreed to pay in 1781; and they were at the ſame time empowered, notwithſtanding the above deficiency, to continue their dividends at 8 per cent. In the following year, the war in India, and other circumſtances, increaſed the embarraſſment of the company's affairs; and, by a ſtatement of their accounts to the 1ſt of March, 1783, it appeared that the nett profits of that year did not amount to a dividend of 8 per cent. by 255,813*l.*, which dividend they were nevertheleſs authorized by parliament to continue; and, to enable them ſo to do, government iſſued exchequer bills to the amount of 300,000*l.*, which the bank undertook to lend money upon to the company.

The long and expenſive war in which the company had been engaged in India, terminated in March 1784, by the ratification of peace with the Myſorean government; but the conſequence of this war, in addition to the war in Europe, was the general derangement of the company's affairs both at home and abroad. In December 1783, February and May 1784, the directors laid before parliament ſuch accounts as they then poſſeſſed, reſpecting the general ſtate of their finances. But the impoſſibility of drawing any ſatisfactory information from ſtatements made up in ſuch a ſituation of their affairs, with the apprehenſions which the meaſures then in agitation, relative to the future government of India, had excited in the public mind, reduced the credit of the company to the loweſt ebb. Their ſtock ſold as low as 118½; their bonds at home, bearing 5 per cent. intereſt, were negociated from 2½ to 4 per cent. diſcount; their bonds and certificates, at Bengal and Madras, bore from 18 to 40 per cent. diſcount; at Bombay 50 per cent.; and orders on the treaſury there ſold at 65, and upwards, per cent. diſcount.

It now became a general conviction, that the company was incompetent to the political government of the extenſive territories which they had acquired. A Board of Controul was therefore eſtabliſhed, compoſed of a certain number of commiſſioners to be appointed by the king, and removeable at his pleaſure. This board was authorized to check, ſuperintend, and controul, the civil and military government and revenues of the company. The diſpatches tranſmitted by the directors to the different preſidencies were to be previouſly ſubjected to the inſpection of the Board. The appointment of governor-general, preſident, or counſellor in the different preſidencies, was made ſubject to the approbation and recall of his majeſty; and ſuch other regulations adopted, as in a great meaſure deprived the company of that political and civil authority which they had ſuffered to be ſo groſsly abuſed.

In 1786 ſome further regulations were made reſpecting the government of India; and, as the company's trade was increaſing, particularly in the article of tea, their import of which had been greatly augmented by the arrangement of the commutation act, they were ſaid to require a greater capital, and were authorized to create 800,000*l.* new ſtock, on which they raiſed 1,240,000*l.* at the rate of 155 per cent. In 1789 they obtained another act, enabling them to add 1,000,000*l.* to their capital, which thus became 5,000,000*l.*

In the beginning of 1793, the term of the company's excluſive privileges being nearly expired, the ſubject of laying open the trade to India was again diſcuſſed, and though it was not thought proper to riſk the loſs and confuſion which muſt unavoidably attend any attempt to take ſuch an immenſe concern out of the hands in which it has ſo long continued, a ſtipulation was made in the agreement for the renewal of the charter, that ſuch regulations ſhould be adopted as to admit of a free exportation by private perſons on their own account, of any goods of the growth, produce, or manufacture of Great Britain or Ireland; and of a free importation of ſuch ſorts of the raw materials of the Eaſt Indies as are uſed in the manufactures of Great Britain or Ireland; that the company ſhould be obliged to provide ſhipping for the carriage of the private trade, at as low a freight as it could be furniſhed by private merchants; and that they ſhould licenſe a proper number of agents to reſide at the company's ſettlements, under their protection, for the management of the private trade. On theſe conditions the company's term in the excluſive trade was enlarged for 20 years, or to the 1ſt of March, 1814, with the former proviſo, that if, after the expiration of that term, their right to the ſole trade ſhall ceaſe, in conſequence of three years previous notice being given by parliament, and the repayment of ſuch ſums as may be then due from the public, they ſhall continue a corporation, with power to carry on a free trade in common with other perſons.

On this occaſion, the total income of the company, ariſing both from their territorial revenues and their commercial concerns, was ſtated as follows:

The nett annual income in rents and profits of trade, taken in the moſt unfavourable light to the company, and ſuppoſed to be conſiderably under the mark, was rated at - - -		£2,329,164
Subject to the following payments, *viz.*		
Intereſt of 3,200,000*l.* on bond, at 4 per cent. - - -	£128,000	
Ditto of 6,669,082*l.* debt in India, at various rates of intereſt, on a medium about 8¾ per cent. - -	561,923	
Dividend of 8 per cent. on their capital of 5,000,000*l.* - - - - -	400,000	
		1,089,923
Leaving a nett annual ſurplus of - - - -		£1,239,241

Of this ſurplus it was propoſed to appropriate 500,000*l.* per ann. to the reduction of the debt in India, to pay 500,000*l.* per annum to government in half-yearly payments, and to pay an increaſed dividend of 10 per cent. to their proprietors on 6,000,000*l.* to which ſum their capital was now raiſed.

This annual ſurplus, if it really exiſted at the time to which the above account refers, was of very ſhort duration. In 1795 the company found themſelves unable to continue the propoſed contribution to government; and the intrigues of Tippoo Saib with the French, and with ſome of the native powers, which obliged the company to keep up a large military eſtabliſhment, and ſoon after to engage in another expenſive war, not only reduced the ſurplus of their revenues, but occaſioned a conſiderable increaſe of debt in India, which has ſince been further augmented in conſequence of hoſtilities with Dowlut Rao Scindia and Jeſwunt Rao Holkar.

In order to furniſh ſome idea of the extent of the company's commercial and financial concerns, the following accounts are ſubjoined.

The amount of all goods ſold at the Eaſt India Company's ſales, from the 1ſt of March 1805 to the 1ſt of March 1806.

Company's goods; *viz.*

Teas - - - - - - - - -	£3,620,904	
Bengal piece goods - - - - -	621,862	
Coaſt and Surat piece goods - -	614,317	
Raw and organzine ſilk - - - -	274,459	
Nankeens - - - - - - - -	[illegible]	
Pepper - - - - - - - - -	121,844	
Saltpetre - - - - - - - -	217,769	
Spices - - - - - - - - -	114,245	
Drugs, ſugar, coffee, &c. - - -	348,350	
		5,999,29[illegible]

Private Trade goods, *viz.*

Teas	£239,215	
Piece goods	772,517	
Raw ſilk	44,228	
Nankeens	21,489	
Pepper	10,633	
Saltpetre	144	
Drugs, ſugar, indigo, &c.	1,693,926	
		2,782,152
Total		£8,781,442

An Eſtimate of the revenues and charges in India, for the year 1806-7.

Revenues.

Bengal	£9,148,711
Madraſs	5,021,325
Bombay	677,203
Total	£14,847,239

Charges.

Bengal, civil and military expences	£6,944,607
Madraſs - - - do.	5,379,218
Bombay - - - do.	1,826,516
Commercial charges not added to invoices	192,769
Intereſt of debts	2,275,300
Supplies to Prince of Wales' iſland, &c.	185,600
Total	£16,804,010
Deduct eſtimated revenues	14,847,239
Deficiency	£ 1,956,771

Account of the actual receipts and payments of the Eaſt India Company, in Great Britain, for one year, ending the 1ſt of March 1807.

Receipts.

	£	s.	d.
Caſh in the Treaſury 1ſt March 1806	669,794	6	2
For company's goods ſold	5,294,384	13	8
Of the board of ordnance for ſaltpetre	160,000	0	0
Private trade goods ſold	2,114,269	8	10
Charges and profit on private trade	163,462	19	2
Cuſtoms on do.	73,380	19	5
Freight on do.	119,784	18	10
Intereſt on red. 3 per cent. annuities	36,266	15	10
Of government, on account of a ſum due to the company	1,000,000	0	0
Alms-houſes at Poplar	2,416	18	2
Perſons returned from India	17,516	0	0
Bonds iſſued	517,000	0	0
Duty on tea received	3,120,290	12	3
Total	£13,288,527	12	4

Payments.

	£	s.	d.
Cuſtoms	161,736	14	0
Freight and demorage	1,689,040	9	4
Goods and ſtores exported	2,270,793	7	8
India debt	50,223	19	5
Bills of exchange from India	342,885	1	8
Ditto from China	641,994	16	8
Bullion exported	514,432	16	8
Charges of merchandize, including ſupra cargoes, commiſſion, intereſt on loans, &c.	623,652	14	11
Dividends on ſtock and intereſt on bonds	770,429	19	1
Bonds paid off and paid in on ſales	216,600	0	0
Proprietors of private trade	2,169,021	15	0
Pay to marine and military officers on furlough, and retired from ſervice	141,319	15	0
Duty on tea paid	3,184,417	6	7
Caſh in the treaſury 1ſt March 1807	511,978	16	4
	£13,288,527	12	4

The vaſt concerns of this company are under the management of twenty-four directors, who are formed into different committees; each committee having the ſuperintendence of a particular department of the company's buſineſs. At the general courts of proprietors, perſons poſſeſſing 1000*l.* ſtock have one vote; 3000*l.* two votes; 6000*l.* three votes; and 10,000*l.* four votes. The number of proprietors entitled to vote, on the 8th of April 1800, was 2163, and the number of votes 2832.

Company, *Hamburgh*, is the oldeſt trading eſtabliſhment in the kingdom; though not always known by that name, nor reſtrained to thoſe narrow bounds under which it was afterwards confined. It was firſt called, the Company of Merchants trading to Calais, Holland, Zealand, Brabant, and Flanders: then it acquired the general title of Merchant-adventurers of England; as being compoſed of all the Engliſh merchants who traded to the Low Countries, the Baltic, and the German ocean. Laſtly, it was called the Company of Merchant-adventurers of England trading to Hamburgh.

This company was not a ſociety of dealers, each furniſhing a part of the ſum to conſtitute the capital ſtock of the company; but a mere aſſociation, or body of merchants, who had nothing in common, but the grant and privilege of trading to Hamburgh, and ſome other cities of Germany; each managing his own commerce, and trading on his own foundation; only obſerving a certain diſcipline, and ſome regulations, which none but the company could eſtabliſh or change.

This company was firſt incorporated by Ed. I. in 1296; and eſtabliſhed again, by charter, in 1406, under the reign of Henry IV. It was afterwards confirmed and augmented with divers privileges, by many of his ſucceſſors; among the reſt, by Henry V. in 1413; Henry VI. in 1422; Henry VII. in 1493, 1505, and 1506; Henry VIII. in 1509, 1517, and 1536; Edward VI. in 1547; queen Mary, in 1553; Elizabeth, in 1564, and 1586; James I. in 1605; and Charles II. in 1661. But of all theſe charters, none but thoſe of Henry IV. Henry VII. Elizabeth, James, and Charles, were of any importance, or gave the company any thing new; the reſt being only confirmations. Before the charter of Henry IV. all the Engliſh merchants, who trafficked out of the realm, were left to their own diſcretion, and managed their affairs with foreigners as might be moſt for their reſpective intereſts; without any regard to the general commerce of the nation.

Henry obſerving this diſorder, endeavoured to remedy it, by uniting all the merchants in his dominions into one body; wherein, without loſing the liberty of trading each for himſelf, they might be governed by a company; and be ſubject to regulations, which ſhould ſecure the general intereſt of the national commerce, without prejudice to the intereſt of particulars. With this view, he granted all the merchants, of his ſtates, particularly thoſe of Calais, then in his hands, a power of aſſociating themſelves into a body politic, with directors and governors, both in England and abroad; to hold aſſemblies both for the direction of buſineſs and the deciding of controverſies among merchants; make laws, puniſh delinquents; and impoſe moderate duties and taxes on merchandizes and merchants to be employed in the ſervice of the corporation.

Theſe few articles of the charter of Henry IV. were afterwards much augmented by Henry VII. who firſt gave them the title of Merchant-adventurers to Calais, Holland, &c. gave them a power of proclaiming and continuing free fairs at Calais; and ordered, that to be reputed a member of the ſociety, each perſon ſhould pay twenty marks ſterling; and that the ſeveral members ſhould attend the general meetings, or courts, appointed by the directors, whether at London, Calais, or elſewhere.

The inexecution of this laſt article and contempt of ſome of the reſt, occaſioning great inconveniences to the company's affairs, another charter was procured, whereby the pain of impriſonment was menaced, for thoſe who ſhould abſent themſelves from the meetings without lawful cauſe, or ſhould diſobey the laws. A petition being made to queen Elizabeth, in 1564, for an explanation of certain articles in the charter of Henry VII. and a confirmation of the reſt granted by other kings; that princeſs, by a charter of the ſame year, declares, that to end all diſputes, they ſhould be incorporated anew under the title of the "Company of Merchant-adventurers of England;" that all who are members of the former company ſhould, if they deſire it, be admitted members of this; that they ſhould have a common ſeal; that they ſhould admit into their ſociety what other perſons, and on what terms, they pleaſe; and expel them again on miſbehaviour; that the city of Hamburgh, and neighbouring cities, ſhould be reputed within their grant, together with thoſe of the Low Countries, &c. in that of the former company; that no member ſhould marry out of the kingdom, nor purchaſe lands, &c. in any city beyond ſea; and that thoſe who do, ſhall be *ipſo facto* excluded for ever.

Twenty-two years after this firſt charter, queen Elizabeth granted them a ſecond; confirming the former, and further granting them a privilege of excluſion, with a power of erecting in each city within their grant, a ſtanding council.

The woollen manufacture being the principal object of their application, they met with great oppoſition; firſt, from the Hanſe, who forced them frequently to change their mart, or ſtaple; and afterwards under king James I. who having erected a corporation in 1616, in favour of ſome private perſons, who offered to ſet up a manufacture for dyeing and preſſing cloths, &c. under pretence thereof the company of merchant-adventurers were prohibited dealing therein. But that project not ſucceeding, and the charter being revoked two years afterwards, the merchant-adventurers, whoſe company had been diſſolved two years before, were reſtored in 1617, to their ancient privileges, and a new charter was given them, confirming their excluſive rights; and allowing them to have officers in the ſeveral cuſtom-houſes, to have an eye that they were not prejudiced in their woollens, under pretence of the like merchandizes, which others were allowed to ſend to other parts. This charter of king James, is the laſt of thoſe confirmed by Charles II. in the grand charter of 1661.

The revolutions which had happened in the Low Countries towards the end of the ſixteenth century, and which laid the foundation of the republic of Holland, having hindered the company from continuing their commerce with their ancient freedom; it was obliged to turn it almoſt wholly to the ſide of Hamburgh, and the cities on the German ocean; from which change ſome people took occaſion to change its name to that of the Hamburgh company, though the ancient title of Merchant-adventurers is ſtill retained in all their writings.

This ſociety was greatly reduced, when its trade was laid open by William III. and the company is now extinct.

COMPANY *of Merchants of the Staple* was incorporated by Edward III. Their factory was at Middleburgh, in Zealand; but the ſtaple being removed, in 1389, to Calais, it was ſoon after, *viz.* in 1390, removed from thence to England.

COMPANY, *Ruſſia*. This was firſt projected towards the end of the reign of king Edward VI. executed in the firſt and ſecond years of Philip and Mary; but had not its perfection, till its charter was confirmed by act of parliament, under queen Elizabeth, in 1566. It had its riſe from certain adventurers, who were ſent in three veſſels on the diſcovery of new countries; and to find out a north-eaſt paſſage to China; theſe, falling into the White ſea, and making up to the port of Archangel, were exceedingly well received by the Muſcovites; and at their return, ſolicited letters patent to ſecure to themſelves the commerce of Ruſſia, for which they had formed an aſſociation.

The charter was promiſed them by Edward VI. but he dying, was firſt diſpatched by queen Mary, in 1555. By this charter, the aſſociation was declared a body politic, under the name of the "Company of Merchant-adventurers of England, for the diſcovery of lands, territories, iſlands, &c. unknown or unfrequented." Their privileges were, to have a governor, four conſuls, and twenty-four aſſiſtants, for their commerce; for their policy, to make laws, inflict penalties, ſend out ſhips to make diſcoveries, take poſſeſſion of them in the king's name, ſet up the banner royal of England, plant them; and laſtly, the excluſive privilege of trading to Archangel, and other ports of Muſcovy, not yet frequented by the Engliſh.

This charter, not being ſufficiently guarded, was confirmed by parliament in the eighth year of queen Elizabeth; wherein it was enacted, that in regard the former name was too long, they ſhould now be called "Company of Engliſh Merchants for diſcovering new trades;" under which name, they ſhould be capable of acquiring and holding all kinds of lands, manors, rents, &c. not exceeding a hundred marks per ann. and not held of her majeſty; that no part of the continent, iſland, harbour, &c. not known nor frequented before the firſt enterprize of the merchants of their company, ſituate to the north, or north-weſt, or north-eaſt of London; nor any part of the continents, iſlands, &c. under the obedience of the emperor of Ruſſia, or in the countries of Armenia, Media, Hyrcania, Perſia, or the Caſpian ſea, ſhould be viſited by any ſubjects of England, to exerciſe any commerce without the conſent of the ſaid company, on pain of confiſcation. The ſaid company ſhall uſe no ſhips in her new commerce, but thoſe of the nation; nor tranſport any cloths, ſerges, or other woollen ſtuffs, till they have been dyed and preſſed. That in caſe the company diſcontinue of itſelf to unload commodities in the road of the abbey of St. Nicolas, in Ruſſia, or ſome other port, on the north coaſts of Ruſſia, for the ſpace of three years, the other ſubjects of England ſhall be allowed to traffic to Narva, while the ſaid company diſcontinues its commerce into Ruſſia, only uſing Engliſh veſſels.

This company ſubſiſted with reputation almoſt a whole century, till the time of the civil wars. It is ſaid, the czar then reigning, hearing of the murder of king Charles I. ordered all the Engliſh in his ſtates to be expelled; which the Dutch taking the advantage of, ſettled in their room

After the reſtoration, the remains of the company re-eſtabliſhed part of their commerce at Archangel, but never with the ſame ſucceſs as before: the Ruſſians being now well accuſtomed to the Dutch merchants, and merchandize.

This company ſubſiſts ſtill, nearly on the foot of that of Hamburgh, and the northern and Turkey companies; i. e. each member thereof trafficks for himſelf, and on his own foundation; only paying an acknowledgement as fine for admiſſion, which was reduced by 10 and 11 W. III. c. 6, to five pounds; beſides ſome other dues impoſed, from time to time, for the occaſions of the company, and the commerce in general. It is under the direction of a governor, four conſuls, and aſſiſtants.

COMPANY, *Eaſtland*, is eſtabliſhed on ſimilar ground with that of Hamburgh; from whence it appears to have been diſmembered.

Its charter is dated in the year 1579. By the firſt article the company is erected into a body politic, under the title of the "Company of Merchants of the Eaſt;" to conſiſt of Engliſhmen, all real merchants, who have exerciſed the buſineſs thereof, and trafficked through the Sound, before the year 1568, into Norway, Sweden, Poland, Livonia, Pruſſia, Pomerania, &c. as alſo Revel, Koningſberg, Dantzick, Copenhagen, &c. excepting Narva, Muſcovy, and its dependencies. Moſt of the following articles grant them the uſual prerogatives, of ſuch companies; as a ſeal, governor, courts, laws, &c.

The privileges peculiar to this company are, that none ſhall be admitted a member who is already a member of any other company; nor any retail dealer at all. That no merchant qualified, be admitted without paying 6 *l.* 13 *s.* 6 *d.* By 29 C. II. c. 7. the fee of admiſſion into this company was reduced to 2 *l.* That a member of another company, deſiring to renounce the privileges thereof, and to be received into that of the Eaſt, ſhall be admitted *gratis;* provided he procures the ſame favour for a merchant of the Eaſt, willing to fill his place. That the merchant adventurers who never dealt in the Eaſt, in the places expreſſed in the charters, may be received as members of the company on paying forty marks; that, notwithſtanding this union of the adventurers of England with the company of the Eaſt, each ſhall retain its rights and privileges. That they ſhall export no cloths but what are dyed and preſſed, except a hundred pieces per annum, which are allowed them *gratis*.

This charter was confirmed by Charles I. in 1629, with this addition; that no perſon of what quality ſoever, living in London, ſhould be admitted a member, unleſs he were free of the city.

This company was complained of as a monopoly, and firſt curtailed by legal authority in 1672; and ſince the declaration of rights in 1689, exiſts only in name; but they ſtill continue to elect their annual officers, who are a governor, deputy, and twenty-four aſſiſtants.

COMPANY, *Turkey*, or *Levant*. This once flouriſhing body had its riſe under queen Elizabeth, who, in 1581, incorporated a ſmall number of merchants, with the privilege of an excluſive trade to Turkey for ſeven years. James I. in 1605, confirmed their charter, with the addition of ſome new privileges. During the civil wars ſome innovations were made in the government of the company; many perſons having been admitted members, not qualified according to the charter, or who did not conform to the regulations preſcribed, in conſequence of which Charles II., upon his reſtoration, endeavoured to place it upon its ancient baſis, for which purpoſe he gave them a new charter, containing a confirmation of the old one with ſome additional articles. By this charter the company was declared to be a body politic, capable of making laws, &c. under the title of "The Company of Merchants of England trading to the Seas of the Levant." The number of members was not limited, but no perſon reſiding within twenty miles of London, excepting noblemen and gentlemen of quality, was to be admitted into the company, unleſs firſt made free of the city of London: thoſe under 26 years of age were to pay 25 *l.* for their admiſſion, and thoſe above that age 50 *l.* Theſe fines were reduced by an act paſſed in 1753, (26 Geo. II. c. 18.) by which it is directed that every ſubject of Great Britain deſiring admiſſion into the Turkey company, ſhall be admitted within thirty days after ſuch requeſt, and ſhall enjoy all the liberties and privileges of the company, on paying for ſuch admiſſion the ſum of 20 *l.*

All perſons free of the company may, ſeparately or jointly, export any goods or merchandize (not prohibited) from any place in Great Britain, to any place within the limits of the company's charter, in Britiſh or plantation built ſhips, navigated according to law, at any time, and to any perſons whomſoever, being free of the company, or to the ſons or apprentices of freemen, ſo long as they ſhall remain under, and ſubmit to, the direction of the Britiſh ambaſſador and conſuls for the time being; and may alſo import, in like manner, any commodities purchaſed within the company's limits, on payment of the government duties, and ſuch impoſitions as ſhall be aſſeſſed upon all merchandize ſo exported or imported, or upon ſhips laden therewith, for defraying the neceſſary expences of the company.

The company is under the management of a governor, a deputy governor, and fifteen directors; they have alſo a deputy governor in every city and port where there are any members of the company. They preſent the ambaſſador which the king is to keep at the Porte, and elect two conſuls for Smyrna and Conſtantinople; allowing a fixed ſalary or penſion to the ambaſſador and conſuls, and even to their chief officers, as ſecretary, chaplain, interpreters, and janizaries, that they may not have any pretence for raiſing any ſum whatever on the merchants or merchandize. For defraying theſe charges the company have power to levy duties on the merchandize imported or exported by their members; but of late years they have frequently found it neceſſary to apply to parliament for pecuniary aſſiſtance.

The commerce of this company was formerly very conſiderable, having been eſtimated nearly equal to that of the Eaſt India company in extent, and much more advantageous to Great Britain; but the convenient ſituation of the French ports in the Mediterranean for the Levant trade, gives that country ſuch a decided advantage, that the commerce of Great Britain with Turkey has long been on the decline. In 1797, in order to avoid the hazard to which Britiſh veſſels in the Levant trade were expoſed in conſequence of the war, an act was paſſed giving permiſſion to the members of the Turkey company to import the goods uſually brought from Turkey, Egypt, or other parts of the Turkiſh dominions in the Levant ſeas, from any port whatſoever, either in Britiſh veſſels or veſſels belonging to any friendly nation, on paying, if in Britiſh veſſels, the ſame duties which would have been payable if the goods had been imported directly from the place of their growth, and, if in foreign veſſels, the duties to which they were before liable; but no entry of ſuch goods was to be made at the cuſtom houſe till the importer produced a certificate of his being a member of the Turkey company, and that he had paid the company's duties, and in all reſpects conformed to the company's regulations.

Company, *South Sea*, originated in a project for relieving the government from the embarraſſment of a large amount of unfunded debts, and conſiderable deficiencies in the funds appropriated for the payment of others; the proprietors of theſe debts being incorporated for the oſtenſible purpoſe of eſtabliſhing a trade to the ſouth ſeas and the N.W. coaſt of America. The capital of the company was 9,177,967*l.* 15*s.* 4*d.*; but this being ſubſcribed wholly in government ſecurities, they iſſued bonds in 1712, for raiſing 200,000*l.* in caſh in order to fit out their firſt mercantile adventure. In the following year, they obtained the Aſſiento contract, by which they agreed to import into the Spaniſh Weſt Indies 144,000 negroes, within the term of 30 years, at the rate of 4800 in each year, and were allowed to ſend a ſhip of 500 tons yearly to trade with the Spaniſh ſettlements, on condition that the king of Spain ſhould have a fourth part of the gain by ſuch ſhip, and receive five per cent. on the nett gain of the other three parts. See Assiento.

The firſt voyage of their annual ſhip was in 1717, and the company were again empowered to borrow money under their common ſeal, for carrying on their trade, or to enable them to fulfil an engagement with government to advance two millions towards carrying into execution a propoſed reduction of intereſt on the public debts. On the war breaking out in the following year, a ſtop was put to their trade with the Spaniſh Weſt Indies, by the ſeizure of their effects, by which they ſuſtained a very conſiderable loſs.

Soon after this interruption of their commercial concerns, they engaged in a ſcheme for converting ſome of the government terminable annuities into redeemable debts. They had, in 1715, for the accommodation of government, agreed to increaſe their capital to 10,000,000*l.*, which, by the annuities now purchaſed, and an advance to government, became 11,746,844*l.* 8*s.* 10*d.*; and although the ſcheme did not completely ſucceed, it prepared the way for the much more extenſive project of taking in all the public debts, and thus reducing all the public funds which then exiſted into one.

The mere rumour of this mercantile project raiſed the price of the company's ſtock to 126 per cent.; and, in the beginning of 1720, while the bill for carrying it into execution was depending in parliament, their ſtock got up from 137 to 319 per cent. As the tranſaction conſiſted merely in taking the public debts at a fixed price, and giving the proprietors, in exchange, a certain quantity of the company's capital ſtock, at prices agreed upon between the company and the ſubſcribers, it is evident that the great gain which the company expected to make, could ariſe only from the current price of their ſtock being conſiderably above its real value. By a variety of artifices, and a general ſtock-jobbing infatuation, it was carried up to the enormous price of 1000 per cent.: the rapidity of its fall, however, exceeded that by which it roſe, as it was in a few weeks down to 130 per cent.; involving in ruin perſons of all deſcriptions who were engaged in the wild ſpeculations of the time. (See Bubble.) Had the tranſaction completely ſucceeded, the capital of the company would have amounted to 43,411,399*l.* 6*s.* 11$\frac{1}{4}$*d.*, but from ſome of the debts remaining unſubſcribed, it became 37,802,483*l.* 14*s.* 0$\frac{1}{2}$*d.* of which four millions were purchaſed in 1722 by the bank, and in the following year the remainder was divided into two equal parts, one of which was to be called the trading capital of the company, and the other to be diſtinguiſhed by the title of "The joint-ſtock of South Sea annuities," ſince called old South Sea annuities.

In 1724, the company undertook the Greenland whale fiſhery, which turned out very unprofitable: after eight voyages, they ſold their ſhips, ſtores, and utenſils, and found that their whole loſs upon this buſineſs, capital and intereſt included, amounted to 237,142*l.* 6*s.* 2*d.*

In 1753, three fourths of their trading capital, which had been reduced by ſums paid off in 1727, 1729, and 1732, to 14,651,103*l.* 8*s.* 1*d.*, was converted into an annuity ſtock called "New South Sea Annuities," only one fourth remaining as their trading ſtock; and, in the following year, they petitioned the king to be allowed to diſpoſe of the trade and tonnage of their annual ſhip under the Aſſiento contract, on account of the little profit they made by it, and to accept of ſuch equivalent as they could obtain from the king of Spain, who at length, to put an end to the many diſputes which had ariſen from this contract, agreed, in 1750, to pay 100,000*l.* to the company, as a compenſation for all claims under the Aſſiento contract, and from that period they have not carried on any trade whatever. The whole buſineſs of the company, therefore, now conſiſts in the management of the following public funds.

Their capital ſtock - -	£3,662,784	8	6
Old South Sea annuities -	11,907,470	2	7
New South Sea annuities - -	8,494,830	2	10
Three per cents., 1751 - -	1,919,600	0	0

The intereſt received from government on all theſe funds, is 3 per cent., but the dividend paid to the proprietors of the company's ſtock, is 3$\frac{1}{2}$ per cent.; on the old and new annuities, 3 per cent.

The company is under the management of three governors, and 21 directors; the qualification required for governor, is the poſſeſſion of 5000*l.* in the company's ſtock; for ſub-governor, 4000*l.*; for deputy-governor, 3000*l.*; and for a director, 2000*l.* Five hundred pounds ſtock, gives a right to one vote at the general courts; 2000*l.* to two votes; 3000*l.* to three votes; and 5000*l.* to four votes.

Company, *Scotch Darien.* This was eſtabliſhed with good proſpect at Edinburgh, in 1695, for the commerce of South America. In 1698, they ſent an armament and a colony, which they endeavoured to eſtabliſh in the iſthmus of Darien, which parts North and South America; but the Engliſh miniſtry not thinking proper to avow and ſupport the firſt ſucceſſes of the company, which had alarmed Spain, ever jealous of this part of her territories, the Scotch colony was diſperſed by the Spaniards in 1699, and thus vaniſhed the beſt project that ever was formed for diſputing with that nation the poſſeſſion of thoſe countries, from which ſhe pretends to exclude all other nations.

Company, *Hudſon's Bay*, was incorporated by charter, dated the 2d of May, 1670, under the title of "The Governor and Company of Adventurers of England, trading into Hudſon's Bay," with the excluſive privilege of trading to all parts within the entrance of the ſtreight commonly called Hudſon's ſtreights. The charter, however, not being confirmed by act of parliament, the company poſſeſs no excluſive rights whatever, any Britiſh ſubject being at liberty to ſail into Hudſon's Bay, to fiſh or traffick with the Indians as freely as the company; all the advantage the company have over other adventurers thither is merely the benefit of their own forts, ſuch as they are, by which their agents can reſide in ſo inhoſpitable a country during the winter, preparatory to their trading with the Indians againſt the arrival of their ſhips in the ſummer. According to the evidence given before a committee of the houſe of commons in 1749, the company then poſſeſſed four ſmall factories, erected at the mouths of the principal rivers, in which they employed about 130 perſons

ſons, and two ſmall houſes with only eight men in each; theſe buildings are neceſſarily ſtrong, as well to guard againſt the climate as againſt other dangers, and are furniſhed with artillery to command reſpect from the Indians; they have therefore been generally called forts, although no military force is kept for defending them: their inability in reſiſting any ſerious attack, was obvious in 1782, when the French, who at former periods had done the company much injury, deſtroyed their ſettlements, forts, merchandize, &c. to the eſtimated amount of near 500,000 *l*.

The capital of the company, it is ſaid, does not exceed 110,000 *l*. which is divided among a very ſmall number of proprietors. The commerce carried on by them is not of great extent, as it ſeldom employs above four or five ſhips of about 300 tons each. The articles exported by them are coarſe duffle cloth or blanketing, guns, piſtols, ſword blades, hatchets, powder and ſhot, ſpirits, tobacco, braſs kettles, buttons, fiſh hooks, looking glaſſes, &c.; the imports conſiſt of large quantities of beaver ſkins, and peltry of all kinds, bed feathers, quills, caſtoreum, whale fins, oil, and a few ſmaller articles.

The company is under the management of a governor, deputy governor, and a committee of ſeven members.

Company, *Sierra Leone,* was ſet on foot in the year 1791, with the philanthropic view of introducing civilization into Africa. The principal means propoſed for effecting this end was the eſtabliſhment of a ſecure factory for carrying on an extenſive commercial intercourſe with the interior; but before the arrangements for this purpoſe were completed, the reception into the ſettlement of near 1200 blacks, who had taken part with Great Britain in the American war, and had petitioned the government to be removed from Nova Scotia on account of the coldneſs of the climate, involved the company in conſiderable difficulties, and gave a new character to the undertaking. Their expences, from various cauſes, became much greater than could have been foreſeen, amounting in the firſt two years and a half to 111,500*l*. and were ſtill further increaſed in 1793 by the war, which at the ſame time greatly interrupted their trade, and ſubjected them to depredations. In October 1794, the colony was attacked by a French ſquadron, and all the moveable property of the company was either carried off or deſtroyed, every building belonging to them burnt, and ſeveral ſhips captured. The company's loſs on this occaſion has been eſtimated at 52,000 *l*. This calamity, combined with their previous expences, ſo greatly diminiſhed the company's funds, as to lay them under a neceſſity of contracting their trade, and reducing conſiderably the ſcale of their eſtabliſhment, which had been at all times ſo limited as ſcarcely to afford ſufficient means of tranſacting the buſineſs and attending to the various wants of an infant ſettlement.

In the year 1798 the colony had made conſiderable progreſs, notwithſtanding the many obſtacles to its advancement. The town conſiſted of about three hundred houſes, with the neceſſary public buildings, and had become a place of conſiderable reſort. It was eſtimated that from one to two hundred natives viſited the ſettlement every day, many of them coming from a diſtance of eighty or a hundred miles, for the purpoſe of exchanging articles of African produce, for Britiſh manufactures. The total number of inhabitants of the colony at this time was about 1200.

In 1800 the company obtained a charter, creating their ſettlement an independent colony, and authorizing the directors to frame laws for its government, to appoint a governor and council, and to make other arrangements for the adminiſtration of juſtice; a ſmall military force was at the ſame time ſent for the defence of the colony. The ſum of 7000*l*. being part of the ſum granted by parliament for the maintenance of African forts, was paid to the company for the erection of a fort; 10,000 *l*. was about the ſame time received from government as a partial indemnification for the expence to which the company had been put in ſettling the Nova Scotians; 4000 *l*. was alſo granted for the ſupport of the civil government of the colony. About this time the company agreed to receive in their colony the Maroon Indians, and ſoon after their arrival, employed them to quell an inſurrection among the Nova Scotians, who had endeavoured to poſſeſs themſelves of the government. A more ſerious attack on the colony was afterward made by ſome of the native chiefs in the neighbourhood, which rendered it neceſſary to adopt additional means of defence.

The ſums ſince granted by parliament for defraying the charges of the civil eſtabliſhment of the company, and for the erection of fortifications, have been as follow:

For the year	1801	£ 4,000
	1802	10,000
	1803	14,000
	1804	14,000
	1805	14 000
	1806	18,000

The trade of the company appears to have been ſucceſsful, ſuppoſing it to have been burthened only with thoſe charges which are ſtrictly commercial, and to have been exempt from the extraordinary loſſes by fire, and the deſtruction of the ſettlement which it has had to ſuſtain. The abolition of the ſlave trade will remove ſome great obſtacles to the ſucceſs of this laudable undertaking, and probably enable it to improve and extend its commercial intercourſe with the natives very conſiderably.

Company, *for the Manufacture of Flour, Meal, and Bread.* During the diſtreſs occaſioned by the great ſcarcity of corn, in the year 1800, a number of perſons formed themſelves into a company, for the purpoſe of eſtabliſhing in London a manufactory of flour, meal, and bread, to be ſold out at reaſonable prices. They were incorporated by parliament, and empowered to ſubſcribe a joint capital, not exceeding 120,000 *l*. in ſhares of 25 *l*. each; their profits being limited to 10 per cent., and the ſurplus, if any, to be at the diſpoſal of parliament. They were limited to ſell only 120,000 ſacks of flour, or meal in a year, to make only 200 ſacks into bread in a week, and to ſell not more than 1000 quarters of wheat in any one week. The managers of the company were prohibited from dealing in corn, flour, or bread, for their own private account; and were required to lay before parliament an annual ſtatement of their receipts and payments, of the quantities of grain purchaſed, with the prices paid for the ſame, of the quantities of grain and flour in ſtore, of the quantities of flour and bread manufactured by the company, and of the debts and credits of the company, with the names of all the members of it, and the number of ſhares held by each. By theſe regulations ſufficient publicity is given to the concerns of the company to prevent it from ever being perverted from the original principle of the eſtabliſhment, and made ſubſervient to ſchemes of monopoly or ſpeculation; and though upon the ſcarcity ceaſing, they diſcontinued making bread, they have carried on the manufacture of flour and meal, and probably contributed to prevent theſe eſſential articles from being unneceſſarily enhanced in price.

The total quantity of wheat purchaſed by the company in the year 1806, was 9182 quarters, for which they paid 32,655*l.* 19*s.*; the quantity of flour manufactured was 10,536 ſacks. The number of proprietors of the company was 330.

The king by an order in council may diſſolve this company on ſix months previous notice being given.

Company, *Dock*. See Dock.

Company, *Dutch Eaſt-India*, had its riſe in the midſt of the ſtruggle which that people had for their liberty; for the Spaniards having forbid all commerce with them, and ſhut up all their ports, neceſſity inſpired ſome Zealanders to ſeek a new north-eaſt paſſage to China.

This enterprize proving unſucceſsful to three ſeveral armaments in 1594, 1595, and 1596, a ſecond company was formed under the name of the "Company of remote Parts;" which, in 1595, took the ordinary route of the Portugueſe to the Indies, and returned in two years and a half's time, with little gain, but good hopes.

This company, and a new one juſt eſtabliſhed at Amſterdam, being united, equipped other fleets; and theſe occaſioned other companies at Amſterdam, Rotterdam, in Zealand, &c, inſomuch that the ſtates ſoon began to apprehend they might be prejudicial to each other. Under this concern they called all the directors of the ſeveral companies together, who all conſented to the union, the treaty whereof was confirmed by the ſtates in 1602, a very remarkable epocha, as being that of the moſt ſolid and celebrated eſtabliſhment of commerce that ever was in the world.

At this time they obtained a charter from the ſtates; and prevailed upon that body, by adminiſtering to its exigencies in the Spaniſh war, to grant them the excluſive privilege of trading to the ſouthern parts of Africa, for a ſhort term of years. The company's capital of 6,500,000 florins (about 541,833 *l.* ſterling) was divided into transferable ſhares, or *actions*, as they are called on the continent, of 3000 florins (about 250 *l.* ſterling each), which were all ſpeedily bought up. The ſuperiority of their trading capital, together with their greater ſkill in commerce and navigation, enabled them to underſell all other nations, even in the foreign markets of Europe. As they alſo fixed the prices of their merchandize to all conſumers, their profits for ſome years were enormous. The annual dividends for the 6 years ending in 1610 were as high as 36 per cent.; and in a ſhort time, the actions roſe from 3000 to 15,000, and at one time ſtood as high as 24,000 florins, 8 times the amount of their prime coſt. The charter, firſt granted in 1602, and ſince renewed from time to time, conferred upon them, beſides the excluſive right of trading to the Eaſt, the ſovereignty (under the ſuperintendence of the ſtates-general) of all the territories which they might acquire in that part of the world, by purchaſe, treaty, or conqueſt, with the full power of appointing their own ſervants; of raiſing whatever force they might deem neceſſary for the defence of their territories; and of enacting laws for the internal adminiſtration of their dominions. In conſequence of this charter, the moſt extenſive that was ever granted to any trading corporation, the company proceeded to arrange their eſtabliſhment, both in Europe and the Eaſt Indies. Their affairs were under the management of ſixty directors, divided into ſeveral chambers; twenty in that of Amſterdam, twelve in that of Zealand, fourteen in that of Delft and Rotterdam, and a like number in thoſe at Sluys and Horn. As each grant expired the company was obliged to procure a new one, which it has already done, four times ſince the firſt; *viz.* one in 1623, for forty-one years, like the firſt; another for twenty-one years, commencing in 1643; and a third in 1665, for forty years; a fourth in advance, commencing in 1698, to end in 1740. Each grant coſt the company a conſiderable ſum; that of 1647 coſt 1,600,000 guilders, and the two following ones more; that of 1698 was confirmed by a placard of the ſtates-general, granted them an excluſive privilege, which was prolonged in 1761, for thirty years more. The average premium paid for theſe renewals was about 270,000 *l.* ſterling, or three millions of florins.

Their factories, reſidences, &c. in the Eaſt Indies, were very numerous; reaching from the Perſian gulf to the coaſt of China: the principal was that of Batavia, the centre of their commerce: here reſided the general, with the ſtate and ſplendor of a ſovereign prince; making war and peace with the eaſtern kings and emperors at pleaſure. They had alſo ſeveral other conſiderable factories on the coaſt of China, in Japan, Malacca, Surat, Amboyna, Banda, Siam, Moluccas, &c. ſeveral on the coaſt of Coromandel, and at Iſpahan, Cape of Good Hope, &c. in all, they numbered forty factories, and twenty-five fortreſſes. They engroſſed the whole trade of the ſpicery in their own hands.

At ſo early a period as the year 1616, this company had no leſs than 45 large veſſels engaged in war and trade, with 10,000 ſoldiers and ſailors in their ſervice, and 4,000 pieces of artillery. However, the flouriſhing ſtate of their affairs was of ſhort duration. The miſmanagement and plunder of the company's ſervants, and the diſputes in which their cruelties, avarice, and imprudence involved them with the native powers during the 17th century, and the diſſenſions which aroſe among the different chambers of the general direction at home, greatly reduced the trade, wealth, and power of the inſtitution. The expence of the military eſtabliſhment alſo increaſed; ſo that at the end of the 18th century, it amounted to 80 veſſels, carrying from 30 to 60 guns, and 25,000 men, ſoldiers included, while the whole dominions in Java, and its dependencies, were farmed for 361,260 dollars. The directors acknowledged that, in 1780, their loſs in the war had exceeded 10 millions of florins, nearly twice the amount of their original capital. In the 18th century the Oſtend Eaſt India company excited the jealouſy of the Dutch company. In 1721, a law was paſſed by the ſtates, prohibiting their ſubjects from ſailing under the Oſtend colours, upon pain of death: and in 1731, this unfortunate aſſociation was diſſolved in conſequence of repreſentations from the different European ſtates intereſted in the Eaſt Indian trade; among which Holland, that is the Dutch company, took the lead. Various precautions have been uſed to ſupport the credit of this company, ſome of which were oppreſſive to the country; nevertheleſs, its ſhares have continued to fall with augmented rapidity. In the period from 1605 to 1779, the dividends have varied from 75 to 10 per cent.; and in many years no dividend at all was iſſued. From 1605 to 1610 (both incluſive), the dividend was, at an average, 36 per cent. From 1610 to 1648, the average was only 21; and from 1771 to 1780, it was no more than 12½ per cent. The price of the actions, which had at firſt riſen to 500, and even 800 per cent. of the prime coſt, fell, in the period from 1770 to 1780, to about 340 per cent., and during that time continued regularly to fall. The laſt dividend this once flouriſhing company made to their proprietors was in the year 1796; but it was not paid till 1799, as their commerce, which had been rapidly declining for the laſt 30 years, was entirely ſuſpended.

Company, *Dutch Weſt India*, was eſtabliſhed in 1621, with an excluſive privilege to trade twenty-four years along the coaſts of Africa, between the tropic of Cancer and Cape of Good Hope; and in America, from the ſouth point of Newfoundland, through the ſtraits of Magellan, that of Le Maire, or others, to the ſtraits of Anian, both in the north and ſouth Sea.

Beſides theſe commercial privileges, the ſtates conferred upon the corporation the right of governing and defending any new colonies which it might acquire; and made it a preſent of ſeveral large veſſels, well manned. They retained to themſelves, however, the nomination of the company's governor-general abroad. The original capital of this aſſociation amounted to 72,000 florins, in transferable ſhares, or actions, of 6000 florins each.

The 74 directors were divided into five chambers (as in the Eaſt India company), out of which, eighteen, with a deputy appointed by the ſtates, were choſen for the general direction of affairs. In 1647, the company renewed its grant for twenty-five years; but it was ſcarce able to hold out the term, on account of its great loſſes and expences in taking the bay of Todos los Santos, Fernambuc, and the greateſt part of Braſil, from the Portugueſe. The weakneſs of this company, which had ſeveral times in vain attempted to be joined to that of the Eaſt Indies, occaſioned its diſſolution at the expiration of its grant.

In 1674, a new company, compoſed of the ancient proprietors and their creditors, was ſettled in the ſame rights and eſtabliſhment with the former. It was to undertake the burden of the old company's debt, amounting to ſix millions, but reduced to 30 per cent.; and was to accredit in its books the proprietors of the old company's ſtock, at the rate of 15 per cent. The creditors, on their part, were to advance an addition of 8 per cent. on their loans; and the ſtockholders were to advance 4 per cent. on their ſhares. The new capital, thus ſcraped together, amounted only to 630,000 florins. The excluſive commerce of the company was limited to a certain part of the African coaſt, beſides the conqueſts they ſhould make; and its principal eſtabliſhments were at Cape Verd, on the Gold Coaſt, at Tobago, Curaſſoa, &c. in America. The reſt of the trade monopolized by the former company was now thrown open to all the ſubjects of the republic. In 1730, when the charter was renewed, the African ſlave-trade was made free, on condition of a certain laſtage being paid to the company; and in 1734, the whole African trade was laid open upon the ſame terms. As the united privileges of the company were not ſufficient to counterbalance the various diſadvantages under which all freſh inſtitutions labour, they obtained, in 1682, the excluſive management of the colony of Surinam, for the trifling ſum of 260,000 florins paid to the ſtates-general. This grant was accompanied by certain conditions, framed with the manifeſt view of preventing the abuſes common to trading corporations. Under theſe reſtrictions, the company was not able to defray the expence of the original purchaſe-money paid for the charter; and, therefore, in the next year, one-third ſhare was ſold to the city of Amſterdam, and another to the rich family of Sommelſdyk, reſerving the remaining third to themſelves. Theſe three coproprietors have ſince continued to form a ſociety or partnerſhip, under the name of the "Surinam Company," regulated by the charter originally granted to the Weſt India company. Except in the government of Surinam, this aſſociation has had no connection with the Weſt India company, which, of courſe, continued to furniſh negroes to the ſettlement, in its capacity of African company, until the year 1730.

The progreſs of the dividends and prices of Weſt India ſtock will enable us to judge concerning the proſperity, not only of the Surinam ſociety, but alſo of the concerns of the Weſt India company. The average dividend in ten years, ending 1690, was $2\frac{2}{5}$ per cent.; and from 1773 to 1779 incluſive, nothing at all was divided. The actions have never been at par; their price has varied from $92\frac{1}{2}$ to 18 per cent. ſince the year 1723. The average price during ten years, ending 1732, was about $81\frac{1}{2}$ per cent. During ten years, ending 1779, it had fallen to $32\frac{4}{5}$ per cent. The ſettlements of Eſſequibo and Demerary have been always under the charter of the Weſt India company, as well as Surinam, and governed in the ſame manner. Berbice, though within the company's charter, owed its origin to the ſpeculations of the family of Van Peere; and all the cultivated part of the colony belonged to them. In 1678 they obtained a perpetual grant of it from the company, which was confirmed in 1703; and when the French attacked it in 1712, the colony bought them off with a conſiderable compoſition. The money was paid by their great mercantile houſes, and one fourth of it by the Van Feeres, who thus transferred three-fourth ſhares of the colony to the other merchants as co-proprietors; and the four houſes together formed a copartnery or company at Berbice, adminiſtered exactly in the ſame manner with the Surinam ſociety. The proprietary governments of North America differed from the company adminiſtrations of Guiana in many important particulars. They were the conſequence of large and thoughtleſs grants, made by the court to favourites, of waſte and uninhabited lands. As the Britiſh colonies were ſubſervient to the legiſlature of the mother-country, the Dutch colonies owed the ſame allegiance, not to the ſtates-general, but to the proprietors. The ill ſucceſs of the Weſt India company furniſhes an uſeful example of the manifold evils of company government. This company muſt of late have been annihilated by the capture of all their ſettlements.

Company, *Dutch North*, has no excluſive privilege; the advantage of its patent being of another kind, and very conſiderable.

There are alſo, in Holland, companies for the Baltic ſea, the fiſhery of Nova Zembla, Davis's Streights, and Greenland: yet none of their fiſheries are interdicted to private traders; all the difference between theſe and the companies conſiſting in this, that the former may not go aſhore to cut their fiſh in pieces, and melt their lard: but muſt bring their luggage to Holland.

Company, *Dutch Levant*. In ſtrictneſs, there is no Levant company in Holland: but the commerce of the private traders is ſo conſiderable, that the ſtate has taken the regulation thereof on itſelf.

To this end, they have eſtabliſhed a chamber of direction at Amſterdam, compoſed of ſix deputies, and a regiſter; who, under the burgomaſters, take care of every thing relating to the commerce of the Mediterranean; eſpecially that of Smyrna and Conſtantinople.

This company names the conſuls, appoints the number and ſtrength of convoys, terminates differences among the traders, and has alſo a right, on occaſion, to add new regulations to the old ones; though thoſe be of no force, till confirmed by the ſtates general.

Company, *French Eaſt India*, was eſtabliſhed in 1664, with an excluſive privilege to trade for fifty years in all the ſeas of the Eaſt Indies and South Sea; no adventurer to be admitted without a thouſand livres in ſtock; and foreigners, who have twenty thouſand livres in ſtock, to be reputed regnicoles.

The patent grants them the iſland of Madagaſcar; and the king to be at one fifth of the expence of the three firſt armaments, without intereſt; the principal to be refunded in ten years: or, if the company finds it loſes on the whole, the loſs to fall on the king's ſide.

The capital fund of the company, which was moſtly furniſhed by the king, was ſeven or eight millions of livres, but was to have been fifteen millions.

In effect, though no means were wanting to ſupport the company, yet it ſtill drooped, and ſtill ſtruggled; till, having ſubſiſted ten years without any change in its form, and being no longer able to diſcharge its engagements, there were new regulations concerted, but to little purpoſe. At length, things not being diſpoſed for a new Eaſt India company, nor much good to be expected from the old one, in 1708, the miniſtry allowed the directors to treat with the rich traders of St. Malo, and reſign to them their privilege under certain conditions. In the hands of theſe laſt, the company began to flouriſh.

Its chief factory was at Pondicherry, on the coaſt of Coromandel; this was the reſidence of the director-general; the other factories were inconſiderable. The merchandizes which the company brought into France were, ſilks, cottons, ſpices, coffee, rice, ſalt-petre; ſeveral kinds of gums and drugs, wood, wax, printed calicoes, muſlins, &c. The trade was laid open in 1769, which ſoon reduced the company to a ſet of mere holders of the government funds. A new company was eſtabliſhed in 1785 with the privilege of an extenſive trade to all parts of the Eaſt Indies, except the Iſle of France and its dependencies. This exception muſt have prevented the company from ſucceeding; but the experiment had ſcarcely been made when the trade was again laid open by the national aſſembly in 1790. As for the other French companies, ſuch has been the ſtate of the country, they are all, we preſume, extinct; and it is needleſs to give any account of them. Such were the *French Weſt India company*, eſtabliſhed in 1664, and poſſeſſing by their charter the property and ſeigniority of Canada, Acadia, the Antilles iſland, the iſle of Cayenne, and the Terra Firma of America, from the river of the Amazons to that of Oroonoko; with an excluſive privilege for the commerce of theſe places, as alſo of Senegal, and the coaſts of Guinea, for 40 years, on condition of paying half the duties; but in 1674 the grant was revoked, partly on account of the poverty of the company, and partly becauſe it had anſwered the purpoſe of its eſtabliſhment by recovering the commerce of the Weſt Indies from the Dutch:—the *French Miſſiſſippi company*, firſt eſtabliſhed in 1684, in favour of the chevalier de la Salle, who ſailed in ſearch of the Miſſiſſippi, but miſcarried with his colony, and came to an untimely death. He was ſucceeded by M. Hiberville. who found the Miſſiſſippi and ſettled a colony there; but this adventurer being poiſoned, M. Crozat obtained in 1712 the ſole privilege of trading to the French territories called Louiſiana, granted to him for 15 years:—*Company of the Weſt*, formed in 1717, when M. Crozat ſurrendered his grant before mentioned; and obtaining beſides every thing granted to the former company the commerce of beaver, enjoyed by the Canada company from the year 1706, but expiring in 1717:—*India company*, formed by a junction of the former company with that of Canada and with that of Senegal in 1718, and alſo by an union with the Eaſt India company, and with thoſe of China and St. Domingo, with the two firſt in 1719, and with the third in 1720;—the *Baſtion company*, ariſing from the aſſociation of two merchants of Marſeilles in the 15th century for fiſhing of coral in the gulf of Stora-Courcoury on the coaſt of Barbary, on the frontiers of Algiers and Tunis; ſo called from a ſmall fort called the "Baſtion of France;" built in 1561, but it ſunk in 1633;—and ſeveral other companies, which either fell of themſelves, or upon the expiration of their grants, and which it is therefore needleſs to mention.

Company, *Daniſh North*, was eſtabliſhed at Copenhagen in 1647. Its eſtabliſhments are very conſiderable in Norway; beſides which, it ſends veſſels to Waranger, whence they convey their merchandizes by land into the Daniſh Lapland; and by ſledges drawn by rein-deer into the Muſcovite Lapland. It alſo ſends others for Borandai and Siberia; where its agent takes them up, and conveys them, in like manner, on ſledges, to Panigorod, the capital of this part of the Muſcovite empire.

The commodities it ſends thither are rix-dollars, tobacco, and linens; it returns nothing but furs and ſkins.

Company, *Daniſh Iceland*, eſtabliſhed in the ſame year with the North Company, its chief factory is at Kirkebar, a large town in that iſland.

Company, *Daniſh Eaſt India*, eſtabliſhed in the year 1616, and inveſted not only with the excluſive privilege of trading to the Eaſt, but with the powers of civil and military adminiſtration; their chief factory was at Tranquebar. In 1634 this corporation was diſſolved, and another, with ſimilar privileges, ſubſtituted in its place. This alſo rapidly declined; and in 1686, a third inſtitution was tried for the ſame purpoſes; but this too failed in about 23 years; and the project was tried for the fourth time in 1732. The new company was provided with ample privileges and powers; and the poſſeſſion of theſe preſerved its exiſtence, and increaſed the profits of the ſtock-holder, at the expence of the country, and of the Indian ſettlements. In 1772 the charter expired, and was renewed under reſtrictions which proved ruinous to the proſperity of the company. In 1777, the king purchaſed the rights of the company, and the private trade began to flouriſh. When the charter was renewed in 1792 for 20 years, the private trade was rendered ſtill more free; all Daniſh ſubjects, and all foreigners were permitted to trade with the Indian ſettlements, upon receiving paſſports, either from Copenhagen or the Aſiatic ſeats of government, and upon condition of returning with the cargoes to Copenhagen.

Company, *Levant, of the Genoeſe*, eſtabliſhed in 1664, and confirmed by the Porte; notwithſtanding the oppoſition of the French. From 1670 this company has languiſhed and ſunk.

For a more particular account of the riſe and progreſs of moſt of the above mentioned and other companies, ſee "Anderſon's Hiſt. of Commerce."

Company, *New River*. This corporation conſiſts of a governor, deputy governor, treaſurer, and twenty-ſix directors, who hold a weekly board for appointing officers, granting leaſes, and redreſſing grievances. The projector of this canal for bringing water to London, with the aſſiſtance of king James I. and the corporation of London, is ſuppoſed to have expended 50,000*l.* upon it: the profits, which are divided into ſeventy-two ſhares, for the firſt thirty years admitted of little more than five pounds to each ſhare; but their value is much increaſed, and its original ſhares of 100*l.* are now eſtimated at upwards of twelve thouſand pounds each.

Company, in French *compagnie*. A certain number of people of war under the inſpection and command of a chief called captain. The number, however, is never fixed, but varies. In the guards, as in the artillery, a company conſiſts of 120 men. In the Auſtrian ſervice a company conſiſts of 200 men. A *compagnie d'ordonnance* was originally compoſed of fifteen companies of *gens d'armes* of a hundred *hommes d'armes* each. In former times the word *enſeigne* denoted the company of infantry, and the word *cornette* the company of cavalry. A company ſeldom conſiſts of fewer than 50 men. It generally has three or four ſerjeants, three or four corporals, and two drums.

Company, *Artillery*. See Artillery.

Company *of Muſicians*, in the city of Weſtminſter. See Charter.

Company, in *Sea Language*, denotes the whole crew of a ſhip, including her officers.

Company *of Ships*, is uſed for a fleet of merchant veſſels, who make a kind of charter-party among themſelves; whereby, under ſeveral clauſes and conditions tending to their common ſafety, they engage not to quit one another, but to defend each other reciprocally, during their voyage.

Theſe aſſociates, in the Mediterranean, are called conſerves. The chief conditions of the charter-party are, that ſuch and ſuch ſhall be owned admiral, vice admiral, and rear-admiral; and thoſe that bear no guns, ſhall pay ſo much per cent. of their cargo, for the expences of the admiral; that ſuch and ſuch ſignals ſhall be obſerved; that if they be attacked, the damages ſhall be reimburſed by the company in general, &c.

Company, *Rule of*, or *Fellowſhip*, in *Arithmetic*, is a rule whereby we diſcover or aſcertain the ſhare of the profits, or loſſes, belonging to the ſeveral partners, or aſſociates, in any enterprize, in proportion to the ſtock each contributed thereto, and the time that ſtock was in bank. See Fellowship.

COMPARATES, Comparata, in *Logic*, the terms or ſubjects of a compariſon; or the two things compared to each other.

COMPARATIONE—*Punctum ex* Comparatione. See Punctum.

COMPARATIONIS *Homogeneum*. See Homogeneum.

COMPARATIVE *Anatomy*. See Anatomy.

Comparative *Degree*, in *Grammar*, is an inflexion between poſitive and ſuperlative degrees; whoſe effect is, to ſet a thing above or beneath the level of another.

The Latins expreſſed their comparative degree by a particular termination of their adjectives, and particles; wherein they are followed by the Engliſh, though by few others of the modern languages.

The French form moſt of their comparatives by adding the particles *plus*, *moins*, and *auſſi;* the Italians, by *piu*, *meno*, &c. as the thing is to be raiſed, lowered, or equalled to another.

COMPARE, Val di, in *Geography*, an iſland in the Ionian ſea, anciently called Ithaca, noted for having been the country and kingdom of Ulyſſes.

COMPARISON, the relation of two perſons or things, conſidered as oppoſed, or ſet againſt each other, in order to find wherein they agree or differ; or wherein one has the advantage of the other.

Comparison *of Ideas*, an act of the mind, whereby it compares its ideas one with another, in reſpect of extent, degree, time, place, or any other circumſtances. This operation of the mind is the ground of relations.

Brutes ſeem not to have this faculty in any great degree: they have, probably, ſeveral ideas diſtinct enough; but cannot compare them farther than as to ſome ſenſible circumſtances annexed to the objects themſelves: the power of comparing general ideas, which we obſerve in men, they have not, as we may probably conjecture.

Comparison, in *Rhetoric*, is a figure, or rather place, in ſpeech, whereby two things are conſidered with regard to ſome third, which is common to them both.

Thus, Cicer. Topic. "Catoni licuit ſequi bellum civile, igitur et Ciceroni licebit." "It was allowed Cato to engage in the civil wars, therefore it may be allowed Cicero:" where, to engage in the civil wars is common to both.

There are three kinds of compariſon; the firſt *a majori*, *i. e.* from the major to the minor; as that of Cicero againſt Anthony, "Quid feceris domi tuæ, cum alienæ tam ſis inſolens?" Or that of Terence, "Quem feret, ſi parentem non fert ſuum?" From the ſame place, Ovid endeavours to appeaſe Cæſar.

> "Cur ego poſſe negem leniri Cæſaris iram
> Cum videam mites hoſtibus eſſe Deos?"

The ſecond, *à minori*, *i. e.* from the minor to the major: thus Cicero, "Majoris noſtri ſæpe mercatoribus, ac naviculatoribus injurioſius tractatis, bella geſſerunt; vos tot civium Romanorum millibus uno nuntio atque uno tempore necatis, quo tandem animo eſſe debetis?"

The third *à pari;* as when we contend, that what obtains in one thing, ought to obtain in another of the ſame kind: "It was a law that he who killed his father ſhould be ſewed up in a ſack, and thrown into a river; therefore, he who killeth his mother deſerves the ſame puniſhment."

> "Capto tuam, pudet heu, ſed capto, Maxime, cænam:
> Tu capis alterius; jam ſumus ergo pares.
> Mane ſalutatum venio, tu diceris eſſe,
> Ante ſalutatum: jam ſumus ergo pares," &c.
> Mart. lib. ii.

COMPARTIMENT, or Compartment, a deſign compoſed of ſeveral different figures, diſpoſed with ſymmetry, to adorn a parterre, a cieling, pannel of joinery, or the like.

The term of compartiment is alſo uſed in painting. The Turkiſh and Mooriſh paintings are only compartiments; the fine bindings of books are in compartiments, &c.

COMPARTITION, in *Architecture*, the uſeful and graceful diſtribution of the whole ground plot of an edifice, into rooms of office, and of reception, or entertainment. Compartition makes one of the great diviſions of the art of building.

COMPARTMENTS, in *Gardening*, are beds, plats, borders, and walks, laid out according to the form of the ground, and depend more on a good fancy, than on any ſet of rules, for their conſtruction. They are alſo ſometimes merely diverſities or knots of flower-gardens or parterres, of which there is an infinite variety, according to the fancy of the deſigner. Plain compartments are pieces of ground divided into equal ſquares and flower-beds, marked out by lines, and made of regularly equal length and breadth. Some allow to theſe ſquares borders of two feet broad, if the plot of ground be ſmall, and if larger of three feet, and edge the borders with box, or with upright hardy thyme; the alleys up between are to be laid with ſand or gravel, and kept clean weeded.

Compartment *of tiles*, is an arrangement of white and red tiles varniſhed, for the decoration of the covering of a roof.

Compartment, *alley of*. See Alley.

Compartment, in *Heraldry*, is the term for a partition in coat armour, when the arms of ſeveral families are borne by one, either on account of intermarriages or otherwiſe.

COMPASS, the *Mariner's* or *Nautical*. A period of about 500 years is now elapſed, ſince an admirable property of a natural production was either diſcovered by, or introduced amongſt, the nations of Europe. To the ſimple application of this remarkable property, mankind is indebted principally for the diſcovery of a new continent nearly equal to the old one, for an extenſive commerce between the moſt diſtant nations, and for an accurate knowledge of the ſhape and ſize of the world we inhabit. The *magnet* or *loadſtone* is the natural production, and its directive property forms the active part of that wonderful guide, the *mariner's compaſs*, or as it is more commonly called, ſimply the *compaſs*, probably from its moving in a circle, or from its compaſſing the whole horizon. Whatever relates to the hiſtory, the conſtruction, the uſe, and the defects, of this ſingular machine, is rendered extremely important by the curioſity, the intereſts, the ſecurity, and the wants of the human ſpecies.

The time when the attractive property of the magnet was firſt diſcovered, is by no means known. The opinions are various, but they are not eſtabliſhed upon hiſtorical documents of ſufficient accuracy and authenticity. Certain however it is, that mankind was acquainted with it at a very early period. Father Kircher, in his work, *De Magnete*, l. i. cap. v., endeavours to prove that the Hebrews were acquainted with the magnet's ſingular property of attracting iron; and from Plutarch it appears, that the Egyptians were not ignorant of it. Pythagoras, Ptolemy, Hippocrates, Empedocles, Democritus, Leucippus, Epicurus, and ſeveral other ancient philoſophers, knew and admired this wonderful property of the magnet. Thales and Anaxagoras were ſo ſtruck with it, as to imagine that the magnet had a ſoul; and Plato ſaid that the cauſe of its attraction was divine. Ariſtotle, Theophraſtus, Dioſcorides, Galen, and others, were likewiſe acquainted with this property of the magnet. But its directive property (*viz.* that property by which, if placed upon a piece of cork, or wood, &c. to ſwim on the ſurface of water, or if it be ſuſpended by a very flexible thread, ſo as to have ſufficient freedom of motion, it will conſtantly place itſelf in a certain ſituation with reſpect to the cardinal points of the world) does not appear to have been known to the ancients; and though the time of the diſcovery of this property is of a much more recent date, yet this too is involved in much doubt and obſcurity. It ſeems, however, that the uſe of this property, or (what amounts to the ſame thing) the uſe of the magnetic needle, was not known in Europe before the thirteenth century. The honour of its diſcovery has been much conteſted. The Spaniſh Jeſuit Pineda, and Kircher, affirm that Solomon knew the uſe of the compaſs, and that his ſubjects actually uſed it in their navigations. Plautus *in Mercatore*, act v. ſcene ii., has the following remarkable paſſage, *Huc ſecundus ventus eſt, cape modo vorſoriam.* Now ſome authors are of opinion, that by the word *vorſoriam* or *verſoriam*, is meant the mariner's compaſs; but ſome learned critics affirm that *verſoriam* or *verſorium*, meant a particular rope. And Dr. Lorimer is inclined to believe that it only meant the helm.

By the conſent of moſt writers, it ſeems that a certain Flavio, or John, de Gioja, or Giova, or Gira, a Neapolitan, who lived in the 13th century, has the beſt title to the diſcovery. Flavius Blond affirms that about the year 1302, the above-mentioned John de Gioja, a noble citizen of Amalphi, a town of Principato, in the kingdom of Naples, firſt diſcovered the mariner's compaſs; and he quotes the following verſe from Antony of Palermo, recorded by the Neapolitan hiſtorians, *viz.*

Primo dedit nautis uſum magnetis Amalphi.

The arms of the territory of Principato have, it appears, ever ſince been a mariner's compaſs. See *Collinas, et Frombellus de acus magneticæ inventore.* Inſt. Acad. Bonon. tom. ii. p. 3. p. 372.

Dr. Gilbert, an Engliſh writer of the 16th century, in his book *De Magnete*, affirms that Paulus Venetus (the Venetian Marco Paulo) brought the invention of the compaſs to Italy in the year 1260; having learned it of the Chineſe. But this cannot be true; for Marco Paulo did not ſet out for China before the year 1269, nor did he return before the year 1295 (ſee Purchas's Pilgrim, vol. iii.); whereas the directive property of the magnet, and the communication of that property to ſteel, was known in Europe before that time; though in all probability it was not uſed in navigation till ſome time after, which may very reaſonably be attributed to the clumſy mode of ſuſpending the magnetic needle, which muſt at firſt have been practiſed. Ludi Vertomannus aſſerts, that when he was in the Eaſt Indies, about the year 1500, he ſaw a pilot direct his courſe by a magnetic needle, faſtened and formed like thoſe now in uſe. And Mr. Barlow, in his Navigator's Supply, anno 1597, relates, that in a perſonal conference with two Eaſt Indians, they affirmed that, inſtead of our compaſs, they uſed a magnetic needle of about ſix inches in length, ſuſpended upon a pin in a diſh of white China earth filled with water, in the bottom of which there were marked two croſs lines to indicate the principal winds; the reſt of the diviſions being left to the ſkill of their pilots. But theſe two laſt obſervations, being of a date much poſterior to the uſe of the magnetic needle in Europe, conclude nothing with reſpect to its original diſcovery; ſince the uſe of that magnetic property might have been introduced into Aſia by ſome European.

P. Duhalde, in his "General Hiſtory of China," vol. i. in the annals of the Chineſe monarchy, ſpeaking of the emperor *Hoangti*, when he gave battle to *Tchi Yeou*, ſays, "He perceiving that thick fogs ſaved the enemy from his purſuit, and that the ſoldiers rambled out of the way, and loſt the courſe of the wind, made a carr, which ſhewed them the four cardinal points. By this method he overtook *Tchi Yeou*, made him priſoner, and put him to death. Some ſay there were engraven in this carr, on a plate, the characters of a rat and a horſe, and underneath was placed a needle to determine the four parts of the world. This would amount to the uſe of the compaſs, or ſomething very near it, being of great antiquity and well atteſted." And in another part of the ſame book, ſpeaking of certain ambaſſadors, he ſays, "After they had their audience of leave in order to return to their own country, *Tcheou Kong* gave them an inſtrument, which on one ſide pointed towards the north, and on the oppoſite ſide towards the ſouth, to direct them better on their way home, than they had been directed in coming to China. This inſtrument was called *Tchi Nan*, which is the ſame name as the Chineſe now call the ſea-compaſs by: this has given occaſion to think that *Tcheou Kong* was the inventor of the compaſs." This happened in the 22d cycle, above 1040 before Chriſt. Renaudot adduces ſtrong reaſons againſt the knowledge of the mariner's compaſs amongſt the ancient people of China, and of Arabia. See Kircher, *De Magnete, lib.* i. *cap.* v.

In the works of Claude Fauchet, entitled, *Recueil de l'origine de la Langue et Poeſie Francois, fol.* 555, there is a quotation from an old French poem, called *la Bible Guiot*, in which the mariner's compaſs is evidently mentioned. This ſame paſſage is likewiſe quoted by Muſchenbroeck, in his *Diſſertatio de Magnete*. The paſſage in which the compaſs is mentioned forms part of the abovementioned poem, contained in a curious quarto manuſcript of the 13th century, on vellum, belonging to the royal library at Paris, which was never publiſhed. The poem entitled *la Bible Guiot*,

Guiot, forms the firſt article of the volume; the author of which. *viz. Guiot de Provins*, as mentioned in the poem itſelf, was at the court of the emperor Frederic Barbaroſſa, held at Mentz in the year 1181, when the emperor's two ſons were knighted. See Chron. Abbot. Uſperg. p. 311.

Here follows this remarkable paſſage in its antiquated language, to which is ſubjoined a literal tranſlation made by a native of Provence.

Extract from la Bible Guiot.

Icelle eſtoile ne ſe muet,
Une arts ſont qui mentir ne puet,
Par la virtu de la manete
Une piere laide et brunete,
Ou il fers volenters ſe joint.
Ont regardent lor droit point
Puez c'une aguile lont touchie,
Et en un feſtu lont fiſhie,
En longue la mette ſens plus,
Et il feſtui la tient deſus;
Puis ſe torne la point toute
Contre leſtoile ſans doute,
Quant il nuis eſt tenebre et brune
Con ne voit eſtoile ne lune,
Lor font a laguille alumer;
Puiz ne puent ils aſſorer,
Contre leſtoile vers le pointe;
Par ce ſont il mariner cointe,
De la droite voie tenir;
C'eſt uns ars qui ne puet mentir.

Literal Tranſlation of the preceding.

This ſame (the pole) ſtar does not move, (and)
They (the mariners) have an art which cannot deceive,
By the virtue of the magnet
An ugly browniſh ſtone
To which iron adheres of its own accord.
Then they look for the right point,
And when they have touched a needle (on it)
And fixed it on a bit of ſtraw
Lengthwiſe in the middle, without more,
And the ſtraw keeps it above;
Then the point turns juſt
Againſt the ſtar undoubtedly,
When the night is dark and gloomy,
That you can ſee neither ſtar nor moon,
Then they bring a light to the needle;
Can they not then aſſure themſelves
Of the ſituation of the ſtar towards the point (of the needle?)
By this the mariner is enabled
To keep the proper courſe;
This an art which cannot deceive.

Francis Cabeus, a jeſuit of Ferrara, ſays, that the firſt thing he knows profeſſedly written reſpecting the directive property of the magnet, was an epiſtle of *Petrus Peregrinus Gallus*, about the latter end of the 13th century. A few years after, this epiſtle was diſguiſed by one John Taſnier, who publiſhed it in his own name, under the title of *Opuſculum perpetua memoria digniſſimum de natura et effectibus magnetis.* Some years ago, Mr. Senebier of Geneva ſent the following memorandum concerning this letter to Dr. Lorimer in London.

"*Epiſtola Petri Peregrini de Marcourt,*
Ad Sigerium de Foueancourt, Militem.
De Magnete."

"The work contains a deſcription of that ſtone, the means of finding the poles, its property of attracting iron, and proves that the part of the magnet which is turned to the north, attracts that which is turned to the ſouth. It then teaches the manner of employing the magnet in aſtronomy, and of playing tricks like thoſe of Comus. It deſerves to be remarked, that the author knew not that the magnet could be employed in navigation; for though he frequently ſpeaks *de ſtella nautica*, he never ſpeaks of the uſe that might be made of the magnetic needle in ſea voyages. *Vide Bibliotheca Bibliothecarum, fol.* 11. p. 1400. Catalogue of the manuſcripts in the library of Geneva, by Senebier, p. 207."

Amongſt the manuſcripts of the univerſity of Leyden, there is a volume containing ſeveral ſcientific tracts, one of which is a Latin letter of Peter Adſiger, on the properties of the magnet. It is, in fact, a little methodical treatiſe, divided into two parts, the firſt of which is ſubdivided into ten, and the ſecond into three chapters. This letter, which ſeems intended for the inſtruction of ſome particular friend, is dated in the year 1269. A few years ago, Mr. Cavallo obtained an exact copy of this curious letter, of which he inſerted very ample extracts, both in the original Latin and in Engliſh, in the ſupplement to the ſecond and third editions of his treatiſe on magnetiſm, from which it appears that the writer, at that early time, was acquainted with all the principal properties of the magnet. The following is the tranſlation of the moſt remarkable part of the abovementioned letter, which deſcribes the compaſs, and mentions the declination of the magnetic needle.

"Part II. Chap. 2. *On the conſtruction of a better inſtrument to anſwer the ſame purpoſe*, viz. *to find out the Azimuth of the Sun, the Moon, or any Star upon the Horizon.*

"In the preſent chapter, you will be informed of the conſtruction of another inſtrument of more certain effect: A veſſel muſt be made of wood, copper, or any other material, and let it be turned like a box of ſmall depth, and competently wide. Let a cover of ſome tranſparent ſubſtance, as glaſs or cryſtal, be adapted to it; and if the whole were made of ſome tranſparent matter, it would be ſtill better. A ſlender axis of copper or ſilver muſt be adapted to the middle of this veſſel, applying its extremities to the upper and lower parts of the box, *viz.* to the cover and to the box; the axis, however, muſt not be ſo firmly faſtened, as not to be capable of moving very freely. Two holes muſt be perforated in the middle of the axis, at right angles to each other, and an iron ſtyle, like a needle, muſt paſs through one of thoſe holes, whilſt another ſtyle of ſilver or copper paſſes through the other hole in a direction croſſing the iron one. The cover muſt firſt be divided into four parts, and each of theſe into ninety parts, agreeably to the inſtructions given concerning the other inſtrument in the preceding chapter, and upon it mark the north and the ſouth, the eaſt and the weſt, points; and let a ruler of ſome tranſparent ſubſtance, with ſights on its extremities, be adapted to it. Then place whichever part of the magnet you pleaſe, *viz.* the north or the ſouth, near the glaſs, until the needle be moved towards the ſaid magnet, and acquires the virtue from it; after which, the magnet being removed, the extremity of the needle will turn itſelf towards the pole. This being done, turn the box until one extremity of the needle remains directed towards the north part of the inſtrument, or the north part of the heaven; then turn the ruler towards the ſun in the day time, and towards the ſtars in the night time, after the manner mentioned in the preceding chapter. By means of this inſtrument, you may direct your courſe towards cities, and iſlands, and all other parts of the world, either on land or at ſea, provided you are acquainted with the longitudes and latitudes of thoſe places; for, if the town or iſland to which I intend to go is in a lower latitude than the place in which I am, I ſhall go ſtraight before me, towards that end of the ruler which is directed to the ſun or ſtar; but if the latitude of the place be greater, I ſhall proceed in the oppoſite way, *viz.* in the direction of the other extremity of the ruler. Obſerve, that the ſouth part of the needle, which is to be uſed as a guide, muſt be made to decline towards the weſt by one point; and this muſt be done by the declination of the north part towards the eaſt, becauſe the ſouth part of the inſtrument is deſtitute of diviſions."

"Take notice that the magnet, as well as the needle that has been touched by it, does not point exactly to the poles, but that part of it which is reckoned to point to the ſouth, declines a little to the weſt; and that part which looks towards the north, inclines as much to the eaſt. The exact quantity of this declination I have found, after numerous experiments, to be five degrees. However, this declination is no obſtacle to our guidance, becauſe we make the needle itſelf decline from the true ſouth by nearly one point and a half towards the weſt."

To this letter, Mr. Cavallo, in his treatiſe, ſubjoins the following obſervation. "It appears that the ſuſpenſion of the needle in the above deſcription, is a very clumſy one; and that the beautiful ſuſpenſion by a cap upon a pin, which is now univerſally uſed, was unknown to the author. It is likely, therefore, that for want of this ſuſpenſion, the needles at that time not moving ſufficiently eaſy, were not actually uſed in navigation, at leaſt in Europe, though the ſuſpenſion by means of a cap upon a pin, ſeems not to have remained long unknown after the date of this letter."

Sir G. Wheeler ſays, that he had ſeen a book of aſtronomy older than the year 1302, which mentions the uſe of the needle in aſtronomy, but not in navigation.

Gaſſendus adduces, as an argument of the French having been the inventors of the mariner's compaſs, that the north point of it is always marked with a flower-de-luce. Lib. x. Diog. Laert. t. I. p. 139. As for Goropius's pretence, that the compaſs muſt have been invented by the Danes, Dutch, or Germans, becauſe the 32 points on it are written and pronounced in the Dutch, or Teutonic language, it is hardly deſerving of a reply. Dr. Wallis attributes it to the Engliſh, for no other reaſon, but for its being called compaſs. Vincentius Bellaucenſis, and Albertus Magnus, who lived about the year 1245, alſo Lavinius Lemniſis, make mention of the direction of the poles of the magnet, as from a tract *de Lapidibus*, which had been attributed to Ariſtotle; but is, with more probability, ſuppoſed to have been written by ſome Arabian author, not long before their own time. This tract has been ſince loſt.

Notwithſtanding the foregoing remarks, it is ſtill very doubtful whether the uſe of the compaſs in navigation, or even the directive property of the magnet, was known by any people before the Europeans, in or about the 13th century; and it appears, that in the ſame century, or ſoon after, the above-mentioned Neapolitan, Flavio, or John de Gioja, if not the original diſcoverer, was at leaſt the firſt who uſed the mariner's compaſs, or conſtructed it for the uſe of veſſels in the Mediterranean.

The principle of the conſtruction of the compaſs is extremely ſimple. A magnet, or a piece of ſteel that has been rendered magnetical by means of natural or artificial magnets, muſt be freely ſuſpended, ſo as to be able to move without obſtruction; for ſuch magnet or piece of ſteel will, in that caſe, direct itſelf to certain parts of the world, which will of courſe indicate to the obſerver the direction of any other place, provided its ſituation on the ſurface of the earth be known. Suppoſe, for inſtance, that you are at ſea near Portſmouth, and wiſh to go towards Newfoundland, which lies to the weſt. By looking at the magnetic piece of ſteel or magnet, one extremity of which looks nearly towards the north, and turning your face to that part of the world, you proceed towards your left hand, at right angles to the direction of the needle; fot in that direction Newfoundland is to be found. And after the ſame manner, you may proceed in any other direction. Such is the ſimplicity of the principle; but the practical application of it, eſpecially in the preſent accurate mode of conſtructing inſtruments, and of making obſervations, requires a great degree of mechanical nicety, and a conſiderable degree of attention to a variety of circumſtances, upon which the accuracy of the inſtrument, and its various applications, abſolutely depend. On account of thoſe particulars, and in conſequence of various contrivances made at different times, the compaſs or magnetic needle has undergone innumerable alterations, both in ſhape and ſize; and every kind of conſtruction is attended with peculiar advantages, as well as defects; the moſt eſſential of which we ſhall endeavour to point out in the ſequel. From its various uſes, the compaſs has obtained different names and different forms. Theſe are reducible to the four following ſpecies, *viz.* 1. The *land compaſs*, which is uſed either for the pocket, or is adapted to theodolites, to celeſtial and terreſtrial globes, &c.; 2. The *ſteering compaſs* for the uſe of veſſels at ſea. 3. The *azimuth compaſs*, which ſerves to find the ſun's or ſtar's azimuth, whence the actual or true direction of the magnetic needle may be aſcertained (this ſeldom being due north and ſouth); and, 4. The *variation compaſs*, which, being ſituated in a proper place on land, ſhews the daily variation of the magnetic needle from its ordinary direction. See MAGNETICAL *Declination*, and MAGNETICAL *Variation*.

A common ſewing needle rendered magnetical, and ſimply laid upon water, or faſtened to a cork, or ſtraw, &c. and ſo laid upon water, in a glaſs, or earthen or wooden cup; or elſe ſuſpended by a very flexible thread, which muſt be faſtened to its middle, forms a ſimple but imperfect compaſs; and ſuch, in all probability, was one of the firſt modes of conſtructing the compaſs, whence the magnetized ſteel, wire, or bar, has, ever ſince, been called the magnetic needle. The defects of the laſt-mentioned conſtruction are too evident to need any particular remarks. The needle laid upon water is continually running to the ſides of the cup, the water is liable to be ſpilt, or if a thread be uſed, the ſtiffneſs of it will always influence the action of the needle. To avoid theſe inconveniences, an excellent contrivance was ſubſtituted. It is a conical cavity made in the middle of the needle or ſteel bar, as ſhewn in *Plate, Magnetiſm, fig.* 1. the open of which reſts upon a pointed wire *a*, which enables the needle to move with the greateſt freedom imaginable. The open of this cavity ſhould come as near as poſſible to the upper ſurface of the needle, or rather a little above it, as in *fig.* 2. in which caſe the upper ſurface of the middle part of the needle is left a little more elevated than the reſt. But in order to avoid any irregularity in the ſhape of the needle, as well as any difficulty in the mechanical formation, the needles are moſtly pierced quite through, with a pretty large hole; a piece of hammered braſs is rivetted into this hole, and the conical cavity is made into the braſs, ſo that the open of it may ſtand even with, or very little above, the upper ſurface of the needle. The upper part of the wire upon which the needle reſts, is generally made of hard ſteel, whilſt the lower part is made of braſs. This conſtruction anſwers very well for a conſiderable length of time; yet, by continual rubbing, a ſmall prolongation or irregularity of the cavity, is at length produced, which will in ſome degree obſtruct the free motion of the needle; hence, in the beſt needles, the upper part of the above-mentioned cavity is formed in a piece of agate, which is not in the braſs piece, as ſhewn in *fig.* 3. where AB is the needle, *c d* the braſs piece rivetted in a hole in the middle of it, and *e* is the piece of agate. The needles thus conſtructed are ſaid to have an agate cap. The defect to which thoſe agate caps are ſubject, is, that on account of the hardneſs of the ſtone, the cavity in it ſeldom runs to a point; the conſequence of which is, that the pin which ſupports the needle is apt to ſhift from one part of the agate cap to another, and of courſe the centre of the needle cannot always coincide with the point of ſuſpenſion.

The forms of the needles have likewiſe been very numerous. Some are ſlender and long, others broad and ſhort; ſeveral needles of the common ſort are made broad towards the end, but tapering towards the middle, or they terminate in two very ſharp points. Sometimes that extremity of the needle, which points towards the north, is formed like a croſs; but the moſt objectionable of all, are thoſe which conſiſt of two wires, and may be frequently met with on board of merchant ſhips. Two pieces of ſteel wire, each bent in the middle ſo as to form an obtuſe angle, and when fixed under the card, in the centre of which a braſs cap is faſtened, form a lozenge. All thoſe ſhapes may, in great meaſure, anſwer for common purpoſes; but they are far from being accurate or regular in their performance, the reaſon of which is, that a piece of ſteel of irregular form generally has more than two magnetic poles; almoſt every corner or protuberance being a ſouth or north magnetic pole; in conſequence of which the axis of the needle never coincides with its magnetic axis, the latter of which changes its ſituation in proportion as ſome of the above-mentioned poles become ſtronger or weaker than the reſt; and this is continually the caſe.

In order to avoid every irregularity of ſhape, and even the perforation, needles, for certain purpoſes, have been ſuſpended in the following manner: A B (*fig.* 4.) is the magnetic needle of a parallelopipedal form, which is faſtened to a piece of braſs C E D. In the middle of this piece of braſs at *g*, there is a ſmall conical cavity, wherein an agate cap is ſet. In order to ſuſpend this needle, a bar F H (*fig.* 5.) of braſs, or copper, or wood, is made faſt to the box K L.; in the middle of this bar a ſhort pointed wire is fixed, which, when the bar is made to paſs through the braſs piece C E D of *fig.* 4. *viz.* through *g*, enters the agate cap, and ſupports the needle. *Fig.* 5. repreſents the whole together, where F H is the bar faſtened to the box, A I B is the braſs piece, ſeen lengthways, or in the direction of the needle, which paſſes through the hole A B, and moves below the bar F H. It is evident that in this conſtruction the needle cannot turn quite round, conſequently this ſort of ſuſpenſion is not uſeful for navigation.

The Chineſe method of ſuſpending the magnetic needle is exceedingly ingenious (ſee *fig.* 6 and 7.), the firſt of which repreſents a ſection of this ſuſpenſion as viewed in the direction of the needle; and the ſecond exhibits a lateral view of the ſame. The letters refer to the ſame parts in both figures. I is a braſs cap very thin and light, and towards the edge of it there are two holes, oppoſite to each other. B B is a very ſlender ſlip of braſs, the upper part of which A, is ſhaped like a ring, through which the needle C D paſſes. The extremities of this ſlip of braſs go through the holes in the lower part of the cap, and are faſtened to it by being turned over its edge. The magnetic needle C D conſiſts of a cylindrical ſteel wire about an inch long, and not above a fortieth part of an inch in diameter; having its northern extremity only painted red by way of diſtinction. All this is ſupported by the pin E, which is faſtened to the bottom of the box, and upon which it moves very freely. In this conſtruction the needle is above the point of ſuſpenſion; yet the centre of gravity of all the three pieces (*viz.* cap, needle, and ſlip of braſs) taken together, is below the point of ſuſpenſion, which prevents the cap, &c. falling off from the pin when the compaſs is fixed in an horizontal poſition; but to prevent the cap with the needle being ſhook off by any ſudden jerks, or by inverting the inſtrument, there is a very thin braſs plate fixed to the box, a ſection of which is indicated by F G. It has a hole through the middle, which, being ſmaller than the diameter of the aperture of the braſs cap, prevents its falling off. It appears, from a variety of experiments, that the perforation through the magnetic needle is not attended with any bad conſequences. The external ſhape of the needle requires to be formed with greater attention, this being more apt to produce a multiplicity of poles. A very broad needle ſeldom has its magnetic axis coinciding with the axis of its figure. A very ſlender and long needle almoſt always has more than two magnetic poles. There is a certain breadth, proportionate to the length of a needle, which is leſs ſubject to an irregular diſpoſition of the magnetical virtue; this proportion, however, cannot be accurately determined. The little ſwelling generally left about the middle of the magnetic needles in order to give them ſtrength, where the perforation for the cap would otherwiſe weaken them, has not been found to produce multiplicity of poles, provided it be made ſmooth and free from corners. The lengths of the needles commonly uſed at ſea are from three to ſix inches, but thoſe that are uſed as variation needles are generally made longer, though they need not, however, exceed eight or at moſt nine inches. With reſpect to the ſubſtance of the needle, it muſt be obſerved that certain kinds of ſteel are more apt to acquire the magnetic virtue than others; but this muſt be determined by actual trial. The common ſort of magnetic needles are brought down to what is called by the workmen a blue temper, becauſe in that ſtate they are eaſily magnetized; but it muſt be obſerved that if in that ſtate they are eaſily magnetized, they are at the ſame time liable to loſe that power very eaſily; therefore the magnetic needles ought to be made quite hard; for in that caſe when they are once rendered magnetic, which is eaſily done, they will retain that power almoſt for ever after. The magnetic needles, though perfectly balanced before they are magnetized, will, after that operation, incline one of their extremities towards the horizon, which is in conſequence of the dipping property of the magnet. See MAGNETISM, and DIPPING *Needle*. Therefore after the communication of the magnetiſm, it becomes neceſſary to balance the needle again; but this muſt not be done either by grinding off part of that extremity of the needle, or by adding a fixed weight to the oppoſite extremity of it, becauſe the quantity of that dipping varies according to the change of ſituation on the ſurface of the earth. The beſt way of adding this weight is by placing a ſmall piece of braſs on one arm of the needle, capable of being ſlid nearer to, or farther from, the centre of the needle, by which means the balance of the needle when loſt may be eaſily reſtored. Upon all theſe conſiderations, a needle of the beſt form and ſize is exhibited at *fig.* 8. and 9.; the former of which repreſents a vertical, and the latter a lateral, view of it. A D is the needle of hard ſteel, C is the agate cap ſet in a piece of braſs, B a mark made on that extremity which points towards the north, in order to diſtinguiſh it from the other, and E is the piece of braſs which may be ſlid upon the arm C D, for the purpoſe of balancing the needle.

The ſhapes and ſizes of the compaſſes uſed upon land are very numerous; ſome being of the uſual ſize of a watch ſeal, and they are actually fixed in ſuch ſeals; others are of the ſize, and externally in the form of a pocket watch; others again are made in a wooden box, ſquare on the outſide, but circular within; ſome are of a larger ſize, in a braſs box. Sometimes a little ſun-dial is affixed to ſome compaſs boxes, and ſo forth. But though the ſhape be different, the principle of the conſtruction is the ſame in them all. The box, whether of wood, or braſs, or ſilver, or other ſubſtance, muſt have no particle of iron or ſteel in its conſtruction; and even the braſs, when that metallic ſubſtance is uſed, muſt be tried by preſenting the extremity of a very delicate magnetic needle to every part of it; for if any attraction be obſerved, that braſs muſt be rejected, otherwiſe the needle would not move with ſufficient freedom. Braſs is frequently magnetical, eſpecially after being hammered, which is generally done by the workmen, for the purpoſe of rendering it hard. A pin of hard ſteel is fixed in the centre of the box, upon the point of which the needle reſts; and a glaſs plate covers the cavity. This glaſs plate reſts upon a ſhoulder, and ſtands very little above the piece C (*fig.* 9.), ſo as not to touch that piece, whilſt at the ſame time it prevents the needle's falling from over the pin. In ſeveral of the compaſſes a little piece of wire with a button is affixed to the box, which is formed ſo as to ſtop the motion of the needle when the compaſs is not intended to be in action, as when it is carried in the pocket, &c.

The friction which muſt naturally take place in cleaning the glaſs cover of a compaſs, frequently excites its electricity, in which caſe the needle is attracted more or leſs by the glaſs, and its free motion is thereby partly or entirely obſtructed, Phil. Tranſ. N°. 480. p. 243. This inconvenience may be removed by paſſing a wet finger in various directions over the ſurface of the glaſs. Few needles of land compaſſes are furniſhed with cards like thoſe which are uſed at ſea. In general the principal points of the horizon are marked in the bottom of the box, and a divided circle is added to the box, ſo that the edge of it may be even with, and ſo near as almoſt to touch, the extremities of the needle.

The compaſſes uſed at ſea for aſcertaining and directing the courſe of veſſels, differ from the former principally by their having a circular card, whoſe diameter is equal to the length of the needle, fixed upon the needle, ſo as to turn with it, and by the box being ſet in a mechaniſm on four croſs centres, called gimbals, the office of which is to keep the compaſs box always in an horizontal poſition, whilſt the external box moves with the ſhip, as the latter rolls and pitches. This conſtruction will be eaſily underſtood, by obſerving *fig.* 10, which exhibits a ſteering compaſs as viewed by an eye placed perpendicularly over it. A B C D is the external wooden box, which is faſtened to and moves with the ſhip, E F is a braſs circle having two pivots or axes, G, H, which turn in two holes in the oppoſite ſides of the wooden box; *i o*, in the compaſs box, which is likewiſe furniſhed with two pivots or axes, *r*, *u*, and theſe turn in two holes made in the braſs ring F E. Now as the direction of theſe laſt pivots, *r*, *u*, is at right angles to the direction of the pivots, G, H, it will be eaſily underſtood, that in whatever direction the veſſel, and the box A B C D, which is fixed to it, may incline, the compaſs box, *i o*, remains always in an horizontal poſition, for it will turn either upon the pivots, *r*, *u*, or upon the pivots, G, H. K is the card which is fixed to the magnetic needle and moves with it, under the glaſs cover, through which it may be diſtinctly ſeen. The outer edge of this card is divided into 360 degrees, and within the circle of thoſe diviſions it is again divided into 32 equal parts or arches, called *the points of the compaſs*, or *rhumbs*. Theſe rhumbs are uſually divided into quarters. Their names, beginning from the north point, and going all round, are as follow: the letters ſtanding N, for north; E, for eaſt; S, for ſouth; and W, for weſt.

N.
N. by E.
N. N. E.
N. E. by N.
N. E.
N. E. by E.
E. N. E.
E. by N.
E.
E. by S.
E. S. E.
S. E. by E.
S. E.
S. E. by S.
S. S. E.
S. by E.
S.
S. by W.
S. S. W.
S. W. by S.
S. W.
S. W. by W.
W. S. W.
W. by S.
W.
W. by N.
W. N. W.
N. W. by W.
N. W.
N. W. by N.
N. N. W.
N. by W.

The conſtruction which has been more generally uſed in the royal navy, is an improvement of the late Dr. Knight, a gentleman of very extenſive knowledge in magnetiſm. In this conſtruction the weight of needle, card, &c. is removed conſiderably below the point of ſuſpenſion or centre of motion, by the addition of a braſs circle, whoſe diameter is equal to that of the card, which is made very thin. This ring being fixed below the card, and the needle above it, the centre of gravity of the whole comes low enough to admit of the cap being ſituated below the needle; hence the needle needs not be perforated. This needle is a perfect parallelopiped. The *figs.* 11 and 12 repreſent the lower and upper parts of this (Dr. Knight's) card, needle, &c. about one half of the real ſize. A B is the needle, and C repreſents the upper part of its cap, ſituated below it. The under part of the cap is ſeen at G; A D D B is the card. The braſs edge, or circle, is repreſented by F E O, and is faſtened to the extremities of the needle, (the card being interpoſed) by means of two ſcrews. H, I, are two ſliding weights to balance the card.

A few years ago another ſort of conſtruction was contrived by Mr. K. M'Culloch, for which he obtained a patent. The *figs.* 13 and 14 repreſent this compaſs, the former being a ſection, and the latter a perſpective view of it. In this compaſs, both the compaſs-box and the needle, with the card, are ſuſpended upon points, the extremities of which come very near to each other; which conſtruction keeps them horizontal without any gimbals, as will be eaſily manifeſted by the following deſcription. *Fig.* 13. A *a a a a*, is the common wooden box, with its lid; *b b* the braſs compaſs box; *c c* the glaſs cover to it; *d d* the hollow conical bottom; *e* the prop, upon which the compaſs is ſupported inſtead of gimbals; the ſpherical top of which is finely poliſhed, and the apex of the hollow cone is fitted to receive it; *f f* is a quantity of lead run round the bottom and cone of the compaſs box, to balance and to keep it ſteadily horizontal; *g g* is the card, and the magnetic needle, bent in ſuch a manner as to bring the point of the conical pivot, on which it moves and is ſupported, very near to the centre of gravity, as well as to the centre of motion; *h h* are two guards, which, by means of the two pins *i*, *i*, affixed to the compaſs-box, prevent its turning round, and deceiving the ſteerſman. In *fig.* 14, both the lid and the front of the box are removed; *h h* are the guards; *b* the compaſs-box, and *e* is the prop which ſupports the box.

The greateſt inconvenience that attends the uſe of the compaſs at ſea is the irregularity of motion induced by ſhocks of ſudden impulſes. In thoſe caſes the veſſel is ſuddenly moved out of its direction, and the card of the compaſs is ſet a vibrating for a conſiderable time, during which the ſteerſman is unable to regain his courſe. Several methods have been tried for the purpoſe of removing this inconvenience, and the above deſcribed compaſs of Mr. M'Culloch's contrivance was ſuppoſed to accompliſh this end in a conſiderable degree; but the experience of ſome years ſhews that this is not the caſe. The leaſt ſkilled ſeamen do not like the needles of their compaſſes too powerfully magnetized, becauſe, they ſay, then the needles are not ſteady. The fact is, that when the needle is not ſtrongly magnetic, it follows the irregularities of the ſhip's motion in a great degree; which renders it apparently more ſteady; but the very ſame cauſe which enables it to follow the irregular motion of the ſhip, prevents at the ſame time its placing itſelf in the magnetic meridian. With the ſame degree of impropriety, ſome perſons have endeavoured to prevent the irregular ſhocks or vibrations of the magnetic needle by increaſing the friction between the cap of the needle and the pointed wire which ſupports it. Sometimes pieces of paper, like wings, have been ſtuck to the lower ſurface of the card, which, by offering a reſiſtance againſt the air in the box, check in ſome meaſure the irregular movements of the card. In the year 1779, Dr. Ingenhouſz preſented a paper to the Royal Society, which is publiſhed in the 69th vol. of the Philoſophical Tranſactions, and in which he deſcribes ſome experiments, made by magnetic needles in water, where he found that a ſtrong magnetical needle placed itſelf in the magnetic meridian, nearly as well under water as in the open air, and that by the reſiſtance of the medium, much of its too great verſatility was taken away. In conſequence of thoſe experiments the Dr. propoſed to encloſe the magnetic needle in ſome fluid for the uſe of veſſels. "Common water," he ſays, "would be, perhaps, the beſt medium for theſe different contrivances, if ſteel was not ſo eaſily ruſted by it, and if in cold weather water was not ſo apt to freeze; therefore, I think, that ſome of the thinneſt expreſſed oils would anſwer the purpoſe better. The glaſs baſon containing ſuch a compaſs ſhould be full of the liquid to the cover, to obſtruct undulating motions." But though this propoſal appeared at firſt very promiſing, and ſome eminent philoſophical inſtrument-makers were much ſtruck with it; yet it does not appear that it was ever adopted.

The uſe of the compaſs in general is to direct a perſon along any required track, which makes a known angle with the direction of the magnetic needle; and this renders the compaſs applicable to a variety of purpoſes; thus it guides travellers in deſerts, as in Arabia, in the woods of America, &c.; it enables the navigator to proceed in any required track; it is highly uſeful to the miner, by ſhewing the direction of ſubterranean places; it ſerves for meaſuring horizontal angles; hence it is uſeful in land-ſurveying, taking plots, finding bearings in dialling, &c. And laſtly it ſerves to ſet ſun-dials, and other aſtronomical inſtruments when no great accuracy is required. The application of the compaſs to thoſe purpoſes is ſo very obvious, as not to require any farther illuſtration. But for ſome of theſe purpoſes, ſights muſt be applied to it, as in the azimuth compaſs.

The *azimuth compaſs* is a ſteering compaſs of any of the above-mentioned conſtructions, to which two ſights are adapted, through which the ſun is to be ſeen, in order to find its amplitude or its azimuth, whence the declination of the magnetic meridian from the true or aſtronomical meridian may be determined; thoſe two meridians ſeldom coinciding. At preſent (1807) in London, the declination of the magnetic needle is about 24° 9′ weſt; that is, the northern extremity of the magnetic needle, points to a part of the heavens, which makes an angle of about 24° 9′ with the true North. But this declination is various at different times in the ſame place, as well as at different places at the ſame time.

The more uſual ſort of azimuth compaſſes is repreſented in *fig.* 15, where F, G, are the ſights, or ſight vanes, in one of which, G, there is an oblong aperture, with a perpendicular thread or wire through its middle; and in the other ſight, F, there is a narrow perpendicular ſlit. A thread or wire, H I, is ſtretched from one ſide of the edge of the box to the other. The ring A B of the gimbals reſts with its pivots on the ſemicircle C D, the foot, E, of which turns in a ſocket, ſo that whilſt the box, K L M, remains ſteady, the compaſs may be turned round, in order to place the ſights, F, G, in the direction of the ſun, or other celeſtial object. The pivots of the gimbals of this, as well as of the ſteering compaſs in general, ſhould lie in the ſame plane with the point of ſuſpenſion of the needle or card, for the purpoſe of avoiding the irregularity of its vibrations as much as poſſible. In the inſide of the box there are two lines drawn on its ſides perpendicularly down, from the points where the thread, H I, touches the edge of the box. Theſe lines ſerve to ſhew how many degrees the north or ſouth pole of the needle is diſtant from the azimuth of the ſun; on which account the middle of the apertures in the ſight vanes, F and G, the thread H I, and the above-mentioned two lines muſt ſtand exactly in the ſame vertical plane. The uſe of the thread H I, which is ſometimes omitted in compaſſes of this ſort, is to ſhew the degrees between the magnetic meridian and the azimuth, &c. when the eye of the obſerver ſtands perpendicularly over it. On one ſide of the box of the azimuth compaſs, there generally is a nut or ſtop, which, when puſhed in, bears againſt the card and ſtops it; and this is done for the purpoſe of reading that degree, half degree, &c. of the card, which coincides with one of the perpendicular lines in the inſide of the box.

Mr. M'Culloch's azimuth compaſs is repreſented in *fig.* 16, where *b* is the compaſs-box, *h* one of the guards, *e* the prop, which ſtands in a braſs ſocket, and may be turned round at pleaſure, 1 is a braſs bar upon which the ſight vanes are fixed; 2, a dark glaſs, which moves up or down on the ſight vane 3; 4 is a magnifying-glaſs, which is alſo moveable on the other ſight vane; 5 is the nonius or vernier; 6 a ſlide for moving the vernier ſo as to ſtop the card in taking the azimuth; and 7 a double convex glaſs, through which the diviſions on the vernier may be read with accuracy.

In order to obſerve at ſea the magnetic amplitude of a celeſtial object (*viz.* its bearing by the compaſs when in the horizon) with the azimuth compaſs, place the inſtrument on a ſteady place, whence the horizon may be clearly ſeen; and looking through the ſight vanes of the compaſs, turn the inſtrument round, until the centre of the ſun's diſk, or other celeſtial object, may be ſeen through the narrow ſlit in one of the ſight vanes, exactly on the thread which biſects the other ſight vane; and at the inſtant that the centre of the celeſtial object, whether riſing or ſetting, is in the horizon, puſh the ſtop in the ſide of the box, ſo as to ſtop the card, then read the degree, half degree, &c. of the card, which ſtands againſt one of the perpendicular lines in the inſide of the box, and this is the magnetical amplitude ſought.—In this obſervation, ſome allowance muſt be made for the height of the obſerver's eye, above the level of the ſea. The true amplitude of the celeſtial object is an arch of the horizon contained between the eaſt or weſt points of the horizon, and that point of the horizon which the centre of that celeſtial object cuts in its riſing or ſetting. In order to find the true amplitude of the celeſtial object, the latitude of the place of obſervation, and the actual declination of that object, muſt be known; then ſay, as the coſine of the latitude is to radius, ſo is the ſine of the declination to the coſine of the amplitude ſought.

To obſerve at ſea the magnetic azimuth of a celeſtial object, (*viz.* its bearing by the compaſs when above the horizon), ſituate the inſtrument in a ſteady place, and looking through the narrow ſlit in one of the ſight vanes, turn the box round until the centre of that object appears to coincide with the thread in the ſlit of the other ſight vane, or till the ſhadow of that thread, when the ſun is obſerved, falls exactly along the line on the ſurface of the compaſs-box, and at that inſtant ſtop the card; then read the degree, &c. as above directed with reſpect to the amplitude, and thus you have the magnetic azimuth of that object.—The true azimuth of that object is an arch of the horizon intercepted between the north or ſouth point, and that point in which a plane paſſing through the zenith and the celeſtial object, cuts the horizon. In order to find this azimuth, the latitude of the place of obſervation, the declination of the celeſtial object and its altitude muſt be known; and ſince to determine the declination of the magnetical needle, this true azimuth of a celeſtial object muſt be taken at the ſame time that its magnetic azimuth is taken; therefore the altitude of that object muſt be taken with a ſextant, at the very inſtant that its magnetic azimuth is taken; *viz.* at the time the card is ſtopped; then proceed in the following manner: If the declination and latitude be both north or both ſouth, call the co-declination A; but if they be one ſouth and the other north, add 90° to the declination, and call the ſum A. Call the difference between the co-latitude and co-altitude B. Let the half of the ſum of A and B be called D; and the half of their difference be called C; then add together the four following logarithms, *viz.* the arithmetical complement of the logarithmic ſine of the co-latitude, the arithmetical complement of the logarithmic ſine of the co-altitude, the logarithmic ſine of D, and the logarithmic ſine of C. Half the ſum of thoſe four logarithms is the logarithmic ſine of half the azimuth ſought.

Now, having ſhewn how to find the true and the magnetical amplitudes as well as azimuths, we ſhall briefly add the method of determining from them, the declination of the magnetic needle for the time and place when and where the obſervations are made. Let the amplitudes, as well as the azimuths, be all reckoned from the north point, which is effected by ſubtracting the amplitude from 90° when it is on the northward of the eaſt or weſt points; or by adding it to 90° when it is ſouthward of the ſaid points. Then the magnetic amplitude is either ſmaller or greater than the true amplitude. When the magnetic amplitude is leſs than the true, and they are both on the ſame ſide of the north point, their difference is the declination of the magnetic needle towards the contrary ſide of the north point. But if they be on different ſides of the north point, then their ſum is the declination towards the ſame ſide with the true amplitude. When the magnetic amplitude is greater than the true, and they are on the ſame ſide of the north point, their difference ſhews the declination towards the ſame ſide. But if they be on different ſides, then their ſum is the declination towards the ſame ſide with the true amplitude. Thus, for example, if the magnetic amplitude is 80° eaſtward of the north point, and the true amplitude is 82° towards the ſame ſide; then the declination is 2° weſt. And if the magnetic amplitude be 76° eaſtward of north, whilſt the true amplitude is 5° weſtward of north, then the declination is 81° weſt. The ſame directions, *mutatis mutandis*, are to be followed for finding the declination from the magnetical and true azimuths.

Ever ſince the diſcovery of the declination of the magnetic needle from the true meridian, which appears to have been firſt obſerved by Columbus in his firſt voyage towards the continent of America, in the year 1492, the cauſe of that phenomenon has been earneſtly ſought after by inquiſitive perſons in the ſcientific world; and eſpecially when it was found that this declination varies continually, in a manner, which has not, as yet, been reconciled to any theory. The moſt promiſing method of inveſtigating the ſubject appeared to be that of obſerving attentively the daily, and even the hourly, variation of the declination, in order to diſcover, if poſſible, any period in it, or any dependance of it upon other natural phenomena. And in fact, the late ingenious Mr. Canton, who made numerous obſervations relative to the ſubject, found a periodical increaſe and decreaſe of the magnetical variation, in great meaſure correſponding with the temperature of the different parts of a natural day. For this purpoſe accurate compaſſes were fixed in various obſervatories, and the variation of the magnetic needle has been obſerved, at leaſt once every day, for a great many years; ſuch obſervations having frequently been inſerted in meteorological journals, and elſewhere.

The variation compaſs being intended to ſhew the daily variation of the magnetic needle upon land, is generally made longer than thoſe that are uſed at ſea; and, as it is not neceſſary to turn it round, the box generally is of an oblong form, ſo that the angular motion of the needle in it may amount to about 40° or 50°. The divided arches are either within the box, concentric with the point of ſuſpenſion of the needle; or out of it, on a frame, the particular conſtruction of which will appear from the deſcription of the variation compaſs of the Royal Society of London, which will be given preſently. When the divided arches are within the box, in which caſe a nonius is often placed on one extremity of the needle, the variation is known by obſerving the diviſion which coincides with the axis of the needle. In either conſtruction, it is evident that the beginning of the diviſions of the arch or arches muſt be placed exactly in the meridian of the place; or elſe its deviation from the meridian muſt be accurately known and allowed for in reading the degrees of magnetical variation. And it is almoſt ſuperfluous to add that ſuch compaſſes muſt be ſituated in very ſteady places, out of the influence of iron; ſo much ſo that it will be proper for the obſerver, when he examines the compaſs, &c. to take out of his pockets, keys, knives, or any other article of ſteel and iron; for otherwiſe theſe will ſenſibly alter the direction of the needle. We ſhall now ſubjoin the particular deſcriptions of two variation-compaſſes of the beſt conſtruction, *viz.* of that which is uſed at the Royal Society, and is deſcribed by the honourable Henry Cavendiſh, in the 66th vol. of the Philoſophical Tranſactions; and of that which was contrived by Mr. Cavallo, and is deſcribed in his "Treatiſe on Magnetiſm;" the former of which, being much larger, is well calculated for a fixed obſervatory, whilſt the latter is ſmaller, more compact, and may be eaſily fixed in any place.

Fig. 17, is a plan of the Royal Society's variation-compaſs. "In this inſtrument, the box which holds the needle is not fixed, but turns horizontally on a centre, and has an index faſtened to it, pointing to a divided arch on the braſs frame on which it turns; and the method of obſerving is to move the box, till a line drawn on it points exactly to the end of the needle; which being done, the angle that the needle makes with the ſide of the frame is ſhewn by the index. A B *b a* is the braſs frame, the ſides A B and *a b* being parallel: E*e* is a circular plate faſtened thereto, on which C D *d c*, the box which holds the needle, turns as on a centre; N*n* is the needle, the pin on which it vibrates being fixed in the centre of the plate E*e*; B*b* is the diviſion on the braſs frame; and G the index faſtened to the box, C D *d c*, furniſhed with a vernier diviſion; the diviſion and vernier being conſtructed ſo as to ſhew the angle which the line, F*f*, makes with A B, or *a b*. The inſtrument is placed in the meridian by the teleſcope, M *m*, the line of collimation of which is parallel to A B, and is pointed to a mark fixed due north of it. *Fig.* 18, is a vertical ſection of the inſtrument paſſing along the line F*f*; A B is the braſs frame; C D *d c* is the box which holds the needle; E*e* the circular plate on which it turns; N*n* is the needle; P and *p* are ſmall plates of braſs fixed to the ends of it, on each of which is drawn a line ſerving by way of index. Theſe pieces of braſs are raiſed to ſuch a height that their tops are on a level with the point of the pin on which the needle turns. The uſe of them is, that it is much eaſier obſerving this way, than when the lines, ſerving by way of index, are drawn on the needle itſelf, as by this means the inconvenience proceeding from one kind of vibration in the needle is avoided. S, and *s*, are two braſs plates, on each ſide of which is drawn a line, to which the index at the end of the needle is to point; there is alſo a line parallel to theſe, drawn on the bottom of the box; theſe three lines form the line, F*f*, in *fig.* 17. R is a double microſcope intended to aſſiſt us in judging when the index, P, points exactly to the line, F, that is, to the line drawn on the plate S. It is placed ſo that a wire, W *w*, in its focus, appears to coincide with this line; and in obſerving, the box is moved till the wire appears alſo to coincide with the index P. The cap in the centre of the needle is made to take on and off readily, and to fit on upon either face; ſo that we may on occaſion obſerve with the under face of the needle uppermoſt. The intention of inverting the needle is to ſhew whether the axis of the figure of the needle coincides with its magnetic axis.

The *figures* 19 and 20, exhibit a vertical view, and a ſection of Mr. Cavallo's variation-compaſs, and thoſe repreſentations are two thirds of the real ſize of the inſtrument. The letters of reference indicate the ſame parts in both figures. A B D is a braſs bottom with a circular braſs piece, *cei*, ſcrewed faſt upon it. F G H K is a rim likewiſe of braſs, that ſlides on the outſide of the circular piece *cei*, and to which the flat glaſs, M, is faſtened; ſo that when the rim is removed, the glaſs comes off with it. The ſhape of the needle is clearly indicated by the figures. It has a hole in the middle to receive the agate cap, which is burniſhed into a braſs ſocket, and is ſo ſituated into the needle, that the apex of its cavity does not riſe higher than the ſurface of the needle; hence the point of ſuſpenſion upon the pin, B, is even with the upper ſurface of the needle. By this means the pendulum-like oſcillations cannot diſturb the direction of the fine lines marked on the extremities of this needle. The upper and lower ſurfaces of this needle are quite alike, and the braſs ſocket, which contains the agate cap, is made ſo as to admit of the needle's being turned with either of theſe ſurfaces upwards. The hole in the middle of the needle is quite cylindrical, and ſo is the outſide of the braſs ſocket, which fits the ſaid hole exactly, but projecting a little way beyond the needle, has a ſcrew cut on that projection, upon which another circular piece of braſs is ſcrewed to fix it, as may be ſeen in *fig.* 20. It is evident, therefore, that when the laſt-mentioned piece of braſs is unſcrewed, the ſocket with the agate cap, may be put in on either ſide of the needle, and may be faſtened on the oppoſite ſide of it. By this means a great ſource of error may be avoided, namely what ariſes from the magnetical axis of the needle being not in the axis of its figure, which is frequently the caſe; for, if the direction of this needle be obſerved with one ſide of it upwards and then (the needle being turned) be obſerved again with the other ſide upwards; either the ſecond obſervation coincides with the firſt, and then we may conclude that the magnetical axis of the needle is truly in its middle; or the obſervations differ, and thence we ſhall know that the magnetical axis of the needle is not in the axis of its figure; but in this caſe we may have the real magnetic direction by taking a mean of the two obſervations; or we may thereby aſcertain, once for all, how much the line of direction of the needle deviates from its magnetic axis, which, when once aſcertained, becomes a fixed quantity to be either ſubtracted from, or added to any other obſervation."

"The upper ſide of the circular piece *cei* is ſilvered, and divided into degrees and half degrees; but thoſe diviſions, being too minute, are omitted in the figure. The bottom A B D has two projections, A and D, oppoſite to each other, and on each of their chamfered edges a line is marked, which, being drawn at the ſame time that the circle, *cei*, is divided by the circular dividing engine, coincide exactly with the commencement of the numeration of the degrees on the oppoſite ſides of the circle, from which places the degrees run on both ſides as far as 90°. The needle, therefore, which lies with its upper ſurface even with the divided circle, points to the ſame degree and part of a degree with both its extremities."

"We come now to deſcribe the method of meaſuring the parts of a degree on the circle, which is only divided into half degrees. This is obtained by means of the microſcope, *fig.* 21., which is furniſhed with one of my mother-of-pearl micrometers. (Phil. Tranſ. vol. 81.) The external conſtruction of the microſcope, and likewiſe the manner of placing it perpendicularly upon the compaſs box, are indicated by *fig.* 21; at N in *fig.* 19; and by the dotted lines at K, in *fig.* 20. P is a ſhort tube ſupported by the uprights R, R, the lower parts of which project horizontally. Theſe horizontal projections, O, O, are notched at Y, ſo as to fit the mouldings, H, K, of the rim F G H K, when the parts, O, O, reſt upon the glaſs. By this means the microſcope may be moved all round the compaſs-box, whilſt it keeps ſome of the diviſions of the circle always in the field of view. The body of the microſcope may be moved up and down in the tube P, in order to adjuſt it for diſtinct viſion. It conſiſts of the tube S S, into the upper part of which ſlides a ſhort eye-tube T, and at its lower extremity, H, a lens is faſtened. Two other lenſes are fixed into the tube T, which is about nine-tenths of an inch long, and within it; *viz.* exactly in the focus of the eye lens, the mother-of-pearl micrometer is ſituated. Thoſe three lenſes are all of the plano-convex ſort. The focus of the upper one is about four-tenths of an inch, and the focus of the ſecond and third is about ſix-tenths of an inch. The diviſions of the micrometer are 300ths of an inch, and when viewed through the microſcope, and the microſcope is placed upon the compaſs, 15 of them appear to be exactly equal to half a degree on the circle *cei*. But there is no need for thoſe diviſions to be exactly

300ths of an inch. It is ſufficient if they are nearly ſo, as, for inſtance, from about 280 to 320 in an inch; becauſe by pulling the tube T more or leſs out of the tube SS, and by moving the laſt mentioned tube up or down into P, the diviſions of the circle may be magnified more or leſs, till 15 diviſions of the micrometer appear to be exactly equal to the ſpace between any two contiguous diviſions on the circle; *viz.* to half a degree. When the microſcope has been once ſo adjuſted, it requires no farther alteration, excepting to be moved round the box until it comes over the end of the needle, in which ſituation the field of view appears as ſhewn in *fig.* 22, where the middlemoſt part is occupied by the micrometers 1, 2, 3, 4; the other large diviſions are the magnified diviſions of the circle, and W is the extremity of the needle, with its directive line pointing to ſome diviſion on the micrometer."

"Fifteen diviſions of the micrometer being equal to half a degree, or to 30′, it follows that each diviſion is equal to two minutes, and as it may be eaſily diſcerned whether the line on the end of the needle is directed exactly to one of thoſe diviſions or midway between two of them, therefore the direction of the needle in this compaſs may be read off to a ſingle minute. In order to obſerve the daily variation, when this compaſs is properly fixed, the microſcope need not be moved, becauſe its field of view takes in about two degrees, which is a much greater ſpace than the needle will go through in ten years time. In moving the microſcope round the box, care muſt be taken to place it ſo that the diviſions of the circle may appear to coincide with ſome of the long diviſions of the micrometer.—N. B. This microſcope inverts the objects; therefore what appears to be on the right hand muſt be underſtood to lie on the left, and *vice verſâ.*"

"In order to obſerve the real direction of the magnetic needle, or the daily variation, the compaſs muſt be placed ſo as that the two lines marked on the projections A and D, *fig.* 19, may coincide with a meridian line drawn upon a board, a ſtone, a block, &c. and then the degrees and minutes, to which the extremity of the needle is directed, will ſhew the required variation."

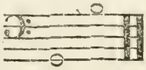
Having, in the preceding paragraphs, mentioned all the important particulars relating to the diſcovery, the conſtruction, and the uſe of one of the moſt remarkable, and the moſt uſeful, philoſophical inſtruments, we ſhall conclude by mentioning a deception which has ſometimes been offered to the credulous and unſkilled part of mankind. It is a compaſs, or a magnetical needle which was pretended to point due north and ſouth, without any variation at any time or place; and compaſſes apparently of this deſcription have actually been offered for trial and have even been ſent abroad. But upon examination it has been found either that the north and ſouth points of the card were not placed over the north and ſouth points of the needle; or that the needle, having been made purpoſely broad, had been magnetized ſo that the direction of its poles made an angle with the axis of its figure, juſt equal to the magnetical declination at that particular time and place. The conſequence of this artifice is, that though the needle may appear to have no declination at that particular time and place; yet at any other time, or if moved to another place where the magnetical declination is different, its direction will deviate from the true meridian. The declination or variation, like the attraction and repulſion, belongs to every piece of magnet, be it natural or artificial, and the magnetic needle is of the latter ſort; nor can, at the ſame time and in the ſame place, one needle point to one part of the heavens whilſt others point to a different part; provided they be freely ſuſpended, and be uninfluenced by iron or other magnets.

COMPASS *of voices*, in *Muſic*. In early times of counterpoint, human voices of different compaſs, occaſioned by age, ſex, and natural organ, were claſſed and divided into four diſtinct kinds, at the diſtance only of a third above each other, which the baſe, or F clef, placed from line to line, expreſſed. The loweſt of theſe was called the tenor, the next contratenor, motetus the third, and triplum the higheſt, or treble; of which term this was the origin.

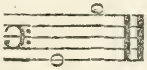
After this, about the middle of the fifteenth century, as different parts began to be multiplied, the ſcale received ſix diviſions: baſe, baritono, tenor, contralto, mezzo ſoprano, and ſoprano. The natural pitch of theſe is about three or four notes above each other, as their ſeveral clefs, which originally ſerved as barriers, will diſcover.

It ſeldom happens that a voice has more than ten real, ſteady, and full, natural notes, in its compaſs, without a mixture of falſet, which, being of a different regiſter, is eaſily diſcovered. The following are the names and uſual extent of the ſeveral ſpecies of human voice.

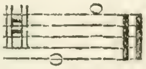
1. *Baſe.*



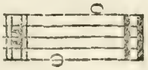
2. *Baritono.*



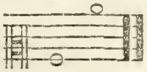
3. *Tenor.*



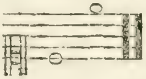
4. *Contralto.*



5. *Mezzo Soprano.*



6. *Soprano.*



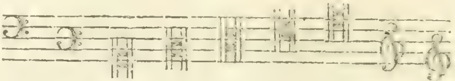
But as there are ſometimes baſe voices which go down to double F, and even lower; ſo there are in the treble, among modern vocal phenomena, ſingers that go higher than F in altiſſimo; which make the whole diapaſon of voices exceed four octaves. And there is at preſent (1802) in England, a German buffo ſinger with a baſe voice that goes down to double gammut in real muſical tones; and in falſet, up to G on the ſecond line in the treble. No public uſe was made of this extraordinary voice. He arrived in autumn, when no theatres were open, and remained but a ſhort time.

But though parts in choral muſic were multiplied, not only to ſix, but even thirty-ſix, before the cloſe of the fifteenth century; yet the general, and eſtabliſhed number, in the pope's chapel, by which probably all other choral ſervice was regulated, amounted to no more than four: cantus, altus, tenor, and baſe; which ſee ſeverally.

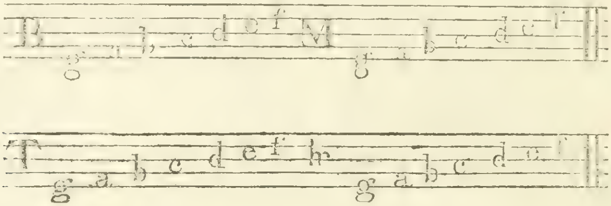
If it be aſked why ſo many clefs are uſed? It may be anſwered, to keep the melody of theſe ſeveral voices within the compaſs of the five line ſtaff; to prevent the perplexity of a great number of leger-lines, which in ſinging and playing at ſight, frequently alarm and embarraſs the performer.

Of all the expedients propoſed by ſpeculative and ingenious men, for the abolition of tenor clefs, the only one that ſeems practicable, and has the merit of great ſimplicity, was publiſhed in our own country in the time of Charles II. under the title of "An Eſſay to the advancement of Muſic, by caſting away the perplexity of different cliffs; and uniting all ſorts of muſic, lute, viols, violins, organ, harpſichord, voice, &c. in one univerſal character, by Thomas

Salmon, A. M. of Trinity College, Oxford." London, 1672. This book is well written, and, though very illiberally treated by Lock, Playford, and ſome other profeſſors, contains nothing that is either abſurd or impracticable; nor could I diſcover, ſays Dr. Burney, any other ſolid objection to its doctrines being adopted, than the effect it would have upon old muſic, by ſoon rendering it unintelligible. At preſent the tenor cliff alone is thought an inſuperable difficulty in our country, by Dilettanti performers on the harpſichord; but if Salmon's ſimple and eaſy muſical alphabet were chiefly in uſe, the baſe cliff would likewiſe be ſoon rendered as obſolete and difficult as the tenor; ſo that two parts or cliffs out of three, in preſent uſe, would become unintelligible. The author's plan was ſimply this: inſtead of the eight or nine cliffs that were then in uſe, as,



to expreſs the whole ſcale of ſounds on the five lines and ſpaces in this ſimple manner:



G in every part of the ſcale being on the firſt line, *a* on the firſt ſpace, *b* on the ſecond line, &c. the letters preceding each ſeptenary implying baſe, mean, treble, ſupreme. To this propoſal there ſeems no cogent objection; profeſſors would not be humbled by having any thing to learn. The baſe clef, which every tyro knows, repeated in octaves, without changing a ſingle name or character, would accompliſh the whole buſineſs. The principal evil, and a great evil it would be, is the certainty of ſoon rendering all former muſic, printed or in manuſcript, obſolete and unintelligible. This has been effected in a great meaſure, lately, by new editions of the harpſichord and organ muſic of the laſt century, and the total rejection of every tenor clef in muſic for keyed-inſtruments; of which we have already pointed out the inconvenience. See ACCOMPANIMENT and CLEF.

COMPASS *of proportion*. See SECTOR and PROPORTION.

COMPASS *dials*, are ſmall dials, fitted in boxes, for the pocket, to ſhew the hour of the day by direction of the needle; which indicates how to place them right by turning the dial about, till the cock or ſtyle ſtand directly over the needle, and point to the northward; but theſe can never be very exact, becauſe of the variation of the needle itſelf. See DIAL.

COMPASS *Saw*. See SAW.

COMPASSES, or *pair of* COMPASSES, a mathematical inſtrument, uſed for the deſcribing of circles, meaſuring lines, &c. The common compaſſes conſiſt of two branches or legs, of iron, braſs, or other metal, pointed at bottom; and joined by a rivet, whereon they move, as on a centre. Thoſe are reckoned the beſt, part of whoſe joint is ſteel, and where the pin on which the joint turns is a ſteel ſcrew. The points ſhould alſo be made of hardened and poliſhed ſteel. In ſome the points are fixed; in others they may be taken off, and a drawing-pen, pencil, or dotting wheel, ſubſtituted in their room.

The invention of compaſſes is aſcribed to Talaus, nephew of Dædalus, by his ſiſter, whom, the poets ſay, Dædalus killed out of envy. We have compaſſes now of various kinds and contrivances, accommodated to the various uſes they are intended for; as,

COMPASSES *of three legs*, or *triangular compaſſes*. Their ſtructure is like that of the common compaſſes, ſetting aſide the exceſs of a leg, which has a motion every way: their uſe is to take three points at once, and ſo to form triangles: to lay down three poſitions of a map to be copied at once, &c. Two of the legs A, B (*Plate, Compaſſes, fig.* 1.) are jointed together like a common pair: the pin *a*, which connects them, has another leg D, jointed to it; the legs, A, B, are firſt ſet to two of the points, and the leg D is then moved farther from, or nearer to, the other legs by bending its joint; or it is turned round the pin *a* of the other legs as a centre, as occaſion may require.

Fig. 2, is another conſtruction of the triangular compaſſes. A, B, C, are three arms, at whoſe ends are jointed the arms *a*, *b*, *c*, carrying ſteel points; they are of ſuch lengths, that when cloſed they ſhall nearly meet in one point; by opening them as in the figure, they can be made to coincide with any three points within the reach of the arms.

COMPASSES, *Beam*, conſiſt of a long branch, or beam, carrying two braſs curſors; the one fixed at one end, the other ſliding along the beam, with a ſcrew to faſten it, on occaſion. To the curſors may be ſcrewed points of any kind; whether ſteel, pencils, or the like. To the fixed curſor is ſometimes applied an adjuſting or micrometer ſcrew, by which an extent is obtained to very great nicety. Mr. Ramſden conſtructed compaſſes of this kind whoſe micrometer ſcrew ſhews very perceptibly a motion of $\frac{1}{5000}$th part of an inch. It is uſed to draw large circles, to take great extents, &c. See *Plate, Compaſſes, fig.* 3, which exhibits a common pair of beam compaſſes. A A is a five-ſided bar, of mahogany, made very ſtraight and true; B, D are two frames of braſs, ſliding on the bar, that can be faſtened at any place by a clamp ſcrew *a b*, at the top of each; *c*, *f* are two pieces into which are inſerted the points, and are faſtened by a ſcrew; the ſliding frame B has a collar *g* ſcrewed to it, in which the ſcrew *h*, with a divided head, turns; this ſcrew is tapped into a piece of braſs faſtened at the end of the mahogany bar, ſo as to move the point at *f* very ſlowly when the ſcrew is turned.

COMPASSES, *Bow*, or *Bows*, are a ſmall ſort of compaſſes,

paſſes, that ſhut up in a hoop, which ſerves for a handle. Their uſe is to deſcribe arcs, or circumferences of circles of very ſmall radius. *Fig.* 4, is a ſmall pair of compaſſes, with a ſcrew for meaſuring ſmall diſtances very accurately, and deſcribing ſmall circles: *a* is one of the points faſtened to a ſocket, in which the ſcrew *b* works; *d* is a ſteel-bar attached to the ſame ſocket; *e* is a piece ſliding on the bar *d*, and carrying the other point; it has a projection above it, in which the ſcrew works; *f* and *g* are two pieces jointed to the points at one end, and to a ſmall handle *h*. at the other, which is uſed to hold them by. The head *l* of the ſcrew is divided into equal parts, which diviſions are read againſt a projecting part of the piece, holding the point *a*; and by turning it round one of the diviſions, the points are moved ſome fractional part of an inch, as $\frac{1}{100}$, or $\frac{1}{200}$, according to the number of threads in an inch of the ſcrew's length, and the number of diviſions on the head of the ſcrew.

Compasses, *Caliber*. See Caliber.

Compasses, *Clock-makers*, are very ſubſtantial, ſerving to cut paſteboard, braſs, &c. jointed like the common compaſſes with a quadrant, or bow, as the *ſpring compaſſes*, only its uſe is different; as ſerving here to keep the inſtrument firm at any opening. See Clock.

Compasses, *cylindrical and ſpherical*, uſed in taking the diameter, thickneſs, or caliber of round or cylindric bodies; ſuch as cannons, balls, pipes, &c. They conſiſt of four branches joined in a centre, two of them circular, and two flat, a little bent at the ends.

To uſe them, one of the flat points is put within the cannon, the other without: the two oppoſite points ſhew the thickneſs. See Caliber *Compaſſes*.

There are alſo *ſpherical compaſſes*, differing in nothing from the common ones, but that their legs are arched, ſerving to take the diameters of round bodies, &c. Another ſort of compaſſes has been lately invented, for meaſuring the diameter of round bodies, as balls, &c. which conſiſt of two flat pieces of metal, ſet at right angles, in a ſtraight bar or beam of the ſame; the one being fixed, and the other ſliding along it, ſo far as juſt to receive the round body between them; and then its diameter, or diſtance between the two pieces, is ſhewn by the diviſions marked on the beam.

Compasses, *Elliptic*. Their uſe is to draw ellipſes, or ovals of any kind: they conſiſt of a beam A B (*Plate, Compaſſes, fig.* 5.) about a foot long, bearing three curſors; to one of which may be ſcrewed points of any kind: to the bottom of the other two are rivetted two ſliding dove-tails, adjuſted in grooves made in the croſs branches of the beam. The dove-tails having a motion every way, by turning about the long branch, go backwards and forwards along the croſs: ſo that when the beam has gone half-way about, one of theſe will have moved the whole length of one of the branches; and when the beam has got quite round, the ſame dove-tail has got back the whole length of the branch. Underſtand the ſame of the other dove-tail.

Note, the diſtance between the two ſliding dove-tails is the diſtance between the two foci of the ellipſis; ſo that by changing that diſtance, the ellipſis will be rounder or ſlenderer. Under the ends of the branches of the croſs are placed four ſteel points to keep it faſt.

The uſe of this compaſs is eaſy; by turning round the long branch, the ink, pencil, or other point, will draw the ellipſis required. Its figure ſhews both its uſe and conſtruction.

Compasses, *German*, whoſe legs are a little bent outwards towards the top; ſo that, when ſhut, only the points meet.

Compasses, *Hair*, ſo contrived within ſide, as to take an extent to a hair's breadth. The outward appearance of the hair compaſſes is like that of a common pair of compaſſes; the peculiarity conſiſts in one of the legs A, being attached to the braſs by a ſpring B (*fig.* 6.), whoſe action throws the leg inwards, and is counteracted by a ſmall ſcrew D; by turning which the leg can be moved ſmall diſtances, and ſet to the greateſt nicety, without moving the joint.

Fig. 7, repreſents a pair of pocket compaſſes, the legs, *a*, *b*, of which are hollow, and contain, the one a pen, *d*, and the other a port-crayon *e*, at the oppoſite end of each point, *f* and *g*.

Compasses, *Lapidary's*, a piece of wood in form of the ſhaft of a plane, cleft a-top, as far as half its length; wherewith they meaſure the angles, &c. of the precious ſtones, as they cut them. In the cleft is a little braſs rule, faſtened there, at one end, by a pin; but ſo that it may be moved in the manner of the bevel; with this kind of ſquare they take the angles of the ſtones, laying them on the ſhaft as they cut them.

Compasses, *Proportional*, are thoſe whoſe joint lies between the points terminating each leg: they are either *ſimple* or *compound*. In the former ſort the centre is fixed, ſo that one pair of theſe ſerves only for one proportion.

Compasses, *Compound proportional*, conſiſt of two branches (ſee *fig.* 8), each pointed at either end with ſteel: the length of the branches is cut through, for a curſor to ſlide up and down; in the middle of which curſor is a ſcrew, ſerving to join the branches, and to fix them at any point required.

On the one leg are diviſions, ſerving to divide lines into any number of equal parts, for reducing of figures, &c. On the other are numbers, for inſcribing any regular polygon in a circle propoſed.

The uſe of the firſt is eaſy: Suppoſe v. gr. a right line required to be divided into three equal parts; puſh the curſor till the ſcrew be juſt on the figure 3; where fixing it, take the length of the given line between the two longeſt parts of the legs: the diſtance between the two ſhorteſt will be one third of the given line. In the ſame manner may the line be divided into any other number of parts.

For the uſe of the line of polygons: Suppoſe, v. gr. a pentagon required to be inſcribed in a circle: puſh the curſor till the middle of the ſcrew be againſt 5, the number of ſides in a pentagon; between the ſhorteſt parts of the legs take the ſemidiameter of the circle: the legs thus opened, the diſtance between the points of the longeſt parts will be the ſide of the pentagon to be inſcribed in the circle. And thus for a figure of any other number of ſides.

Fig. 9. is a pair of proportional compaſſes; the braſs part of the two legs A, B, have longitudinal openings in them, for the pin, round which they move as a centre, to ſlide in, and can be fixed at any place by a ſcrew *a*, ſo that the diſtance from the centre to the points *c*, *d*, ſhall be twice, three times, (or any other aliquot part) of the diſtance to the points *e*, *f*, and of courſe the openings at each end will be in the ſame proportion.

Fig. 10, repreſents a method of adapting a quick and ſlow motion to a pair of theſe compaſſes; *a* is a braſs bar, with an oblong opening cut in it, to receive a ſcrew, *b*, faſtened to one leg of the compaſſes; the other end of the bar, *a*, is cut into a ſcrew, with a fine thread, and has a nut, *f*, on it, turning in a collar jointed to the other leg of the compaſſes. When the ſcrew, *b*, is looſe, the compaſſes can be ſet to any opening; but when it is faſt, they can only be moved by turning the nut *f*. The ſcrew, *b*, is put into a hole in one of the legs of the compaſſes, ſo that it can eaſily be removed, and inſerted into a hole made in the moveable centre *g*, to give it a ſlow motion if required.

Compasses, *Proportional, with the ſector lines.* The ſtructure of theſe is ſo like that of the common proportional compaſſes, only a little nicer, that it needs no particular deſcription. See *fig.* 11.

The lines on the firſt face are the line of lines, marked *lines:* it is divided into 100 equal parts, every tenth numbered: and the line of chords, which goes to 60°, is marked *chords*.

On the other face are a line of ſines to 90°, and a line of tangents to 45°. On the other ſide are the tangents from 45° to 71° 34′; on the other, ſecants from 0° to 70° 30′.

For the uſe of theſe compaſſes: 1. To divide a line into any number of equal parts, leſs than 100: divide 100 by the number of parts required: ſlip the curſor till the line on the ſliding dove-tail be againſt the quotient on the line of lines; then the whole line being taken between the points of the compaſſes moſt remote from the centre, the aperture of the other will ſhew the diviſion required. 2. A right line given, ſuppoſed to be divided into 100 parts, to take any number of thoſe parts; ſlip the line on the ſliding dove-tail to the number of parts required; the whole line being taken between the points fartheſt from the centre, the aperture of the other two will include the number of diviſions required. 3. The radius being given, to find the chord of any arch under 60°; ſlip the line on the ſliding dove-tail to the degrees required on the line of chords; the radius being taken between the points fartheſt from the centre of the curſor, the aperture of the other line will be the chord required, provided the number of degrees be greater than 29; if it be leſs, the aperture taken from the radius will leave the chord required. 4. If the chord of an arch under 60° be given, and the radius required, ſlip the line on the dove-tail to the degrees given on the line of chords; the given chord being taken between the two points next the curſor, the aperture of the other will be the radius required. 5. The radius being given, to find the ſine of any number of degrees. Slip the line on the dove-tail to the degree on the line of ſines whoſe ſine is required; the radius taken between the points fartheſt from the curſor, the aperture of the other will give the ſine of the angle required. But if the ſine ſought be leſs than 30°, the difference of the apertures of the oppoſite points will be the ſine required. 6. The radius being given, to find the tangent of any number of degrees under 71°: if the tangent required be under 29° 30′, then ſlip the line on the dove-tail to the degree propoſed on the tangent line; the radius taken between the points fartheſt from the curſor, the aperture of the others will be the tangent of the degrees required: if the tangent required be above 29° 30′, but under 45°, the line on the curſor muſt be ſlipped to the degrees given on the tangent line; then the radius being taken between the points fartheſt from the curſor, the aperture of the others will be the tangent. If the tangent required be greater than 45°, but leſs than 56° 20′, ſlip the notch on the tangent ſide of the turned cheek to the degree 0 in the tangent line on the ſide of the compaſs; the radius taken between the points fartheſt from the curſor; the difference between the aperture of the other, and theſe, added together, will be the tangent required. Thus, for the tangents of other degrees under 71. After the like manner may the ſecant of any number of degrees under 71 be found.

Mr. Heath, a mathematical inſtrument-maker in London, conſtructed a pair of proportional compaſſes in 1746, with a curious and uſeful contrivance for preventing the ſhorter legs from changing their poſition, when theſe compaſſes were uſed. It conſiſted of a ſmall beam ſoldered to a ſcrew, and running parallel to the leg of the compaſſes, nearly of the length of the groove; in this beam a ſlit was made, which admitted of a ſliding nut, the other end of which fell into a hole in the bottom of the ſcrew, belonging to the great nut of the compaſſes. The ſcrew-pin of the beam paſſed through an adjuſter, by means of which the mark on the ſlider might be brought exactly to any diviſion. But the proportional compaſſes have been much out of uſe ſince the invention of the *ſector*, which ſee.

Compasses, *Spring*, or *Dividers*, are made of hardened ſteel, the head arched; which, by its ſpring, opens the compaſſes; the opening being directed by a circular ſcrew, faſtened to one leg, and let through the other, worked with a nut.

Compasses, *Triangular*. See Compasses *of three legs*, and Triangular.

Compasses, *Triſecting*, the invention of M. Tarragon, for the triſection of angles, geometrically.

The inſtrument conſiſts of two central rules, and an arch of a circle of 120 degrees, immoveable, with its radius; the radius is faſtened with one of the central rules, like the two legs of a ſector, that the central rule may be carried through all the points of the circumference of the arch. The radius and rule muſt be as thin as poſſible, and the rule faſtened to the radius hammered cold, to acquire an elaſticity; the breadth of the other central rule muſt be triple the breadth of the radius. In this rule there is a groove, with a dove-tail, to be faſtened on it, for its motion; in the centre of each rule muſt likewiſe be a hole. See the Journ. des Sçavans, Sept. 1688.

Compasses, *Turn-up*, a late contrivance to ſave the trouble of changing the points; the body is like the common compaſſes; towards the bottom of the legs, without ſide, are added two other points, beſide the uſual ones; the one carrying a drawing pen-point, the other a port-crayon; both adjuſted ſo as to turn round, and ſo be in the way of uſe, or out of it, as occaſion requires.

The points of ſmall compaſſes are tempered by a lamp and blow-pipe, heating them red-hot; when cold, they are hard: the larger are tempered by a charcoal fire and a blow-pipe, heating them to a cherry colour, then plunging them in water.

See M. Bion's Conſtruction and Uſes of Mathematical Inſtruments, by Stone; and Robertſon's Treatiſe on the ſame ſubject.

COMPASSEMENT *de feux*, in *Military Language*, a manner of fixing the diſtances between the chambers of mines, and diſpoſing of the ſauciſſons, ſo as to communicate the fire to them at one and the ſame inſtant of time.

COMPASSING, in *Naval Architecture*, a term uſed to denote ſuch pieces of timber as are incurvated into the figure of an arch.

Compassing *the king's death*, in *Law*. See Treason.

COMPASSION, in *Ethics*, a mixed paſſion, compounded of love and ſorrow, and excited by the ſight or recital of diſtreſs; or, as Dr. Hartley conciſely defines it, it is the uneaſineſs which a man feels at the miſery of another. Accordingly he traces it to ſeveral aſſociations, both in children and adults, upon which it ſeems to be grounded; and he obſerves, that perſons, whoſe nerves are eaſily irritable, and thoſe who have experienced great trials and afflictions, are in general, more diſpoſed to compaſſion than others; and that we are moſt apt to pity in thoſe diſeaſes and calamities which we either have felt already, or apprehend ourſelves in danger of feeling hereafter. A compaſſionate temper, ſays this writer, being great matter of praiſe to thoſe who are endued with it, and the actions which flow from it being a duty incumbent on all, men are led to practiſe theſe actions, and to inculcate upon themſelves the motives of compaſſion, by attending to diſtreſs, actually preſent, or deſcribed in hiſtory, real or fictitious.

Hobbes makes this a merely ſelfiſh paſſion, and defines it, as being fear for ourſelves; Hutcheſon reſolves it into INSTINCT; but Dr. Butler much more properly conſiders compaſſion as an original, diſtinct, particular affection in human nature.

According to Dr. Cogan, in his "Treatiſe on the Paſſions," compaſſion is that ſpecies of affection, which is excited either by the actual diſtreſs of its object, or by ſome impending calamity which appears inevitable. It is, ſays this writer, a benevolent ſorrow at their ſuffering or approaching miſery. The etymology of the word expreſſes this idea with ſtrict propriety, as it ſignifies "ſuffering with the object." Compaſſion is always connected with a diſpoſition to relieve, and will always prompt to vigorous exertion, wherever there is a poſſibility of ſucceſs; unleſs ſome important conſiderations ſhould render the endeavour improper or unjuſt. It has no neceſſary connection with the character of its objects; their diſtreſs being a ſufficient excitement. From the great extent and univerſality of this affection, it may be juſtly conſidered as a generic name, comprehending ſeveral other affections which have a more ſpecific application, as *mercy*, *commiſeration*, *pity*, &c. Dr. Reid remarks, that it ſeems to be falſe religion alone that is able to check the tear of compaſſion. We are told, he ſays, that in Portugal and Spain, a man condemned to be burned as an obſtinate heretic, meets with no compaſſion, even from the multitude; obſerving, that they are taught to look upon him as the enemy of God, and doomed to hell fire. But ſhould not this very circumſtance, he adds, move compaſſion? Surely it would, if they were not taught that, in this caſe, it is a crime to ſhew compaſſion, or even to feel it. Hobbes of Human Nature, cap. ix. ſect. 10. Hutcheſon's Enquiry into Moral Good and Evil. Butler's Sermons, ſerm. v. and vi. Hartley's Obſervations on Man. Cogan on the Paſſions. Reid's Eſſays on the Active Powers of Man, ch. iv.

COMPATIBLE, ſomething that may ſuit, or conſiſt with another. See INCOMPATIBLE.

COMPENDIUM, an abſtract, epitome, or reduction of a large matter into a little compaſs. See ABSTRACT and EPITOME.

COMPENSATION, an action whereby any thing is admitted as an equivalent to another.

COMPENSATION, in the *Civil Law*, is a kind of right, whereby a debtor purſued by his creditor, for the payment of a debt, demands that the debt may be *compenſated* with what is owing him by the creditor. *Compenſation* is equivalent to payment, and anſwers to that which is called SET-*off*, in common law.

COMPENSATION-*Balance*, in *Horology*, is the balance of a chronometer, ſo ingeniouſly contrived, that two oppoſite actions counteract each other's natural effects at all times upon it, and equaliſe its momentum under all the changes of temperature experienced in different climates and ſeaſons. The oppoſition of two natural effects, produced by an artificial arrangement of the acting parts, is very properly called the *compenſation*, which has been effected in various ways. The moſt ſimple compenſation that has been produced in a machine for meaſuring time, is that which depends upon the variable fluidity of the oil applied to the pivot holes of the balance arbor, and of the other arbors of a watch; oil, it is well known, however good, is more fluid in hot weather than in cold, and therefore diminiſhes the friction at the pivots more in ſummer than in winter, the conſequence of which variation in the friction of a watch with the ordinary crown-wheel eſcapement, would have its rate accelerated in the former ſeaſon, and retarded in the latter, by this ſimple cauſe, if there were no compenſating property in the ſtructure of ſome part of the mechaniſm; this property naturally exiſts in the balance and balance-ſpring, both which are ſubject to have their dimenſions enlarged by heat, and contracted by cold; and theſe changes alternately occaſion retardations and accelerations in the rate of going; but in ſuch a way, that when the watch is diſpoſed to have its rate accelerated by the moſt fluid ſtate of the oil, it is alſo diſpoſed to have the ſame retarded by the contemporary enlargement of the balance and balance-ſpring; hence the quantity that one of theſe diſpoſitions prevails over the other in any watch, when regulated to mean time at a mean temperature, conſtitutes its liability to vary its rate of going in different months of the year. Berthoud, who attempted to proportion the thickneſs of his pivots to ſuit the oil with a given balance, ſo as to produce an approximation towards a good compenſation, has called this the *natural* compenſation, which is a very proper appellation, as it exiſts in a certain degree in all chronometers and watches that have oil applied to them. This natural compenſation, however, is found to be a very imperfect one, and unfortunately interferes with the effects produced by the better compenſations, which, in oppoſition to this, may be called the *artificial* compenſations. To baniſh the interference of the variable effects produced by oil, is one of the difficulties, and indeed now the principal one, that oppoſes the efforts of the chronometer-maker, to make the action of his mechaniſm permanently uniform.

The mechaniſm of the artificial compenſations may be arranged under three diviſions, *viz.* 1ſt, That which applies excluſively to the balance-ſpring; 2dly, That which applies excluſively to the balance itſelf; and, 3dly, That which applies partly to the ſpring and partly to the balance: for the ſake of order, we propoſe to deſcribe the different compenſation-balances agreeably to theſe diviſions, which are alſo nearly agreeable to the order of time in which they were invented.

Compenſations at the Spring.

1. *Harriſon's Compenſation Curb.*—We have ſaid, under our article CHRONOMETER, that Mr. James Harriſon of Barton, in Lincolnſhire, was the firſt perſon who applied a ſelf-compenſating piece of mechaniſm to the balance of a watch, which contrivance, according to his provincial dialect, he called a *kirb*, and which we have taken the liberty to name a *curb*. *Fig.* 1. of *Plate* XXVIII. of *Horology*, repreſents the balance, balance-ſpring, ſmall cocks, and curb, as they would be ſeen by an eye placed directly over the back of the pillar-plate, when the large cock is taken off, that bears the verge-pivot: AA is the plate on which the mechaniſm is placed; B the balance of one uniform metal; C the ſpiral ſpring of regulation; DE the thermometrical curb, ſo contrived as to lengthen the effective length of the ſpring in the different degrees of temperature, without manual adjuſtment; Gg a double cock to which the curb D E is attached; and F the ſmall cock, or ſtud, to which the exterior end of the ſpring is pinned. The thermometrical curb, D E, is compoſed of two long ſlender ſlips, one of braſs and the other of ſteel,

pinned together in different places, and is attached to the ſmaller half *g* of the double cock G *g*, ſo that it may be brought nearer to G, or removed farther from it at pleaſure, before *g* is fixed to G, in order to place it at the requiſite point between *a* and *b* of the ſpiral; the double cock is repreſented in the figure as though it were fixed faſt by a ſcrew and ſteady pin to the plate; but in the original time-keepers, it was adjuſtable between two parallel pieces, that allowed it to approach the ſtud F, or recede from it, for the purpoſe of aſcertaining particularly the beſt length of the curb, for effecting the requiſite compenſation: the ſide of the curb next to D was ſteel, and the ſide next to E braſs, and the effect produced by changes of temperature was thus: when the time-keeper was expoſed to heat, the balance, and balance ſpring, had their dimenſions enlarged, ſo that the momentum of the balance was increaſed, ſuppoſing its arc of vibration unaltered, and the force of the ſpring was diminiſhed, or at leaſt would have been by its elongation, if the curb had not been applied; and the natural conſequence would have been for the piece to retard; but the ſame heat, which naturally produces theſe changes in the balance and balance-ſpring, produces ſuch a change in the ſhape of the curb, as counteracts theſe natural effects; in the caſe of heat, the braſs part, E, of the curb becomes more lengthened than the ſteel part D, by reaſon of its ſuperior expanſibility; the conſequence is, that the compound piece, D E, becomes convex on the braſs ſide E, and concave on the ſteel ſide D; that is, the remote or free end of the curb, conſidered as an index, moves from *a* towards *b*, and as this end carries two pins between which the ſtraight end of the ſpring paſſes, theſe pins, and not the ſtud, form the limit of length at all times of the regulating ſpring, which conſequently is curbed as to its effective length, under all the variety of elongations, that it experiences from different degrees of heat; ſo that it may be ſaid to be always both lengthening and ſhortening in nearly the ſame proportion: on the contrary, when the piece is expoſed to cold, or to ſpeak more ſcientifically, is expoſed to a low temperature, the ſteel ſide, D, becomes convex, and the braſs ſide, E, concave from its greater contraction, and the free end of the curb moves from *b* towards *a*, thereby mechanically lengthening the ſpring, as it naturally contracts, in a degree ſufficient to check the velocity which the balance would acquire from its diminiſhed dimenſions. Thus, whether it is ſummer or winter, in hot or in cold climates, the compenſation-curb is calculated to counterbalance the natural effects of changes of temperature on the dimenſions of the balance and of its regulating ſpring.

It has been aſſerted, that the *elaſticity* of the balance-ſpring is affected by changes of temperature; but we conceive it to be its *force*, or that power which depends on its *length* that is naturally altered, and not, at leaſt in any ſenſible degree, that property which depends upon its *temper*. This contrivance, we have ſaid, in another place, laid the foundation of modern chronometry, though it was afterwards found to be a better application of the compound bar, that the balance itſelf ſhould bear it, in order that the dimenſions of the balance and of the compenſation pieces might be affected in a contemporary manner by the variation of atmoſpheric temperature, ſo that the artificial changes going on in the balance itſelf might compenſate the changes naturally produced in it and in the ſpring, inſtead of the artificial changes in the ſpring being made to compenſate the natural changes in its dimenſions, and in thoſe of the balance. We have before ſaid, that this mechaniſm was invented and uſed ſo long ago as the year 1726, and that it is incapable of the uſual adjuſtment for rate, except at the fixed ſtud, from which the faſtening pin muſt neceſſarily be taken, to admit of the ſpring's being lengthened or ſhortened.

Compenſation by F. Berthoud.

In the year 1760, which was about ſeven years before the Board of Longitude publiſhed the principles of Harriſon's Time-keeper, Mr. F. Berthoud, the famous clock and watch-maker of Paris, contrived and introduced, into No. 1, of his marine clocks, a compenſation-curb, acting on the ſpiral ſpring of the balance in a manner ſimilar to the action of Harriſon's curb, except that the backward and forward motion of his *pince-ſpiral*, or curb, was produced by the difference of two direct expanſions agreeably to the diſpoſition of the grid-iron pendulum, which Harriſon had previouſly invented, (for the deſcription of which ſee the ſection, "Aſtronomical clock, by Mr. Reid of Edinburgh," under the article CLOCK.) The mechaniſm by Berthoud, is repreſented in *fig.* 2. of *Plate* XXVIII., the eye being, as before ſuppoſed, to be directly over the pillar plate of the frame; the circle A A denotes the plate juſt mentioned; B B, the grid-iron frame, attached to the ſaid plate, and compoſed of alternate bars of ſteel and braſs, joined together by end-pieces like the compenſation-pendulum alluded to, which therefore need not be again minutely deſcribed; the pair of braſs bars in the middle of the frame, or grid-iron, are thoſe which act by protruding more or leſs in different degrees of heat againſt the tail-piece D, of the double lever D E, moveable on an arbor with pivots borne by the plate and cock G, or by G made as a double cock; H is the principal cock, in which the balance pivot runs in the triangular hole, made by three friction-rollers, not ſhewn in the figure; the *pince-ſpiral b*, and arm *a* are faſt to an arbor which is pivoted into the cock H, and a ſmall cock under it, which is attached to it; this arbor is parallel to the balance verge, and is ſo contiguous to it, as to be in one of the eccentric points, from which the ſpiral of the ſpring which it holds is geometrically deſcribed; that is, at half the diſtance from the verge, that the two neareſt ſpirals are from each other; on each of theſe two levers, *a* and *b*, is a ſliding piece of metal; that on *a* for the lever E to reſt againſt, and that on *b* to have a ſlit for receiving the thread of the ſpiral ſpring; they are both fixed by preſſing ſcrews to their reſpective levers, when adjuſted to their proper places thereon; but *b* is prolonged to *d*, which is attached to the graduated L piece by the ſcrew *e*, and this L piece has a pointer, uſed as an index for the graduations on the bridge I, that lies acroſs the grid-iron frame, when attached to the plate A A. K is a ſpring, preſſing againſt a tail-piece of the lever *a* to keep it always in contact with the lever E; C is the ſpiral regulating ſpring, as in an ordinary watch, and F an adjuſtable ſtud, for the exterior end of the ſpring, with an oblong perforation for the preſſing ſcrew; the interior end of the ſpring being faſt to a collet on the verge, which is adjuſtable by friction. The mechanical action is thus produced; the difference of the expanſibilities of the ſteel and braſs rods of the grid-iron frame becomes ſenſible at the pin D, in the tail-piece of the bent lever D E, moveable in a point of bridge G, between thoſe two letters; the part E, being longer from the centre of motion than the part D, which is acted on, moves faſter and carries before it the lever *a*, and together with it the *pince-ſpiral b*, and L piece with the ſcrew *e*; and it is obvious, that, as the ſliding piece, borne by lever *a*, limits its effective length from its place of contact with lever F, the relative lengths of theſe two levers may be varied at pleaſure by adjuſtment, till the effect produced on the ſpring by the grid-iron frame, through the medium of theſe levers, is according to its due quantity; and the pince-ſpiral will go and come in a manner ſimilar to the motion of Harriſon's curb, though the law of their motion is different, one depending on direct expanſion, and the other on lateral curvature. The graduations of the L piece are for bringing the machine to time, the end, *d*, being the index, and the ſcrew, *e*, the inſtrument of adjuſtment; and the index of the L piece ſhows, on the graduated cock I, the ſituation of the pince-ſpiral under all the variations of temperature. Beſides No. 1, Nos. 3, and 8 of the marine-pieces of this author had the compenſation we have here deſcribed, which, though complex, would no doubt anſwer its purpoſe as well as Harriſon's more ſimple contrivance; and though the idea did not originate with the contriver, yet it will be acknowledged, that there is evident ingenuity in the arrangement and adaptation of the acting parts of the mechaniſm; the effect alſo produced by the mechaniſm before us muſt be regular and permanent, when the materials are good, and the work well executed. (See "Traité des Horloges Marines" par F. Berthoud. Paris 1773.)

Harriſon's Compenſation improved by F. Berthoud.

After the Board of Longitude had publiſhed the principles of Mr. Harriſon's Time-keeper, Mr. F. Berthoud perceived that Harriſon's compenſation-balance might be improved by introducing the action of a lever, capable of adjuſtment for any given quantity of effect, without moving the cock that holds the compenſation bar; the conſtruction he adopted was thus; A, in *fig.* 3; of the plate already named, is the cock for the balance pivot, ("Hiſtoire de la Meſure du Temps") which balance is not neceſſary to be ſhewn, B is the curb lever, detached from the compenſation bar, and turning on a ſhort arbor pivoted into the cock A, and an under cock borne by this not ſeen, the centre of its motion being at one ſide of the balance verge, as in Berthoud's former balance; the ſpring under the cock, that urges it towards the ſcrew of C, is concealed from ſight; C is the compound or compenſation bar, fixed in the chops of a faſt bridge D, and having, at its free end, a ſcrew with its point bearing on the tail-piece H of the curb-lever B, which curb-lever has a ſliding piece with a narrow groove to admit the thread of the ſpring, and is fixed by a preſſing ſcrew in any given ſituation; E is what the French call a *piton*, or adjuſtable frame of the ſtud, ſtanding on four ſcrews, as feet, which allow it to be brought into the plane of the ſpiral-ſpring, ſo as not to force it from its natural poſition; the ſtud F, that holds the exterior end of the ſpring ſlides in the *piton*, when under adjuſtment for diſtance, and is then fixed by a preſſing ſcrew, paſſing through the contiguous end of the ſpring G, which turns on a ſtud or ſcrew, at its remote end when looſe. The manner in which this mechaniſm acts will be readily apprehended from what we have ſaid of Harriſon's, and the preceding compenſation curb, of which it conſtitutes an union, thus: when the temperature is high, the compound bar, C, is affected exactly in the way we have juſt deſcribed Harriſon's to be affected, and the chops of the bridge, D, allow the lengths of the curb lever B, and of its tail-piece, preſſed by the ſcrew, to be adjuſted according to any given ratio as they reſpect each other; and as the quantity of effect to be produced on the ſpiral ſpring depends upon this ratio, with a given compound bar balance, eſcapement, and maintaining power, it is obvious that the adjuſtment for temperature may be brought to the requiſite degree of exactneſs by a few ſucceſſive trials in the oppoſite extremes of temperature.

The Application of Harriſon's Curb to a common Watch.

After Berthoud had made the alterations, which we have juſt deſcribed, in Harriſon's curb, he turned his mind towards ſimplifying it ſo as to become uſeful in a common watch; the manner in which he ſucceeded in doing this is ſhewn in *fig.* 4 of our preſent plate, where it will appear by inſpection how the action takes place, particularly as we have placed the ſame letters of reference to the ſame parts, as in *fig.* 3; the difference of the two contrivances conſiſts chiefly in the ſtud, F, being here fixed faſt to the circular plate of the frame; in the curb-lever being bent and having its centre of motion on a ſeparate ſmall bridge, H; and in the oppoſing ſpring, K, being attached to the face of the plate itſelf; otherwiſe the adjuſtment for temperature is performed as in *fig.* 3, and is equally capable of taking in the extreme limits of temperature. (For another diſpoſition ſomewhat ſimilar to the preſent one, ſee Berthoud's "Supplement au Traité des Horloges Marines." *Plate* III. *fig.* 8.)

Compenſation by Mr. Alexander Cumming.

Mr. Cumming publiſhed his book on "The Elements of Clock and Watch-work," in the year 1766, in which he has given an ingenious though complex method of compenſating the effects of heat and cold on the balance and balance-ſpring, different from the foregoing ones, and depending on the difference of the direct expanſions of two ſeparate and different metals, aided, like Berthoud's, by the introduction of adjuſtable levers; whether the invention preceded or followed Berthoud's grid-iron frame and lever, is a conſideration which does not, perhaps, affect either of their two claims to originality, as Harriſon's curb was moſt probably heard of, if not previouſly known, by both the mechaniſts in queſtion; nor does it appear that either of the two complex methods here ſpoken of has been copied by others in practice. *Fig.* 1. of *Plate* XXX. of *Horology*, repreſents a view of Cumming's mechaniſm of compenſation, without the balance, as viewed by the eye placed directly above it, when fixed to the back of the pillar-plate of the frame. The outermoſt circular rim, AAA, is of ſteel, and has eleven ſmall rollers revolving on as many pins or ſtuds inſerted into the plane of the rim, and the interior rim, BBB, which reſts againſt the rollers, is of braſs, but is not an entire circle: one end of this interior, or braſs rim, is ſcrewed faſt to the plane of the ſteel rim, by means of its enlarged extremity being made to lie upon the plane of the ſteel rim, as ſhewn in the figure; in this ſituation it is clear that the exceſs of the braſs rim's expanſibility will make its oppoſite ends approach each other in a high temperature, and recede in a low one, while the friction-rollers will prevent jerks; hence any object oppoſed to the free end of the braſs rim will be puſhed forwards by it, as the temperature is raiſed, which effect affords the means of alternately lengthening and ſhortening the ſpiral ſpring of the balance in the following manner; the free end of the braſs rim preſſes againſt the end, *a*, of a lever moveable on a ſtud about the middle of it, and the oblong ſlit made in the oppoſite end of the ſame lever receives a pin inſerted into the contiguous end of a ſecond lever *b*, moveable about its remote end round a ſocket concentric with the balance-verge, or nearly ſo; the lever, *b*, which may be called the curb-lever, has two pins in underneath, not ſeen in the drawing, between which the outermoſt thread of the ſpiral ſpring paſſes; hence it is plain, from an inſpection of the figure, that when the end, *a*, of the ſlit lever is puſhed outwards, its oppoſite end draws inwards the pin of the curb-lever, and with it the curb, ſo as to ſhorten the effective length of the ſpring in this caſe; and on the contrary, when the braſs rim ſhortens by a low temperature, the contrary effect takes place: for the end, *a*, of the ſlit lever follows the free end of the ſaid rim as it retires in contracting, in conſequence of a ſpring, not ſeen, impelling it into contact with this end at all times; the ratio of the two acting ends of the two levers from their reſpective centres of motion is adjuſted by the horizontal arbor, *d*, ſquared at the end to receive a key; for as the interior end of this arbor is formed into a ſcrew that paſſes into a tapped hole in a ſquare nut on which is the centre of motion of the ſlit lever; the ſaid ſquare nut is made to ſlide in an oblong hole of the plate below the lever; and thus the different parts of the ſlit may be made, ſucceſſively, to impel the pin of the curb-lever, as the compenſation may be found on trial to require. The balance, of courſe, is placed above this mechaniſm, and vibrates free from it. We obſerve that in the original drawing given by Cumming, (*fig.* 5 of his *Plate* XIV.) the ſpiral is made to turn the wrong way about, ſo that the effect of heat will be to elongate the ſpring, which conſtruction would double the natural effect of variations of temperature inſtead of compenſating them, as the contrivance is intended to do, and would do, if rightly conſtructed; but we ſee no reaſon to doubt this being as effectual and permanent as any of the foregoing modes of producing a compenſation, when the ſpiral is bent the right way round, as we have placed it.

Berthoud's Compenſation by a Braſs Arch.

Another method of producing a compenſation, different from any of the preceding ones, in its mode of application, comes next under our conſideration, as another production of the French clock and watch maker, whoſe name we have had frequent occaſion to mention with reſpect.

Fig. 5. of *Plate* XXVIII. exhibits the plan of all the eſſential parts of this contrivance, in an intelligible manner; A, as uſual, is the principal cock over the pillar plate; B, the balance of one metal; C, the ſpiral ſpring; D, an arch of braſs with its ends reſting in two ſloping notches filed into the ſteel bar, E, which is fixed by a ſcrew, near E, in the middle, to the plate, ſo that it may be at liberty to yield both ways to the action of increaſed or diminiſhed temperature on its total length; F is, as before, the ſtud to hold the exterior end of the ſpring, while the interior one is faſt to a collet on the balance-verge; G*g*, is a bent lever, with a pin in its ſhort end, *g*, and its long end pointed as an index, to reach to the diviſions, H, made on the plane of the plate, which bears the mechaniſm; the effect is thus produced; the braſs arch, D, is more elongated than the ſtraight ſteel bar, E, with the ſame increaſe of heat; this arch carries a ſmall ſcrew, the head of which is juſt oppoſite the pin, *g*, already mentioned, between which ſcrew and pin the outermoſt coil of the ſpiral ſpring paſſes; now if the ſcrew and pin were made to approach, till they both ſhould touch the ſpring at oppoſite ſides, they would become in place of a curb, and there limit the length of the ſpring that comes into action; on the contrary, if they were made to recede from each other, till the ſpring acted up to the ſtud, F, placed on the plate, they would be ſuperfluous; but when they are placed at ſuch an intermediate diſtance from each other that the ſcrew limits the opening of the ſpiral, and the pin its cloſing, before the part of the ſpring near the ſtud is moved by the motion of the balance, then the natural effective length of the ſpring is controlled, and the pin and ſcrew together become a ſpecies of curb, that limits the effective length of the ſpring from an undiſtinguiſhed point, lying ſomewhere between the ſtud and the ſaid pin and ſcrew; which indiſcriminate point will always be nearer to the ſtud the more the pin and ſcrew are removed from each other, and *vice verſâ*; hence it is eaſy to ſee; that moving the index, G, forwards or backwards, on the graduated portion of a circle, H, will bring the pin, *g*, nearer to, or remove it farther from, the ſcrew head, than a mean diſtance, and will thence affect the rate depending on the effective length of the ſpiral ſpring, with a given balance, maintaining power, and eſcapement; but it is the ſame thing if the index be ſuffered to remain, and the ſcrew be brought nearer to the pin; for the one limits the right hand and the other the left hand excurſion of the balance; this is the preciſe operation of the contrivance; the ſuperior elongation of the braſs arch over the ſteel bar ſhortens the radius of curvature of the arch, and makes the ſcrew-head approach the ſpring, more or leſs, agreeably to the change of temperature, to which the acting parts are expoſed. The law by which the approach is effected is ſomewhat different, however, from that by which an expanſion-rim is guided, with one of its ends at liberty; and the manner alſo in which the effective length of the ſpring is limited, allows a long ſcale of lengths, in a correſponding ſhort ſcale of diſtances between the ſcrew head and pin; the latter of which laws is evidently diſadvantageous to the nicety of the adjuſtment for temperature; beſides, when the braſs arch and the ſteel bar are found on trial not to be in their due proportions to each other, the remedy cannot be applied without varying the original proportions, by lengthening or ſhortening the verſed ſine, as the caſe may be, which alteration will require the mechaniſm to be diſplaced.

Improvement on the laſt Compenſation.

Berthoud, having diſcovered the inconvenience and objections to the laſt deſcribed compenſation curb, propoſes another in his "Hiſtoire du Temps," tom. ii. p. 101 and 102, thus: A, *fig.* 6, *Plate* XXVIII, is the principal cock, mounted as uſual on the pillar plate behind; B is again the balance of one metal; C, the uſual ſpiral ſpring; D *d b*, a rack moveable on a ſocket concentric with the balance verge, with ſome additional apparatus carried by it; E is a ſecond cock; and F a third, bearing the *piton*, or ſliding ſtud, with its frame and ſecuring ſpring as in *fig.* 3 of the ſame plate already deſcribed; G is a pinion with an arbor ſquared at the projecting end, to receive a key, which pinion has its teeth formed ſuitable to impel the teeth of the rack D *d*; *a* and *b* are two compound bars of braſs and ſteel, ſoldered together with hard ſolder, inſerted at *d* into a bearing piece, and kept faſt by a preſſing ſcrew *e*, urging them together with the looſe piece, *d*, interpoſed, and kept parallel by a clamping piece *c*; the rack has a circular perforated groove, which allows it to paſs backward and forward by the action of the pinion, while the heads of the two ſcrews, *f* and *g*, confine it to the ſame plane on the back of the plate; and, laſtly, the compound bars, *a* and *b*, have each a pin at their free extremities, which contain between them the laſt coil of the ſpiral ſpring, the action of which is limited preciſely in the manner deſcribed in our laſt compenſation mechaniſm; here, however, the law of flexure is again the ſame as in Harriſon's, though the law of limitation in the effective length of the ſpring is different: the latter, as we have ſeen, depends on the quantum of play between the pins, whereas, in the former, there was no play at all, and the curb itſelf was the limit; ſeeing the effective length of the ſpring diminiſhes as the pins approach each other, the exterior laminæ of the compound bars, *a* and *b*, muſt neceſſarily be braſs, and the interior ones ſteel, to ſhorten the ſpring in high temperatures, and the contrary; when the effect produced is too great, the clamping piece, *c*, is carried outwards towards the pins, in order to ſhorten the bars, which have their lengths meaſured from this clamp; but when the effect produced is too little, the ſaid clamp muſt be brought inwards towards *d*, to lengthen the bars ; ſo that the ſcale of adjuſtments here runs along the length of the two parallel compound bars, as it relates to the variations of temperature ; while the adjuſtment for a mean rate is made by the index *b*, which ſhews the quantum on the contiguous portion of a divided circle. Still, we think, that while a ſmall variation in the play, between the curbing pins, produces a great variation in the effective length of the ſpring ; this contrivance can have no pretenſions to rank in utility with ſome of the more recent inventions, that place the compenſating parts on the balance itſelf.

Compenſation by Breguet.

A compenſation ſimilar in effect to the two foregoing ones by Berthoud, but more ſimple than the latter, is that which Breguet of Paris has applied with ſucceſs to his common watches ; this compenſation is ſhewn in *fig.* 7 of *Plate* XXVIII. where the bounding circle denotes the back plate of the frame ; A the principal cock ; B the balance of one metal ; C the common ſpiral ſpring ; D *d c* a three armed piece, called by the French a *rateau*, to which is attached the mechaniſm of compenſation thus : the curvilinear fork, *a b*, is compoſed of two metals : each prong conſiſting of a ſlip of ſteel and a ſlip of braſs, ſo attached together, that the ſteel is the exterior, and the braſs the interior part in each ; the end *a* is ſcrewed to the lever D, and the end *b* is looſe, conſequently at liberty to approach or recede from the ſpiral ſpring, as the changes of temperature affect the fork ; the interior end, *a*, of the fork bears a pin near the letter *b*, not ſeen by reaſon of the lever D, which lies over it, and a ſecond pin ſimilar to the other is carried by the lever D, between the two largeſt coils of the ſpiral : theſe two pins limit the effective length of the ſpring exactly in the way that the two preceding compenſating contrivances have been explained to do, for which reaſon we do not repeat what we have already ſaid on this part of the ſubject ; the alternate inward and outward motions of the pin, *b*, regulate the diſtance between the two pins, on which the play depends, and conſequently the length of the ſpring alſo, as it has regard to the action ; the prong *a* has a tendency to become ſtraight by heat, in conſequence of the concave part being braſs, but the prong, *b*, has a tendency to become ſtill more convex in conſequence of the braſs being the convex part ; the joint effect of which alterations of ſhape and poſition will be, that, as the balance and its ſpring become enlarged, the ſpace between the curbing pins will become diminiſhed, and the contrary. The watch is regulated for mean time by the index part *d* of the three-armed *rateau*, and the third arm, *c*, contains a pin about the middle of the ſpiral ſpring, which we conceive to be the banking pin, though no mention is made of it in the original deſcription. " Hiſtoire de la Meſure du Temps, by Berthoud."

Compenſation by Mr. James Scott.

In May of the year 1805, Mr. James Scott, of Grafton Street, Dublin, publiſhed an account in Mr. Nicholſon's Journal, (vol. XI. p. 19—21., 8vo. ſeries) of a compenſation curb which acts in a manner ſomewhat analogous to that which we have deſcribed as the invention of Cumming ; but it is evident he had not previouſly ſeen the one alluded to, nor yet Berthoud's, otherwiſe he would not have ſaid in his letter to Mr. Nicholſon, that " artiſts have not been able to invent a compenſation-curb adjuſtable to the exact expanſion required." The contrivance now before us is ingenious, and we preſume might be applied to an ordinary watch with conſiderable advantage ; though we cannot perſuade ourſelves that any method of curbing the regulating ſpring, after it has been adjuſted for iſochroniſm, affords ſo good a compenſation, as the mechaniſm of compenſation now uſually applied to the balance itſelf. *Fig.* 2. of *Plate* XXX of *Horology*, ſhews all the parts of Mr. Scott's compenſation-curb, as given by himſelf in the original account ; but as his deſcription did not ſeem very intelligible to us at the firſt reading, we hope to be excuſed the liberty we take of giving our own account of the contrivance : A A is an index of ſteel, with a circular part embracing a dove-tailed groove that ſurrounds the balance verge in the upper plate of the frame ; to this ſteel index is attached, by a ſcrew and ſteady pin, one end of a compound circular bar, B B, ſo formed, that the ſteel part is the exterior, and the braſs part the interior ; to this compound bar is faſtened a ſecond compound bar C C, alſo circular, by means of a clamping piece and ſcrew at D ; a looſe piece of metal, interpoſed between the two circular bars, being preſſed by the ſcrew, the outer one keeps the inner one cloſe to the ſhoulder of the clamping piece, which cannot be ſeen in the figure ; but it is eaſy to conceive that ſuch a clamping piece will apply at any part of the circular bars ; the bar, C C, has the braſs part exterior, and the ſteel part interior ; E is the ſtud in the plate, that holds the outward end of the ſpiral regulating ſpring, intended to be curbed ; and the interior compound bar, C C, paſſes between two ſteady pins, inſerted in the plate at *a*, a ſhort diſtance from *b*, where the curbing pins are fixed, that embrace the laſt coil of the ſpring : whenever the index, A A, is moved, in regulating for mean time, it carries with it the two concentric compound bars, and the curbing pins ſlide along the coil of the ſpring, ſo as to lengthen or ſhorten it as the caſe may be ; ſuppoſe, now, that the regulation for rate be made, and that the balance has its temperature elevated, the tendency of the outer circular bar will be to open, or enlarge its radius of curvature, which action will bring the interior compound bar and its curbing pins nearer to the index, and ſhorten the balance ſpring a little ; but this action is not ſufficient to produce the whole requiſite effect ; the tendency of the interior circular bar C C, on the contrary, is to cloſe, that is, to approach the index, in conſequence of its radius of curvature becoming ſhorter, while its end at D is clamped to the free end of B B ; and it is the amount of theſe two contemporary motions, produced in the interior compound bar, C C, that conſtitutes the motion of the curbing pins at *b*, along the ſpiral ſpring, in a direction towards the index A A. In a low temperature, juſt the reverſe takes place ; the outer compound bar, B B, has its radius of curvature ſhortened, and the inner one, C C, has its radius of curvature, on the contrary, lengthened in this caſe, ſo that the joint effect is to make the curbing pins retire from the index to lengthen the regulating ſpring ; which alternate lengthening and ſhortening of the balance-ſpring's effective length in heat and cold, form the compenſation for the correſponding variations in the momentum of the balance and force of the ſpring. The excellence of the preſent contrivance conſiſts in its affording a ſcale of adjuſtments ; for moving the clamping piece, D, forwards, towards the middle of the concentric circular bars of compenſation, leſſens the effect, and removing them back, towards the open ends, increaſes the effect to be produced on the balance-ſpring, by giving a greater or ſmaller range of motion to the curbing pins. The inventor's rule for the thickneſs of the compound bars is, that each lamina be of the thickneſs of an ordinary main ſpring of a common watch, ſo that the compound pieces may be each of twice the ſaid thickneſs.

COMPENSATIONS *on the Balance.—Thermometer of Peter le Roy.*

We have ſaid under our article CHRONOMETER, that Harriſon was the firſt perſon who ſuggeſted the idea of the balance carrying its own compenſation, and Peter le Roy was the firſt who in 1766 ſucceeded in ſuch a conſtruction; in our notice of this invention, however, there is a typographical omiſſion which we beg leave to correct here before we proceed to our deſcription; it is ſaid under the article juſt referred to, that the compenſation was effected "by means of two thermometers, one of mercury and the other of alcohol, attached to, and carried by, the balance itſelf;" inſtead of "one end of each bearing mercury, and the other end alcohol, &c." as will now be more clearly underſtood. *Figs.* 1 and 2 of *Plate* XIX. of *Horology*, exhibit ſo much of the balance of Peter le Roy as is neceſſary for explaining its conſtruction; A A, in *fig.* 1, is a portion of the arbor or verge to which the balance B is attached by ſcrews; C is a ſmall ring attached to the inferior part of the verge which holds the two ſcrews of regulation for mean time, and which alſo clamps the horizontal parts of the two glaſs thermometrical bent tubes, D and E, placed diametrically oppoſite to each other, one of which is ſeen in a detached ſtate in *fig.* 2; theſe tubes are alſo held faſt by two other clamps, to the middle of the verge, as may be ſeen in *fig.* 1; the ſuperior end of the ſtraight vertical part of each tube is open to admit the preſſure of the atmoſphere on the mercury, which is now ſeen ſtanding at the ſame level in both the upright portions of each thermometer, after the inferior or horizontal connecting part is filled; but the bulbs and parts above the letters D, and E, are filled at a mean temperature with alcohol, reſpectively reſting on the columns of mercury: when the balance and balance-ſpring are enlarged by heat, the alcohol has alſo its bulk increaſed, and deſcends below the letters D and E, for inſtance, in very high temperatures as low as the horizontal connecting part, in which caſe the mercury preſſed upon by it deſcends under the alcohol, but aſcends in the ſame proportion at the other end, till it reaches nearly the open ſuperior end of the vertical ſtraight part of the tubes reſpectively; the mercury which was before in a column parallel to the verge, but at a diſtance from it, is now alſo parallel but contiguous, and, as it is a ponderous fluid, the momentum of the balance is conſiderably diminiſhed by the approach of the mercury to the centre of motion, which change of poſition of the mercury conſtitutes the compenſation required to balance the effect of an enlargement of the balance itſelf, and of an elongation of its regulating ſpring taken jointly: in a low temperature the contrary change takes place in the ſituation of the mercury, for as the bulk of the alcohol contracts and retires round the acute angular point into the bulb, the exterior vertical branch becomes filled by the mercury. Peter le Roy, we have before ſaid, was diſpoſed to prefer this balance to the balances he made entirely of metal, but the frangibility of the bent tubes, and the liability of the fluids to be agitated, if not to be mixed, ſometimes conſtituted objections to its portability, that prevented its being copied by other chronometer makers. The adjuſtment for the extremes of temperature muſt have been made by varying the quantity of mercury in a given tube; and probably tubes of various dimenſions were tried ſucceſſively before the exact effect was produced, both at the extremes, and at all the intermediate degrees of temperature. The balance being heavy, was ſuſpended by a thread above the ſuperior end, A, and the ſlender cylindrical part, underneath the ſame A, rotated in a triangular hole, made by three ſurrounding friction rollers, not ſhewn in our figure; laſtly, two regulating ſprings, wound in contrary directions, were placed under the ring, C, near the lower pivot of the verge, which ſprings are purpoſely left out, that the reader may not have to view more parts than are neceſſary for explaining the compenſation balance itſelf.

Compound metallic Balance of P. le Roy.

Peter le Roy, however, was not content with trying his thermometrical tubes, only to effect a compenſation on the balance, but he ſo far adopted Harriſon's idea on the requiſite conſtruction of a balance, carrying its own compenſation in motion, that he tried moreover his compound bars of ſteel and braſs, not, indeed, as curbs, applied to the ſprings according to Harriſon's method, but as rims to the balance itſelf: *fig.* 3 of *Plate* XXIX. ſhews a balance of this contrivance, where A is the diametrical bar fixed to the verge, and BB and C C two ſeparate ſemicircular portions of the compound rim, which were each compoſed of laminæ of ſteel and braſs reſpectively rivetted together in different places, in ſuch a way that the braſs pieces were the exterior or concave ones, and the ſteel pieces the interior or convex ones; the loads are not given in the drawing, but the inventor ſays "Memoire ſur la meillure maniere, &c." that his contrivance made a conſiderable portion of the circumference to approach the centre of the balance in a high temperature; ſo that either he muſt have had loads on the ends of the ſemicircular parts of the rim, or otherwiſe theſe parts themſelves muſt have been thick, which would prevent their due obedience to the variations of temperature. *Fig.* 4 is a kind of regiſter contrived to examine the law by which the flexure of a compound bar was guided, as compared with a mercurial thermometer, thus; A is the croſſes and rim of a balance of one metal, ſteel, we will ſuppoſe, and the compound piece B, ſcrewed at the end *a*, to the plane of the rim, has its end, *b*, at liberty to obey the changes of temperature; near *b* is a ſmall cock into which a roller, bearing the index C, is pivoted above, againſt which roller the free end, *b*, of the compound bar, B, acts, whilſt the interior end of the index points at the diviſions made on the portion of a circle, D, near the centre of the balance: the experiments that were made with this inſtrument, according to P. le Roy's account, ſhewed that the rim of the index, ſo circumſtanced, correſponded very well with the rim of a mercurial thermometer, in all the different parts of the ſcale; and if this was found to be really the caſe, we cannot help thinking it extraordinary that the contriver of the compound metallic balance, which has ſtability and portability to recommend it, did not prefer it, in actual practice, to the mercurial balance, which was liable to the objections we have ſtated.

Arnold's Balances.

Some pains have been taken to prove that Mr. Arnold, ſenior, did not invent his compenſation balances himſelf, but borrowed them from Peter le Roy; we confeſs that we have not met with any concluſive argument in favour of ſuch a ſuppoſition, but, on the contrary, have aſſerted under our article CHRONOMETER, that, "a variety of different ſhapes were given by Arnold to his balances, and actually tried in practice, before he adopted the one in preſent uſe, ſome of which balances are yet in exiſtence;" and we have it now in our power to ſay further, that many of the balances here alluded to are yet in uſe, as ourſelves have witneſſed very lately; which balances have been proved to be excellent regulators, and ſome of which have public teſtimonies in their favour. We propoſe therefore now to deſcribe them in ſucceſſion, or at leaſt ſuch of them as have fallen in our way.

No. 1. In his preface to his printed certificates, Mr. Arnold, ſenior, ſays, that his firſt attempt to improve clocks and watches commenced in the year 1764; but we find it was not till the year 1767, that he turned his mind ſeriouſly to the conſtruction of chronometers; the firſt compenſation balance that he actually brought into uſe, was the one repreſented in *fig.* 5. of *Plate* XXIX. which was taken from one of the original balances while in our poſſeſſion. The rim is 2.4 inches in diameter, and is, together with the three radial arms, of ſlender braſs: the compenſation bar is of braſs and ſteel coiled round the balance verge, at a little diſtance from the mechaniſm which lies between it and the plane of the balance; the exterior part of this compound ſpiral bar is braſs, and the interior part ſteel; *a b* is a piece of ſteel moveable round a tube ſurrounding the balance verge, and having a longitudinal aperture or ſlit, each way from the centre to nearly each extremity, *a* and *b* reſpectively; the end, *a*, is turned up a little, and has the exterior end of the compound ſpiral bar of compenſation attached to it, ſo as to partake of its motion under all the changes of temperature; *c d* and *c d* are two bracket pieces of metal carrying each a pin under them, that exactly fit the longitudinal ſlit of the piece, *a b*; conſequently theſe bracket pieces alſo partake of the motion produced by the compound ſpiral bar; the ends, *c* and *c*, of the bracket pieces are attached to the balance rims at the points, *e* and *e*, by the ſtraight ſlender ſprings, *e c*, and *e c*, reſpectively; to the ends *d* and *d*, of the ſaid brackets are attached the long pins, *d f* and *d f*, which paſs through the ſmall ſteady bridges on the rim, and carry the ſectoral loads of temperature, *f* and *f*; the action produced on this mechaniſm by the changes of temperature may be thus explained; when the temperature is elevated, the exterior end of the compenſation ſpiral bar, moves in a direction from *a* towards *c*, and carries with it the end, *a*, of the croſs-piece, *a b*, at the ſame time the oppoſite end of this piece moves from *b* towards the *c* which is contiguous to it; theſe oppoſite motions of the ends, *a* and *b*, of the croſs piece carry the two brackets in ſuch direction that the loads of temperature, *f* and *f*, are both made to approach the balance, ſo as to leſſen its momentum when in motion; which is the effect required in the above-named temperature; on the contrary, when the temperature is low, the motion of the ends, *a* and *b*, is towards *d* and *d* reſpectively, and the loads of temperature are thrown outwards, to increaſe the momentum of the moving balance. The quantum of effect is regulated by enlarging or diminiſhing the loads, *f*, *f*, of temperature, as compared with the ſcrews, *g* and *g*, or weights of adjuſtment for mean time; or otherwiſe, by ſcrewing them into a new ſituation, out or in, as the caſe may be; the ſprings, *e c* and *e c*, do not interfere with the inward and outward motions of the loads of temperature, but only confine the brackets to the plane of their action, and limit the direction of their motion. This compenſation-balance was applied to ten or twelve different chronometers, between the years 1775 and 1778, but we have not been able to aſcertain its comparative merit; its principle is ſimple, in that there is but one compound bar, to move two loads of temperature, but its mechaniſm is complex, which was probably the principal reaſon why it came into diſuſe.

No. 2. The next balance, which Mr. Arnold contrived, was that which is repreſented in *fig.* 6. of *Plate* XXIX, in which the mechaniſm is much more ſimple than in its predeceſſor; the rim and diametrical bar, by which it is attached to the verge-collet, are both ſteel, the parallel bars, *a b* and *a b*, are compoſed of braſs and ſteel reſpectively, the braſs being here interior and the ſteel exterior, and are inſerted into pivot-holes made in the rim of the balance; in ſome of the chronometers, the end, *b*, was faſt to the balance, and the end, *a*, of the ſame bar looſe, while the end, *a*, of the other bar was faſt, and the end, *b*, of the ſame was looſe, but in other chronometers both the ends of each bar were formed into pivots with ſhoulders, and were inſerted looſely by bending the bars about the middle; the croſs pieces, *c* and *c*, which carry the loads of temperature, are of ſteel, and the rim itſelf is ſo notched as to admit of the loads being contiguous, that they may meet with very little reſiſtance from the air, when in motion; the mode of action is obvious from a view of the figure, and from what has been previouſly ſaid of a ſtraight compound bar, being liable to become convex on the braſs ſide by an elevated temperature, and the reverſe in an oppoſite temperature; the bars, *a b* and *a b*, becoming convex, with increaſed heat, towards the centre of the balance, draw the loads, *d* and *d*, nearer to the rim, than they are when the bars are ſtraight at a mean temperature, and, on the contrary, as the heat diminiſhes, the ſame parallel bars become convex on the ſides next the rim, and carry the loads from the balance; and theſe alternations of motion, keeping pace with the changes made in the dimenſions of the balance itſelf and of the balance-ſpring, conſtitute the compenſation for the effects of temperature: the exact quantum of effect is adjuſted as before, by altering the magnitude of the loads, *d* and *d*, as compared with the weights of the adjuſtment-ſcrews, *e* and *e*, for mean time; or otherwiſe have their relative poſitions altered in regard to their diſtances from the centre. About twenty of theſe balances were made and applied as regulators, all of which performed their office, we are told, very well; the famous gold chronometer, No. 36, tried for 18 months by Dr. Maſkelyne, at the Royal Obſervatory, while worn in the pocket, under the different degrees of temperature, agitations of the body, and changes of poſition, had, and ſtill has, one of theſe balances; and its rate, which has been publiſhed, eſtabliſhed its credit ſo highly, that it was ſold for 1000 *l.* or guineas, notwithſtanding the detent of its eſcapement, after the faſhion adopted by the French, is fixed to an arbor revolving on pivots. The balances of the preſent conſtruction were made from the year 1778 to the year 1780, and the only objection we have heard alleged againſt them, was the play they neceſſarily had in their pivot-holes, which we think muſt have been ſcarcely perceptible when the pivots were well made and fitted tight into their holes.

No. 3. The objection to the motion at the pivot holes in the laſt balance, (No. 2.) was attempted to be remedied by the conſtruction exhibited in *fig.* 7. of the ſame plate, where the expanſion pieces are of braſs and ſteel, arranged in the form of a long S, which form was afterwards adopted by Emery, the Swiſs watch-maker, who ſettled in London, and who has been the reputed inventor of this arrangement; the two halves of the S are joined at the middle, and the braſs, as before, is interior throughout; the rim and diametrical bar of ſteel, in the balance we examined, which was 1.2 inches only in diameter, by reaſon of its having been uſed in a pocket-chronometer; the exterior end, *a*, of the S is attached to one of the ſhortened croſſes of the balance, and the interior end of the ſame bears the long pins, *c* and *c*, that carry the loads of compenſation *d* and *d*; the long pins, *c* and *c*, do not paſs through the rim, but are held to their proper poſitions by the two ſlender ſprings, *e c* and *e c*, as in No. 1, or *fig.* 5: as before, the relative weights of the loads of compenſation, *d*, *d*, and *f*, *f*, the loads of adjuſtment for mean time, conſtitute the limit of effect to be produced by the expanſion bars, ſuppoſing their diſtances from the centre fixed; but if the loads remain unaltered, the effect to be produced may be adjuſted by varying the diſtances of the ſcrews reſpectively as they regard the centre of the balance. Of theſe balances about forty were made and applied to uſe between the years 1779 and 1782, and have been found to perform well.

No. 4. The length of the S pieces in the laſt balance having been found difficult to execute of uniform thickneſs and ſhape, by reaſon of their great length, the conſtruction repreſented by *fig.* 8. was ſubſtituted, which is very nearly allied to its predeceſſor, and indeed differs from it only as the bends are united by an interpoſed piece of ſolid metal, thereby dividing what was before one half of the S, into two parallel compound bars; in all other reſpects, the deſcription juſt given of No. 3, together with the letters of reference, will equally apply to our preſent balance; which circumſtance renders a further detail ſuperfluous.

Of theſe balances not more than ſix or eight were conſtructed, by reaſon of the more ſimple form, which is now in general uſe, having been adopted in 1782, when a patent was taken out for it. The ſpecification, however, contains the drawings of Nos. 2 and 3 (*figs.* 6 and 7), as well as of the common balance, which we have fully deſcribed under our article CHRONOMETER, to which the reader is reſpectfully referred, and which was known to the workmen by the name of the Z balance, by way of diſtinction from the S balance. Beſides the above-deſcribed conſtructions of the compenſation balance, Arnold, we are aſſured, contrived various others which never came into uſe, one of which had the expanſion pieces parallel to the verge of the balance, and borne by it; and others had platina in the expanſion pieces, inſtead of ſteel; but we conceive it to be unneceſſary to purſue the ſubject of his inventions further, than merely to obſerve, that ſo regular a ſucceſſion of different balances actually made and uſed, where ſo many were conſtructed, and where each was evidently meant to be an improvement on the laſt preceding, may be taken, if not as a poſitive, at leaſt as a preſumptive proof, that the imputation of plagiariſm, unleſs otherwiſe fairly made out againſt him, is in contradiction to the facts we have here adduced; which are all facts open to ſtill further inveſtigation.

For the deſcription of the compenſation-balance as made by the Brockbanks and Earnſhaw, the reader is deſired to turn to the article CHRONOMETER, where this part of our preſent article has been anticipated. The deſcription of Earnſhaw's balance and eſcapement, however, which we have quoted as the production of this chronometer-maker, it may be proper to ſtate, was not his, but the production of Mr. Firminger, the late aſſiſtant of Dr. Maſkelyne at the Royal Obſervatory, as we have been aſſured by the author himſelf, ſince the publication of the pamphlet in which it appeared oſtenſibly as Mr. Earnſhaw's own account. And now that we are on the ſubject of Mr. Earnſhaw's balance and eſcapement, we beg leave to add further here, an acknowledgment of our miſinformation reſpecting the patent, which we were credibly informed, and ſaid, was never taken out; but which we now find, on more minute examination, was actually taken out and regiſtered. How far his pretenſions to originality of invention are warranted by his conſtruction, is not the object of our preſent enquiry.

A Compenſation balance by F. Berthoud.

Berthoud informs us, "Hiſt. de la Meſure, &c." p. 104 tom. ii., that he had propoſed a means of compenſation by the balance itſelf, ſo long ago as in the year 1754; but that it was not until 1787 that he effected his purpoſe. The reader is led to ſuppoſe, that he was not indebted to P. le Roy, or any other maker, for the contrivance, but that it was the reſult of his own inventive genius; and that the contrivance was his own is rendered ſomewhat probable from this conſideration, that in his "Traité des Horologes Marines," two balls only were propoſed to be uſed with two compound bars; but after a calculation of the effect to be produced, contained in page 195 of the Supplement, four balls were found to be neceſſary with as many compenſating bars. The propoſed arrangement is ſhewn in *fig.* 9. of plate XXIX, and is certainly original; A, A, A, and A are four radial bars of metal attached to the verge collet of the balance by two ſcrews, as ſeen in the figure; the ſlender bars, *a*, *a*, *a*, and *a*, attached reſpectively to the exterior ends of the four radial bars by ſcrews and fixing pieces, are four compound bars of ſteel and braſs, the exterior laminæ being of braſs; and each of thoſe compound bars has at its free end a ſtem formed into a ſcrew, upon each of which a ball, B, with a long ſocket, ſcrews towards or from the verge, to adjuſt the momentum to the maintaining power, and regulating ſpring, and alſo to effect the equilibrium, when the machine is brought to time. From what we have repeatedly ſaid of the flexure of a compound bar, it is eaſy to ſee, that the braſs portions being exterior, will cauſe the balls to approach the centre of motion in hot weather, and the reverſe in cold; which effect conſtitutes the compenſation. The author acknowledges that the exact effect to be produced depends on the relative length and thickneſs of each compound bar, and that many trials are neceſſary to come at the due proportion; conſequently, the want of an adjuſtment for temperature, after the balance is tried, is in this conſtruction a fundamental objection to its general adoption; otherwiſe we ſee no reaſon to doubt its accuracy of performance.

This balance was uſed in No. 8. of Berthoud's marine pieces.

Another Compenſation-balance by F. Berthoud.

The compenſation-balance which we have juſt deſcribed being found liable to objection, the ſame author contrived and uſed, in his No. 63, a different arrangement of the compenſation bars, which he again reduced to two, and introduced two additional ſcrews for adjuſtment of mean time, placed at right angles to the former; the contrivance is ſhewn in perſpective in *fig.* 10. of *Plate* XXIX., where all the eſſential parts may be viewed at once: A A is the balance, made light and of the beſt braſs, having four croſſes; B and B are the two compenſation bars fixed to the rim of the balance at one end, and bearing the ſcrews or weights of temperature, C and C, at the other reſpectively; and D and D are the ſcrews or weights of adjuſtment for mean time, borne by two of the oppoſite croſſes, as ſhewn diſtinctly in the figure. The balance as uſual is attached to the verge collet by a couple of ſmall ſcrews; the exterior laminæ of the two compound bars, B and B, are of braſs, and the interior ones of ſteel, ſo that a high temperature brings them towards the centre of motion, as the balance itſelf enlarges, and as its ſpring elongates and becomes weaker. The adjuſtment for temperature may be made in two ways; either by altering the relative ſizes of the ſcrews of temperature and ſcrews of mean time; or otherwiſe, which is more readily done, by ſcrewing one pair in and the other out, ſo as to produce a ſimilar effect without taking either of the pairs entirely out; it is hardly neceſſary to explain that, in all the conſtructions, when the momentum of the balance conſiſts more of the moving weights of temperature, than of the moving weights of mean time, the effect of the compenſation bars will be the greater in the ſame proportion, and the contrary; ſtill, however, the quantity of flexure of the compound bars in the preſent balance remains unaltered, and conſequently the velocity of their inward and outward motions is not capable of adjuſtment in any other way, than by altering the ratio of their length to their thickneſs reſpectively, which may be called an alteration rather than an adjuſtment.

Compenſation balance by Joſias Emery.

We have ſaid, under our article Chronometer, that Emery's balance is one of the varieties previouſly contructed by the ſenior Arnold, (ſee his N° 3.) and the reader will now judge for himſelf how far our aſſertion was founded in fact. We take our drawing from Berthoud's figure of Emery's balance, which Sarron took over into France, and which was much admired for the accuracy and permanency of its regulation. *Fig.* 11 of *Plate* XXIX, preſents the plane of Emery's balance to the eye placed over it; A A is the balance made with four croſſes, the rim of which is braſs; B B is a ſteel flat ring ſcrewed to two of the croſſes; C and C are the two compenſation bars, each bent twice over into the ſhape of a long narrow S; D and D are the weights for mean time, formed into adjuſting ſcrews to ſuit the female ſcrews of the protuberances made on the plane of the balance; the ſcrews, E and E, are the adjuſtable weights for temperature, but are tapped only at the parts neareſt their heads; the points being faſt to the exterior ends of the compound bars, and the intermediate pins being without threads and moving ſteadily in the two ſockets reſpectively fixed to the rims, or rather formed out of them in the ſolid; the S pieces have the braſs laminæ as uſual on the exterior ſides, ſo that at the middle of the S of each compound bar, the poſition begins to be reverſed, in order that the condition may be fulfilled; the interior end of each compound bar preſſes againſt the circumference of the ſteel ring B B, which we have ſaid is faſt to two of the croſſes; conſequently, whenever a change takes place in the temperature of the parts, the whole motion takes place at the foot of the ſcrew of temperature, at each oppoſite ſide of the balance. The ſmall interior circle F is the upper end of the cylindrical ſpring of the balance, together with the pin that holds one end of it, and the part that forms the banking, which have nothing to do with the compenſation. In this balance, as in Berthoud's latter one, the adjuſtment for temperature muſt neceſſarily be made, by altering the relative momenta of the ſcrews of mean time, and of the ſcrews of temperature.

Mr. W. Hardy's Compenſation-balance.

Among the moſt recent improvements in chronometry, may juſtly be reckoned the new compenſation-balance of Mr. W. Hardy of Clerkenwell, communicated to the Society of Arts in the Adelphi, in March 1805, and renumerated with thirty guineas. The balance in common uſe, that brings the weights of temperature alternately towards and from the verge, by ſimple flexure of the compound rim-pieces, is objectionable, in the opinion of Mr. Hardy and others, on account of theſe conſiderations: 1ſt, The two metals of the compound pieces of the rim, when united by fuſion of the braſs, are liable to partial ſeparations, which affect the permanency of the adjuſtment for temperature; 2dly, The variation of the centrifugal force of the weights of temperature in large and ſmall arcs of vibration overpower the elaſticity of the expanſion pieces, and affect the momentum of the balance, as adjuſted for mean arcs of vibration; the weights being thrown from the centre more in the long arcs than in the ſhort ones; and, 3dly, The adjuſtments for rate and temperature, however carefully made, will affect the equilibrium of the balance, and the rate of the machine placed in different poſitions, without ſubſequent rectifications; to remove theſe objections, Mr. Hardy has availed himſelf of the direct expanſion of two different metals, where their difference of expanſion produces a mechanical action on the loads of temperature, ſuch as bids fair for general introduction in practice.

Fig. 3. of *Plate* XXX. of *Horology*, exhibits a lateral view of the balance before us, and *fig.* 4. the balance inverted; A A is the balance arbor or verge of the ordinary conſtruction; B B is a ſteel diametrical bar, borne by the collet of the verge, 1.6 in. long, 0.232 broad, and 0.032 thick; this ſteel bar is made uniformly except at the two extremities, which are made narrow, and in each of which a notch is cut in the inferior ſurface, ſo far, that the remaining thin metal conſtitutes a ſpring above each notch; beyond theſe ſprings, which we have ſaid form a part of each end of the diametrical bar of the balance, are attached two ſtems at right angles, ſo as to be parallel to the verge when the ſmall ſprings are not acted on by any force; the upper parts of the ſtems, in the original drawing, are formed into ſcrews with threads adapted to the tapped holes of the two balls C, C, which they ſupport, and which are weights of adjuſtment for temperature, but in our more recent drawing, the weights ſlide and are fixed by ſide ſcrews; D, D, are two ſimilar ſcrews for rate which ſcrew reſpectively into the inferior or thicker parts of the ſtems, ſo as to be capable of increaſing or diminiſhing the effective momentum of the balance according to circumſtances; and E, E, are ſcrews of adjuſtment for equilibrium; each end of the ſteel diametrical bar has, moreover, a ſtud or ſhoulder, pointing downwards under the ſtem juſt deſcribed, which ſtud cannot be ſeen in the figure in a ſeparate ſtate; underneath the ſteel bar, and exactly parallel to it and to each other, are placed two bars of braſs, ſhorter but broader than the ſteel bar; the length of each is 1.47 in, the breadth 0.078, and the thickneſs 0.032, like that of the ſteel; each of the two braſs bars has one of its ends ſecured to one of the ſtuds deſcribed, and preſſing with its oppoſite end againſt the other, but in ſuch a way, that their poſitions are reverſed with reſpect to the fixing of the ends; the fixed end of the one being contiguous to the free end of the other reciprocally; a ſecond view is given of theſe bars in *fig.* 4, where they are repreſented in an inverted ſtate. The action of the mechaniſm it is not difficult to underſtand, though the author has rendered his account ſomewhat confuſed by his mention of ſhort levers, which the reader does not ſee in the figure. When the balance is expoſed to heat, the ſteel bar elongates a little both ways from the verge in the centre, but the two braſs bars ſeparately elongate more, and conſequently each detached end, having liberty to move a quantity equal to the difference of the two expanſions, puſhes againſt the ſtud or ſhoulder that is contiguous, and forces it outwards; the ſlender ſpring-parts, above the notches of the ſteel bars, now yield to the forces impreſſed reſpectively on the ſtuds, and the parts of the two ſprings which yield moſt may be conſidered as centres of motion of a pair of levers; the diſtance from the yielding point of each ſpring to the point urged by the detached end of its braſs bar, may be called the length of the ſhort end of each lever, and the diſtance from the ſaid point of each ſpring to the centre of the load carried by the neareſt ſtem, may be taken as the length of the long end of the lever, which two ends ſuppoſe as 1 to 20 reſpectively; then if the difference of the expanſions of the ſteel and one of the braſs bars be called 1 outwards, the quantity of inward motion in the ſame denomination will be 20; conſequently, the ſame heat which elongates the ſteel bar, and carries the balls from the centre of motion, will, at the ſame time, by the exceſs of expanſibility of the braſs bars, bring the ſame balls inwards towards the ſame centre, and the two contrary actions may be adjuſted, by moving the loads up or down their proper ſtems, till theſe oppoſite effects exactly balance one another; for as thoſe diſtances that have been denominated the ſhort ends of the levers are variable in length, or very nearly ſo, varying the longer ends only, *viz.* the diſtances of the balls from the yielding points of the ſprings, conſidered as centres of motion, will alter the ratios, which may be done in the requiſite proportion, till the compenſation is found in the tentative adjuſtments to be perfect. When once the exact compenſation is effected, it is obvious, that the law by which it is preſerved is uniform and conſtant, as that according to which the grid-iron pendulum is conſtructed, which experience has proved to be permanently uſeful in practice. When the balance has its momentum properly adjuſted for rate, with a given maintaining power, eſcapement, and balance-ſpring, and when the balance is put into an exact ſtate of equilibrium, the ſtems being at all times either exactly parallel to the verge, or, if inclined a little by the extremes of temperature, alike inclined, it is ſelf-evident, that, under theſe reſtrictions, the adjuſtment of the loads up or down for temperature will not deſtroy the adjuſtments of rate, and of equilibrium for the poſitions, previouſly made, provided the two loads be of equal weight, and placed in ſimilar poſitions on their reſpective ſtems; and even if one happen to be left a little higher on the ſtem than the other, no ſenſible bad effect will be produced thereby, which circumſtance is one of the greateſt recommendations of the preſent balance. The effects produced by variations of temperature, are ſaid to be produced not by jerks, but regularly, notwithſtanding the united ſtructure of the parts is ſufficiently firm; and, laſtly, the conſtruction is ſo ſimple, that a common workman may ſucceed in making and putting together the conſtituent parts of this balance without difficulty.

Compenſation on the Balance and alſo at the Spring.

Double Compenſation by Berthoud.—F. Berthoud having experienced much inconvenience, and loſt much time in making the adjuſtments of his balances for rate, temperature, and poſition, at length determined to avail himſelf of the curb, as a ſupplemental aid, in addition to the compenſation carried by the balance itſelf; the union of the two modes of effecting the due compenſation, is repreſented in *fig.* 5 of *Plate* XXX. of *Horology*, in ſuch a way that all the acting parts may be ſeen and underſtood: A is the balance-rim of braſs, and bears four croſſes, beſides two projecting bars, B, B; theſe bars carry each a compound or compenſation bar, C, of the uſual conſtruction, the free ends of which are perforated and attached to the ſcrews or loads of temperature, D and D, or, more properly ſpeaking, to the ſliding ſockets on which thoſe loads ſcrew in and out, in making the adjuſtment; E and E are the ſcrews or loads of adjuſtment for mean time: FF is the cock, and G a ſmall cock, bearing a jewel mounted on it, to take the pivot of the balance. The action of the compenſation bars, C and C, needs no explanation, after what we have ſaid about the effect of ſuch pieces borne by other balances: I, is the compenſation bar of the curb for the ſpiral ſpring, ſhewn in the figure, and acts on the bent ſteel bar, K, which holds the curbing pins, and which has its centre of motion under the cock, at a ſhort diſtance from the balance-verge; the quantity of action of I on K is regulated by the holding piece, *a*, ſliding in a dove-tailed groove, between the parallel bars, *b* and *b*, ſcrewed to the piece N, which piece, N, is moveable round a pin under it, near the part, *a*, in ſuch a way as to admit of a little circular motion, together with the compound bar, I, to regulate for mean time without altering the length of I; and a ſlow motion may be given to the piece, N, by the graduated piece, M, which is moveable on the pivots of its arbor, in the plate and ſmall cock, L, while the tooth, or rounded part, lies in a concave part at the end of N, and impels it almoſt imperceptibly as the end, M, moves; the graduations of the piece, M, are ſeen through a hole made in the interior caſe of the watch; and the adjuſtment for rate may be made there without trouble, and without deranging the previous adjuſtments of the balance itſelf; but then, if there is an iſochronal point in the acting length of the ſpiral ſpring, the adjuſtment made by means of the curb will derange its iſochroniſm, which will become ſenſible as the arc of vibration varies in uſe; otherwiſe the adjuſtment for temperature might be completed by varying the length of the compound-bar, I, after this adjuſtment has been nearly effected on the balance itſelf, and after the balance has been brought into a ſtate of equilibrium for the poſitions; but whether the effect produced by the joint agency of two cauſes, will be uniform in all degrees of temperature, has not been ſaid by the author.

Compenſation for the Spring's want of Iſochroniſm.

That property of a balance's regulating ſpring which makes the balance perform all its vibrations, long, ſhort, and intermediate, preciſely in the ſame time, is called its *iſochronal* or *iſochronous* property, from the two Greek words ισος, *equal*, and χρονος, *time*: it has been aſſerted that there is a certain proportion between the length and thickneſs, or between the length and the breadth and thickneſs taken conjointly, which only aſcertains the iſochronal point in any uniform ſpring, of whatever ſhape; this doctrine has been maintained by Dr. Hooke and Peter le Roy ſeparately, and has been ſubſcribed to by Arnold the ſenior, Berthoud, and others, though Pennington of Camberwell ſays there are different points in the ſame ſpring equally iſochronal; now allowing that there is only one point in the length of every ſpring that determines its iſochroniſm, and that conſequently all other lengths of the uniform ſpring regulate the balance uniformly, only while the arcs of vibration remain unchanged, to determine the iſochronal effective length of ſuch ſpring would be to render all compenſations, for want of iſochroniſm, unneceſſary; and this point may in moſt ſprings be aſcertained by repeated trials with long and ſhort arcs ſucceſſively, and by marking down the reſpective reſults; for it is found from experiments, that if ſhortening the regulating ſpring makes the long arcs of vibration to be performed in leſs time than the ſhort ones, and *vice verſâ*, the ſpring under trial is capable of having its total length reduced gradually till the iſochronal length is determined, but, generally ſpeaking, not otherwiſe. Another method of managing the ſpring, which may be ſaid to be effecting a ſpecies of compenſation for want of iſochroniſm, in the total length of an uniform ſpring, is tapering it from the outer to the inner end, till, with a given length, the long and ſhort arcs are performed in equal times; this method was ſtrongly recommended by Cumming in his Eſſay towards the improvement of watch-work, and after him, Earnſhaw has laid much ſtreſs on this particular, ſo much indeed, that he conſiders his ſkill in the adjuſtment of the iſochroniſm, by a tapering ſpring, as conſtituting one of his chief claims to public encouragement; nay, he profeſſes to manage the buſineſs ſo nicely, that he can make ſuch a ſlight deviation from perfect iſochroniſm as will compenſate the *laſſitude* alſo, in the intenſity of his ſprings in uſe!

The firſt notice that we have of a regular compenſation, for want of perfect iſochroniſm in a regulating ſpring, is Harriſon's, when he propoſed to introduce the cycloid-pin which we have already confeſſed we do not underſtand, from the want of ſhading in the drawing of it, as attached to his compenſation curb, in the publication by the Board of Longitude; we may, however, ſtate, that Harriſon, not knowing, probably, that there is naturally an iſochronal length in moſt uniform ſprings, concluded, that the long arcs are naturally performed in leſs time than the ſhort ones, reaſoning from the circumſtance of one of his pieces having been obſerved to go faſter in a horizontal poſition, than in a vertical one, though the arc of vibration was ſhorter in the latter than in the former poſition; he therefore applied his cycloid-pin, as Mudge did after him, as may be ſeen in the drawing of his eſcapement, in ſuch a way that the ſhort vibrations were accelerated by its puſh more than the long ones, that were not ſo long acted on by auxiliary means; but the fact is, the uſe of ſuch a contrivance would neceſſarily have an effect juſt oppoſite to the intended one, if the balance-ſpring happened to be pinned to the ſtud at the contrary ſide of the iſochronal point; that is, if the long vibrations were ſlower than the ſhort ones, the cycloidal contrivance would make the difference ſtill more ſenſible.

Berthoud's Compenſation for want of Iſochroniſm.

Berthoud has given an ingenious method of compenſating the want of iſochroniſm in a balance-ſpring in his "Supplement au Traité des Horloges Marines," which contrivance he calls an *iſochronal compenſator.* (Compenſateur Iſochrone.) The contrivance is repreſented in *fig.* 6. of *Plate* XXX, where A repreſents the balance with three radii; B an eccentric collet of poliſhed ſteel, placed on the balance-verge, and preſſing againſt the large roller C, which is carried by and pivoted into a ſmall frame at the end of the ſlender ſpring D, attached to the cock, E, on the plate of the watch frame, whenever the long vibrations are found by trial to be performed in a longer time than the ſhort ones, the poſition of B and C are reſpectively as in the drawing, at the time when the balance-ſpring is quieſcent; for then the preſſure of the eccentric piece, B, againſt the roller urged by the ſpring, is greater in the ſmaller arcs than in the long ones; but when the long arcs are performed in the leaſt time, the poſition of B muſt be at *b*, and then C will be found by the force of its ſpring at *c*, where it is evident, that the preſſure will be leſs in the ſhort arcs than in the long ones comparatively; and the quantity of eccentricity of B muſt depend on the greateſt difference of the two extreme vibrations. The principal reaſon why Berthoud adopted this iſochronal compenſator in five clocks, and in his portable watch for the longitude, was, that whenever the cock was diſmounted the iſochroniſm of his ſpring, however well adjuſted, was generally found to be deranged when re-mounted. The eccentric collet was of courſe capable of being put to any given eccentricity as well as into any given poſition for accelerating long or ſhort arcs at pleaſure. The Engliſh watch-makers have not, that we know of, ever uſed this contrivance, but depend on their own patience and ſkill, in aſcertaining the beſt length and moſt deſirable ſhape of their regulating ſprings for effecting their own purpoſe.

Mr. W. Hardy's Compenſation for want of Iſochroniſm.

Mr. W. Hardy publiſhed a ſhort account of a new method of making the balance of a chronometer perform its long and ſhort vibration, in the ſame time, in Mr. Nicholſon's Journal for September, of the year 1806. (Supplement of vol. xiv. 8vo. Series) which account, we propoſe, to copy with ſome ſlight verbal deviations, that are more adapted to our figures, as drawn in perſpective. The ſpring *a b*, *fig.* 8 of *Plate* XXX, is ſcrewed to the inferior ſide of the cock A, *fig.* 7. and lies over the upper part of the regulating-ſpring, proceeding in a right line to the axis of the balance B, and having a bend to clear the verge, from which it paſſes on to the end of the ſpring which it holds. This ſtraight ſpring is made of ſuch a ſmall ſtrength, that it comes into action before the regulating ſpring. The other piece *c*, *fig.* 8, is attached to the cock, in a line with the ſlender one, but on the oppoſite face of the cock; the part of the piece, *c*, which is bent down, is divided into a fork and admits the part, *b*, of the ſlender ſpring, to paſs and play between its prongs; at each ſide of the prongs is a lateral ſcrew, preſenting its point to the ſpring, in ſuch a way, that the play between the prongs, or rather between the points of the two equidiſtant ſcrews, may be limited according to circumſtances, provided they are not farther aſunder than the quantity of the eſcapement angle. The other end of the cylindrical regulating ſpring, as uſual, is attached to a piece of metal carried by the verge of the balance. The effect produced by the compenſating ſpring, *a b*, is thus; when the balance is firſt moved from its place of reſt, the ſlender ſpring, *a b*, moves firſt, till it meets with the point of one of the two ſcrews of the fork, then the cylindrical-ſpring begins to be acted on, as in the chronometers in general; this motion of the ſtud, at the end of the ſlender ſpring, retards the motion of the balance, which begins to be accelerated only, when the ſtud is at reſt; conſequently the contrivance before us ſuppoſes that the ſhort arcs are in general performed in leſs time than the long ones; and require on that account, to be checked in their velocity at ſtarting; and the quantity of play in the fork limits the quantum of retardation; but as we have ſeen the long arcs may be, and often are, performed in leſs time than the ſhort ones, with ſprings not adjuſted for iſochroniſm; we conceive, therefore, that, like Harriſon's cycloid pin, which owed its origin to a contrary ſuppoſition, the application of the invention we are deſcribing may happen to be productive of an effect, juſt oppoſite to that which it is meant to produce; for it can be uſed as a compenſation for want of iſochroniſm, only in the particular caſe, when the ſhort arcs of vibration are performed in leſs time than the long ones, which we have ſeen is juſt the oppoſite application of that adopted by Harriſon, and founded, as we have ſaid, on an oppoſite ſuppoſition; whereas the fact is, that ſometimes one of the two contrivances may prove to be neceſſary, and ſometimes the other, with a limited length of ſpring, accordingly as the long, or the ſhort arcs of vibration, may turn out on trial to be performed in the leſs time; and the trial neceſſary for aſcertaining, whether the ſpring is too long or too ſhort, will afford the means of aſcertaining very nearly, if not quite, the exact iſochronal length, ſuch as ſhall require no compenſation at all; to attain which object, though with ſome additional trouble, we are diſpoſed to think the preferable practice.

COMPENSATION-*Pendulum*, is a ſuperior kind of pendulum in which the natural effects of two actions are ſo oppoſed to each other, as to counteract or compenſate each other's influence on the motion of the going pendulum. We have already deſcribed the grid-iron pendulum invented by J. Harriſon, and alſo, Troughton's new arrangement of the metallic bars, under our article CLOCK, to which we muſt here refer; and for the other various conſtructions of a compenſation-pendulum the reader is deſired to conſult the word PENDULUM, where he will find the ſubject treated at conſiderable length.

COMPERTORIUM, in the *Civil Law*, denotes a judicial inqueſt made by delegates, or commiſſioners, to find out, and relate the truth of a cauſe.

COMPETENCE, or COMPETENCY, in *Law*, the authority, or right of a judge, for taking cognizance of any matter. See JURISDICTION.

COMPETENCE *Militaire*, Fr. military juriſdiction. In France, the officer of the troops took cognizance of and poſſeſſed the right of directing the proceſs or proceedings in regard to every thing that concerned military affairs and offences, thoſe excepted, that were puniſhable by the provoſt marſhal, and to judge of all crimes and offences committed by an officer againſt an officer, or by a ſoldier againſt a ſoldier, provided a civil individual had no concern or intereſt in it. And if the civil judges were obliged to cauſe military perſons to be arreſted, the commandants could demand them, and in caſe of refuſal complain to the ſovereign through the miniſter.

COMPETENT *Witneſſes*. See WITNESS.

COMPETENTES, in *Church Hiſtory*, an appellation given to the catechumens, when being ſufficiently inſtructed in the Chriſtian religion they required baptiſm.

COMPEYRE, in *Geography*, a town of France, in the department of Aveyron, and diſtrict of Milhaud; one league N. of Milhaud.

COMPHEDA, a town of Arabia Felix on the Red Sea, S.E. of Mecca, garriſoned by the Turks.

COMPIANO, a town of Italy, in the duchy of Parma; 12 miles from Pontremoli.

COMPIATA, *Ital.* COMPLICS, *Fr.* The laſt prayer or hymn ſung in full chorus, at the end of the ſervice of the Romiſh church.

COMPIEGNE (in Latin, *Compendium*,) a handſome town of France, the chief place of a diſtrict in the department of Oiſe, ſituated on that river at the diſtance of two kiliometres from the confluence of the Oiſe with the Aiſne and 76 kiliometres from Paris. N. lat. 49° 25′. E. long. 3° 12′. A very extenſive foreſt ſtretches from this town to the department of the North and that of the Lys. Before the revolution of 1789 the kings of France reſided occaſionally at the palace of Compiegne to take the diverſion of hunting. This palace was built by Charles the Bald, repaired by ſeveral of his ſucceſſors, and reconſtructed on a grand ſcale in 1755 by Louis XV. There is alſo a beautiful bridge over the Oiſe which formerly was adorned with the arms of France elegantly carved in ſtone by Couſtou: but this fine monument was mutilated in 1793 by a revolutionary ſtone-cutter, who put a cap in its place. Compiegne has a ſub-prefect, two courts of juſtice, and 6359 inhabitants. The diſtrict contains a population of 88,048 individuals, diſtributed in 165 communes. Its principal trade is in wood, corn, and wool. Its wine is much eſteemed. There are but a few manufactures of worſted caps and ſtockings.

COMPITALIA, or COMPITALITIA, feaſts held among the ancients in honour of the *lares*.

The word comes from *compitum*, a *croſs-way*; becauſe the feaſt was held in the meeting of ſeveral roads.

The compitalia are more ancient than the building of Rome. Dionyſius Halicarnaſſus, and Pliny, indeed, ſay that they were inſtituted by Servius Tullius; but this only ſignifies, that they were then introduced into Rome.

Notwithſtanding what Dion relates, that the compitalia were celebrated a little after the Saturnalia, and that the Roman calendar fixes them on the twelfth of January, it appears that they had not fixed any day, at leaſt not till the time of Varro, as is obſerved by Caſaubon.

The feaſt being then moveable, the day whereon it was to be obſerved, was proclaimed every year. It was ordinarily held on the fourth of the nones of February, *i. e.* on the ſecond of that month. Macrobius obſerves that they were held not only in honour of the *lares*, but alſo of *mania*, madneſs. The prieſts who officiated at them were ſlaves and liberti; and the ſacrifice was a ſow. They were re-eſtabliſhed, after a long neglect, by Tarquin the Proud, on occaſion of an anſwer of the oracle, "That they ſhould ſacrifice heads for heads," *i. e.* that for the health and proſperity of each family, children were to be ſacrificed: but, Brutus, after expelling the kings, in lieu of thoſe barbarous victims, ſubſtituted the heads of garlick and poppy; thus ſatisfying the oracle, which had enjoined *capita*, *heads*, at an eaſier rate.

During the celebration of this feaſt, each family placed at the door of their houſe, the ſtatue of the goddeſs *Mania*: they alſo hung up at their doors figures of wool, repreſenting men and women; accompanying them with ſupplications that the *Lares* and *Mania* would be contented with thoſe figures, and ſpare the people of the houſe.

As for ſlaves, in lieu of the figures of men, they offered balls or fleeces of wool. Servius Tullus ordered, that the ſlaves who aſſiſted at the compitalia, ſhould be free during the whole time of the feaſt. Auguſtus ordered the ſtatues of the *Lares*, placed in the croſs ways, to be adorned with flowers twice a year.

COMPLACENCY, in *Pathology* and *Ethics*, denotes full and continued ſatisfaction, connected with a conſiderable degree of approbation. It has intrinſic value, or ſome ſpecies of worth for its object. Some mental excellencies, or advantages accruing from them; ſome ſentiment, diſpoſition, acquirement, conduct, performance, either of ourſelves or of others with whom we are immediately connected, which, upon cloſe examination, we deem deſerving of eſteem or applauſe. Complacency may be enjoyed as the reward of our own conduct, or of the purity and benevolence of our motives; and it may alſo relate to the approved conduct, ſentiments, attainments, and diſpoſitions of others, for whom we are deeply concerned. The ſatisfaction produced by complacency indicates, that we have, in ſome reſpect or other, a perſonal intereſt in the object of it; and the approbation implied in it conveys the idea of ſome kind of excellency. In ſtrict propriety of language, complacency is alone applicable to that ſpecies of good which originates from ſome mental or moral excellence; where there is an indication of propriety, ingenuity, wiſdom, addreſs, or dignity, in ſentiment, deſign, execution, or of rectitude and benevolence in the motive, this affection will poſſeſs different degrees of ſtrength, according to the various kinds and degrees of excellence diſcernible in the exiſting cauſe; and high complacency is the moſt grateful of all the affections. It poſſeſſes an elevation and a ſuavity peculiar to itſelf. It is permanent ſatisfaction, enjoying the full approbation of reaſon; and conſequently it ſuffers no allay from the ſtruggle of contending paſſions, or oppoſite deſires. When it is inſpired by our own conduct, it is accompanied by ſelf-approbation, or the teſtimony of an applauding conſcience, enlivened perhaps by the voice of gratitude, and enriched by the eſteem of the worthy. If it proceed from the conduct of others, it augments the pleaſures of affection, friendſhip, and gratitude. This affection, however, has its counterfeit; and an erroneous opinion of ourſelves may change the nature of this ſublime affection, and render it the parent of vice and folly. Thus falſe conceptions of our own talents, acquirements, and conduct, may inſpire pride, vanity, haughtineſs, and arrogance. Cogan on the Paſſions, p. 71.

COMPLAINANT, in *Law*, a plaintiff, or one who prefers a complaint againſt another, to be relieved by juſtice or equity.

COMPLEMENT, in a general ſenſe, denotes what is wanting, or neceſſary to complete ſome certain quantity or thing.

COMPLEMENT, *Arithmetical*. See ARITHMETICAL.

COMPLEMENT, in *Aſtronomy*, is uſed for the diſtance of a ſtar from the zenith; or the arch comprehended between the place of a ſtar above the horizon, and the zenith. It is the ſame as the complement of the altitude, or co-altitude; or zenith diſtance.

COMPLEMENT *of the courſe*, in *Navigation*, is the number of points the courſe wants of 90 degrees, or eight points; *viz.* of a quarter of the compaſs.

COMPLEMENTS *of the curtain*, in *Fortification*, are thoſe parts of the ſide of the interior polygon, which form the demi-gorges of the two baſtions adjoining the curtain.

COMPLEMENT *of the line of defence*. See LINE *of defence*.

COMPLEMENT, in *Geometry*, is what remains of a quadrant of a circle, or of ninety degrees, after any certain arch has been retrenched from it. Thus, if an arch or angle be 30 degrees, we ſay its complement is 60 degrees, ſince $60 + 30 = 90$.

The ſine of the complement of an arch is called the *coſine*; of a tangent, the *co-tangent*; &c.

We ſometimes alſo ſay the *complement of an angle*; meaning ſo much as it wants of a right angle, or of 90 degrees.

COMPLEMENT, in *Heraldry*, a term uſed to ſignify the full moon, for example, azure, the moon in her *complement*, argent.

COMPLEMENTS *of a parallelogram*, are the two leſſer parallelograms, made by drawing two right lines parallel to each ſide of a parallelogram, through a given point in the diagonal.

Such are the parallelograms C and M (*Plate* III. *Geometry*, *fig.* 50.) It is demonſtrated, that in every parallelogram, the complements C and M are equal: for $Z + C + o = R + M + x$; as making up on each ſide the great triangles, made equal by the diagonal; of which, $Z = R$, and $o = x$ (becauſe the diagonal makes them ſo); wherefore the remaining parallelogram $C = M$.

COMPLEMENT *of life*, in the *Doctrine of Life annuities*, denotes the difference, according to M. De Moivre's hypotheſis, between the age of any given life, and 86 years; thus, at the age of 30 the complement is 56—at the age of 37 it is 49—at the age of 50 it is 36, and ſo on. In this hypotheſis the probabilities of life through every period of exiſtence, are ſuppoſed to decreaſe in an arithmetical progreſſion, ſo that out of 86 perſons juſt born, one is ſuppoſed to die every year, till at the end of 86 years, which is conſidered as the utmoſt limit of human life, the laſt ſurvivor becomes extinct. M. De Moivre, who formed this hypotheſis with the view of facilitating the computations of life-annuities, derived it from Dr. Halley's "Table of Obſervations," at Breſlaw, which, being the only table of the kind at that time, and making the decrements in the middle ſtages of life nearly equal, ſo far ſupported the truth of the hypotheſis, and juſtified M. De Moivre in adopting it. But in the earlier and later periods of life the decrements are ſo irregular as by no means to accord with this hypotheſis; and ſince ſubſequent tables, more accurately formed, and deduced from more extenſive obſervations, have been publiſhed by Dr. Price, Meſſrs. Wargentin, Suſmilch, and other writers on the ſubject; and the values alſo of ſingle and joint lives for all ages have been computed from them; this hypotheſis is rendered unneceſſary, even in caſes where it is moſt correct: in other caſes, which involve two or three lives in the queſtion, eſpecially if thoſe lives be very young or very old, it gives ſolutions ſo inaccurate as to be altogether unfit for uſe.

By ſuppoſing an uniform decrement in the probabilities of life from infancy to extreme old age, the number of years which a perſon has an equal chance of ſurviving is made to be the ſame with the *expectation* which M. De Moivre by his hypotheſis finds to be equal to half the complement of life; ſo that if the age be four, the expectation will be $\frac{82}{2} = 41$; if the age be 82, the expectation will be $\frac{4}{2} = 2$, while the chance that a child aged 4 ſurvives 41 years is $\frac{41}{82}$, and the chance that a perſon aged 82 ſurvives 2 years is $\frac{2}{4}$. Now ſince each of theſe fractions is $= \frac{1}{2}$, it follows, agreeable to what has been obſerved above, that the one has an equal chance of living 41, and the other of living 2 years, or ſuch a number as ſhall be expreſſed by their reſpective expectations. But by the Breſlaw table the expectations of thoſe lives are ſeverally $40.\frac{2}{3}$ and $3.\frac{1}{2}$ years, while the chance of the younger living $40.\frac{2}{3}$ years is .464, and the chance of the elder living $3.\frac{1}{2}$ years is .53: that is, in the firſt inſtance, the chance is leſs, and in the ſecond greater, than an even one, that the perſon lives ſuch a number of years as ſhall be equal to his expectation. This is true in all other tables deduced from real obſervations, and proves that even in the ſimpleſt caſe the hypotheſis is incorrect.

Mr. Thomas Simpſon, inſtead of ſuppoſing the complement to be the difference between 86 and the age of the given life, aſſumed this complement to be equal to twice the expectation when computed from a table of the real probabilities of life, and by this means leſſened the incorrectneſs of thoſe rules which depended entirely on Mr. De Moivre's hypotheſis. But had this excellent mathematician been poſſeſſed of the preſent tables of obſervation, there is no doubt but that he would have adopted a more genuine method of ſolution. As far as relates to the computation of the probabilities of ſurvivorſhip between any given number of lives, M. De Moivre's hypotheſis in many caſes appears to give approximations which are ſufficiently near the truth; but as the mere determination of ſuch probabilities is of no uſe in computing the values of contingent reverſions, inaſmuch as the diſcount of money muſt be blended in each ſeparate year with the chance of ſurvivorſhip in that year, the inveſtigation of them is a matter of no conſequence, and therefore the hypotheſis of an equal decrement, which often leads to great errors in the doctrine of life annuities, may be wholly laid aſide without injury or inconvenience in any caſe. (See Phil. Tranſactions, vol. 78.)

COMPLEMENT *of a Chord*, in *Muſic*, the note or notes wanting in any chord, to complete its harmony.

COMPLEMENT *of an Interval*, is the minute quantity it wants in particular temperaments.

COMPLEMENT, is the difference or remainder between an octave or eighth, and any given interval, called alſo the inverſion of that interval, (ſee INVERSION); thus, a fifth is the complement or inverſion of a fourth, and a fourth of a fifth; a minor third is the complement or inverſion of a major ſixth, and *vice verſâ*. See THIRD, FOURTH, FIFTH, &c.

COMPLETE, in French *complet*, in *Military Language*, a regiment, troop, or company is ſaid to be complete when it has its full complement of officers, non-commiſſioned officers, and privates, agreeably to the regulations for the time being.

COMPLETUS. *flos*, in *Botany*, a complete flower, furniſhed with both calyx and corolla; *incompletus* being uſed when the latter is deficient, and *nudus* when the former.

COMPLEX, a term ordinarily uſed as ſynonymous with *compound*; though, ſtrictly ſpeaking, there is ſome difference between them.

COMPLEX *object*. See OBJECT.

COMPLEX *oppoſition*. See OPPOSITION.

COMPLEX *term*, or *idea*, is a term or idea compounded of ſeveral ſimple or incomplex ones.

Thus, in the propoſition, *A juſt God cannot leave crimes unpuniſhed*; the ſubject of this propoſition, viz *a juſt God*, is a *complex term*, or ſtands for a *complex idea*, compoſed of two ſimple, or *incomplex* ones, viz. *God* and *Juſt*. Mr. Locke obſerves, that though the mind be perfectly paſſive in the formation of ſimple ideas, yet it exerts ſeveral actions of its own about them, when once formed: and that by this means it is, that they become the materials and foundations out of which all our knowledge is framed.

Theſe acts are chiefly three, *viz.* 1. The combining of ſeveral ſimple ideas into one compound one: and thus it is that all complex ideas are made.

2. The bringing two ideas, whether ſimple or complex, together; ſetting them by each other, and ſo viewing them, without uniting them into one; by which it gets its ideas of relation.

3. The ſeparating ſeveral ideas from all other ideas that accompany them in their real exiſtence: and thus all its general ideas are formed.

As ſimple ideas are obſerved to exiſt in ſeveral combinations united together: ſo the mind may conſider them as united, not only as they are really united in external objects, but as itſelf has joined them: ideas thus made up of ſeveral ſimple ones put together, we call *complex*; as man, beauty, army, gratitude, &c.

Complex ideas, however compounded and decompounded, though their number be infinite, and their variety endleſs, may be all reduced under theſe three heads, viz. *modes*, *ſubſtances*, and *relations*; which ſee under their proper heads, MODE, SUBSTANCE, and RELATION. Complex ideas are often conſidered as ſingle and diſtinct beings, though made up of ſeveral ſimple ideas; as body, ſpirit, &c. See COMPOSITION of *ideas*.

COMPLEX *propoſition*, in *Logic*, is that in which the ſubject, or predicate, or both, are made up of *complex* terms: and if the term added to the ſubject be eſſential or neceſſary to it, then it is called *explicative*; otherwiſe it is *determinative*, the adjoined term limiting the ſubject to a particular part of its extenſion. Some logical writers aſcribe the complexion of a propoſition, in ſome caſes, to the copula, as in modal propoſitions; but this rather pertains to the predicate. See *Compound* and *Modal* PROPOSITION.

COMPLEX *ſyllogiſm*, is that in which the middle term is not connected with the whole ſubject, or the whole predicate in two diſtinct propoſitions, but is intermingled and compared with them by parts: *e. g.* The ſun is a ſenſeleſs being, the Perſians worſhipped the ſun, therefore the Perſians worſhipped a ſenſeleſs being.

COMPLEXI *Pars*, in *Anatomy*, a name given by Riolanus, and others, to a muſcle called by Albinus *Biventer cervicis*, and by ſome the *complexus*.

COMPLEXIO, COMPLEXION, in *Metaphyſics*, the union, or coalition of ſeveral things different from each other; either really, or only in our conception. See COMPLEX.

COMPLEXIO, in *Logic*, is ſometimes applied to the ſecond operation of the mind, *viz.* the judgment; conſidered as it affirms or denies any thing; ſuch affirmation, &c. neceſſarily importing a combination of ſeveral things.

Complexio is ſometimes alſo uſed by logicians in the ſenſe of dilemma.

COMPLEXIO, [illegible] both beginning, and ending, with the ſame word.

Thus Tully: "Quis legem tulit?" Rullus. "Quis majorem partem populi ſuffragiis privavit?" Rullus. "Quis comitiis præfuit?" Rullus.

COMPLEXION, in *Phyſics*, is uſed for the temperature, habitude, or natural diſpoſition of the body.

Some philoſophers diſtinguiſh four general and principal *complexions* in man, *viz.* the *ſanguine complexion*, which, according to them, anſwers to the air; having the qualities thereof, as being hot and moiſt. It takes its name from *ſanguis*; becauſe the blood is there ſuppoſed to be predominant.

The *phlegmatic complexion* takes its name from the pituita, or phlegm, in which it abounds; and correſponds to water; being cold and moiſt.

The *bilious*, or *choleric complexion*, takes its name from the bile, or choler: it is ſuppoſed of the nature of fire, hot and dry.

Laſtly, the *melancholic complexion* partakes of the nature of earth, being cold and dry; but this ſort of reaſoning is now not much regarded.

Under this article we may introduce a ſubject that has occaſioned much diſcuſſion, and conſiderable difference of opinion among phyſiologiſts. It relates to the variety of complexion or of colour that has ſubſiſted amongſt the inhabitants of different nations. Some perſons, diſſatisfied with the ſeveral hypotheſes that have been ſuggeſted for explaining this phenomenon, have been led to conceive that there is a ſpecific difference in the human race, and that the variations of colour are owing to their not having ſprung from one common original. But this hypotheſis contradicts the moſt ancient and authentic hiſtory extant, which repreſents Adam and Eve as the progenitors of all mankind; and it is alſo liable to various other objections which we ſhall take occaſion diſtinctly to ſpecify in the courſe of this work. Dr. Hunter, who has publiſhed a theſis on this ſubject, has inveſtigated it with peculiar attention; and he gives it as his decided opinion, that there is no ſpecific difference among mankind. In order to guard againſt the confuſion which has ariſen from the uſe of the term "ſpecies," he begins with defining it, and he comprehends under the ſame ſpecies all thoſe animals which produce iſſue capable of propagating others reſembling the original ſtock, from which they ſprung. According to this ſenſe of the term, he conſiders the whole human race as belonging to the ſame ſpecies. But, as in the vegetable creation, one ſpecies of plants includes ſeveral varieties depending upon climate, ſoil, culture, and ſimilar circumſtances that are incidental, the caſe is the ſame with reſpect to the human race; the varieties that occur pertain to the ſame ſpecies, and are produced by the operation of natural cauſes. Of the different colours that ſubſiſt among mankind, he enumerates the following, *viz.*

- *Black*, comprehending
  - Africans under the Line.
  - Inhabitants of New Guinea.
  - Inhabitants of New Holland.
- *Swarthy*, including
  - The Moors in the northern parts of Africa.
  - The Hottentots in its ſouthern parts.
- *Copper-coloured*, as the Eaſt Indians.
- *Red-coloured*, as the Americans.
- *Brown-coloured*, to which claſs belong
  - Tartars.
  - Perſians.
  - Arabs.
- *Brown coloured*, comprehending
  - Africans on the coaſt of the Mediterranean.
  - Chineſe.
- *Browniſh*, including
  - The inhabitants of the ſouthern parts of Europe; as,
    - Sicilians,
    - Abyſſinians,
    - Spaniards,
    - Turks, and alſo the Samoiedes and Laplanders.
- *White*, to which belong
  - Moſt of the European nations; as,
    - Swedes, Danes, Engliſh, Germans,
    - Poles, &c. Kabardinſki, Georgians, and.
  - Inhabitants of the iſlands in the Pacific Ocean.

In tracing the cauſes of theſe differences of colour, he ſets out with obſerving that its ſeat is unqueſtionably in the ſkin; that it is confined to the cuticle, conſiſting of the epidermis and reticulum; and that it chiefly occupies the latter of theſe. The cuticle, he obſerves, is much thicker and harder in black than in white people; the reticulum in the latter being a thin mucus, in the former a thick membrane. The ſeat of colour in whites he conceives to be tranſparent, and either totally deprived of veſſels, or furniſhed with a very ſmall number; as the yellow colour appearing in the jaundice vaniſhes when the cauſe of the diſeaſe is removed, which is not the caſe with ſtains in the cuticle from gun-powder, or ſimilar cauſes. He then mentions three cauſes which contribute to deſtroy the pellucidity of the cuticle, to give it a brown colour, and to thicken it; *viz.* acceſs of air, naſtineſs, and the heat of the ſun: the effect of theſe he illuſtrates by examples; but he apprehends the laſt to be the moſt powerful. Admitting ſuch influence of theſe cauſes, he ſuppoſes that it is ſufficient to account for all the diverſities of colour, that are obſervable among mankind. He proceeds to obſerve, that all the inhabitants of the torrid zone incline more or leſs to a black colour; and the difference that is perceivable among them may be owing, not to mere heat, but to the other cauſes alſo; and if we conſider that even in the torrid zone there is a conſiderable difference of temperature, the exiſtence of a white nation in this climate would not deſtroy the argument. He is farther of opinion, that the exiſtence of a brown colour, and of conſiderable varieties from white, in the northern and coldeſt parts of Europe, may be very eaſily explained, by adverting to the manner of life of the inhabitants, who of courſe are either expoſed to the inclemency of the air, or to the conſtant naſtineſs of ſmoky houſes. If, to this reaſoning, it ſhould be objected, that infants are ſubject to theſe differences even when they are born, and previouſly to the influence of the cauſes above-mentioned, Dr. Hunter replies, that many peculiarities acquired by parents are tranſmitted to their poſterity; in proof of which, he refers to hereditary diſeaſes, which will continue to affect families for many generations. Thus, a parent expoſed to cauſes that deſtroy the natural whiteneſs of his complexion, will beget ſwarthy children; and the ſame cauſes continuing to operate upon the ſon, the blackneſs will be increaſed. In this manner, all the different ſhades may have been at firſt induced, and afterwards continued. To this objection, however, it might be anſwered, that the fact is not admiſſible; as it is now generally allowed, that the children of the blackeſt negroes are born white.

Mr. Clarkſon, in a diſſertation introduced in his "Eſſay on the Commerce and Slavery of the Human Species," has conſidered and well illuſtrated the ſubject of complexion. In the inveſtigation of this ſubject, the firſt queſtion that occurs relates to the preciſe ſeat of the colour. As the old anatomiſts commonly divided the ſkin into two parts or laminæ, *viz.* the cuticle and cutis or true ſkin, they muſt have ſuppoſed, that as the latter is the ſame in all the varieties of mankind, however different their external hue, the ſeat of colour muſt have exiſted in the cuticle or upper ſurface. Malpighi, however, diſcovered that the ſkin is divided into three laminæ; *viz.* the cuticle, the true ſkin, and a kind of coagulated ſubſtance ſituated between both, which he denominated the "rete mucoſum." Accordingly, this diſcovery ſerved to aſcertain the point in queſtion; for it afterwards appeared, that the cuticle, ſeparated from the other laminæ, was ſemi-tranſparent; and that the cuticle of the blackeſt negro was of the ſame tranſparency and colour with that of the pureſt white; and as the true ſkins of both were invariably the ſame, the rete mucoſum muſt be the ſeat of colour. That this is the fact has been alſo determined by a variety of anatomical experiments and phyſiological obſervations. The cauſes, therefore, that operate in producing difference of colour, muſt effect it by acting on the rete mucoſum, which, from the numberleſs perforations of the cuticle, is no leſs acceſſible than the cuticle itſelf. Theſe cauſes are probably thoſe various qualities of things, which, combined with the influence of the ſun, contribute to form what is called "climate." Moreover, it is a farther confirmation of this hypotheſis, that the mucous ſubſtance before-mentioned is ſubject to variation, according to the difference of climates from the equator to the poles. Thus, the inhabitants of many kingdoms and iſlands of Aſia are found to have their rete mucoſum black; thoſe of Africa, ſituated near the line, are of the ſame colour; thoſe of the maritime parts of the ſame continent, are of a duſky brown, nearly approaching to it; and the colour becomes lighter or darker, in proportion as the diſtance from the equator is either greater or leſs. The Europeans are the faireſt inhabitants of the world: thoſe ſituated in the moſt ſouthern regions of Europe, have in their rete mucoſum a tinge of the dark hue of their African neighbours. Admitting theſe facts, we are led to conclude, that climate has a very conſiderable influence in occaſioning a difference of colour. It has, however, been objected to this reaſoning, that people of the ſame climate, geographically conſidered, or under the ſame parallels, are not exactly of the ſame colour. But to this objection it has been replied, that climate, phyſically conſidered, depends upon a variety of accidental circumſtances. See Climate. It ſhould alſo be conſidered, that, although the inhabitants of the ſame parallel are not exactly of the ſame hue, yet they differ only by certain ſhades of the ſame colour; and, therefore, if climate has really an influence on the mucous ſubſtance of the body, we muſt expect to find not only a gradation of colour in the inhabitants from the equator to the poles, but alſo different ſhades of the ſame colour in the inhabitants of the ſame parallel. We might alſo add another argument of great weight, *viz.* that when the black inhabitants of Africa are tranſplanted to colder, or the white inhabitants of Europe to hotter climates, their children, born there reſpectively, are of a different colour from themſelves, that is, lighter in the firſt, and darker in the ſecond caſe. To this purpoſe the abbé Raynal obſerves, that the children, which the Africans procreate in America, are not ſo black as their parents were; and that after each generation, the difference becomes more palpable. It is poſſible, he adds, that after a numerous ſucceſſion of generations, the men come from Africa would not be diſtinguiſhed from thoſe of the country into which they have been tranſplanted. If we admit the fact above ſtated, that climate has an influence on the mucous ſubſtance, we may reaſonably imagine that this variation of the colour of children from that of their parents muſt take place; for being born white, and not being ſubject to the influence of cauſes equally powerful in colder climates, with thoſe to which their parents were ſubject in the hotter climates from which they were removed, it muſt follow that the ſame effect cannot poſſibly be produced.

On the other hand, we may here allege an important fact, ſtated by Dr. Mitchell (Phil. Tranſ. N° 476. § 4.). "The Spaniards," he ſays, "who have inhabited America, under the torrid zone for any time, are become as dark-coloured as our native Indians of Virginia, of which I myſelf have been a witneſs; and were they not to intermarry with Europeans, but lead the ſame rude and barbarous lives with the Indians, it is very probable that, in a proceſſion of many generations, they would become as dark in complexion." Another writer, deſcribing the European ſettlements on the African coaſt, obſerves, that "there are ſeveral other ſmall Portugueſe ſettlements, and one of ſome note at Mitomba, a river in Sierra Leone; the people here called "Portugueſe" are principally perſons bred from a mixture of the firſt Portugueſe diſcoverers with the natives, and now become, in their complexion and woolly quality of their hair, perfect negroes, retaining, however, a ſmattering of the Portugueſe language."

Another circumſtance might alſo be mentioned by way of corroborating the argument before us; and this is, that the members of the ſame family, ſeparated from each other, and migrating into different countries, have not only changed their family complexion, but have aſſumed as many different colours as the different regions of the globe in which they have ſettled. The Jews furniſh a remarkable inſtance to this purpoſe. Theſe people, though ſcattered over the face of the earth, preſerve themſelves a diſtinct people, and never intermarry with any out of their own body, ſo as to have any mixture of blood in their veins, by which they ſhould differ from each other; and yet it is an undoubted fact, that the Engliſh Jew is white, the Portugueſe ſwarthy, the Armenian olive, and the Arabian copper-coloured; and there appear to be as many different ſpecies of Jews as countries in which they reſide. It appears further from the teſtimony of the moſt ancient hiſtorians, that the darkeſt black complexion has actually changed in a ſucceſſion of years into the pureſt white. Herodotus informs us, that the Colchi were black and that they had criſped hair. Theſe people were a detachment of the Ethiopian army under Seſoſtris, who followed him in his expedition, and ſettled in that part of the world where Colchis is ſaid to have been ſituated. Their deſcendants probably remained in the ſame country. If this be the caſe, they muſt have totally changed their complexion; or the black inhabitants of Colchis muſt have acquired the hue of the fair Circaſſian. If indeed they migrated in any one direction from Colchis and to any diſtance within 1000 miles of Colchis, ſtill they muſt have changed their colour; for if they had gone in an eaſtern or weſtern direction, their colour muſt have been the ſame as that of the Circaſſians; if to the north, whiter; if to the ſouth, of a copper colour. Within the above aſſigned diſtance of Colchis, there are no black people.

Profeſſor Zimmermann of Brunſwick, in his work entitled "The Geographical Hiſtory of Man, &c," has ſatiſfactorily proved, that the complexion of the human ſpecies uniformly correſponds to the degree of heat or cold to which they are habitually expoſed. In eſtabliſhing this poſition, he diſtinguiſhes between climate, conſidered geographically and phyſically, and thus furniſhes an anſwer to the erroneous reaſoning of Lord Kames on this ſubject. At Senegal, and in places adjacent, the thermometer is often at 112 or 117 degrees in the ſhade; and here we find the inhabitants jet-black with woolly hair. The heat is equally great in Congo and Loango, and theſe countries are inhabited by negroes only; whereas in Morocco to the north of theſe regions, and at the Cape of Good Hope, to the ſouth, the heat is not ſo intenſe, nor are the inhabitants of ſo deep a hue. Lord Kames aſks, why are not the Abyſſinians and the inhabitants of Zaara of as dark a complexion as the Moors on the coaſt of Guinea; Zimmermann replies that theſe countries are much cooler. The deſert is not only further from the equator, but the winds blowing over the Atlas mountains, which, like the Alps, are covered with ſnow, and the weſterly wind coming from the ſea, very much mitigate the heat. Nor is Abyſſinia ſo warm, as either Monomotapa or Guinea. The N. E. winds from the ſide of Perſia and Arabia are cooled by their paſſage over the Red ſea; the northern winds of Egypt loſe much of their heat on the chain of mountains that is extended between the countries; the winds from the ſouth and the weſt are ſea winds. Thus the only quarter from which they can derive exceſſive heat is from the weſt, as the air on this ſide muſt paſs over tracts of heated lands. For a ſimilar reaſon negroes are not found either in Aſia or South America, under the equator. Theſe countries, as M. Zimmermann obſerves, being expoſed, from their ſituation, to ſea-breezes and cooling winds from the continent. He alſo obſerves, in confirmation of this hypotheſis, that the mountaineers in warm climates, as in Barbary and Ceylon, are much fairer than the inhabitants of the vallies; that the Saracens and Moors, who conquered the N.E. part of Africa in 1700, from being brown, are become like the negroes near the equator; that the Portugueſe, who ſettled at Senegal in 1400, became blacks; and it is aſſerted by Tudela the Jew, that his countrymen in Abyſſinia acquired the dark complexion of the conquered nations.

Upon the whole it may be obſerved, that colour is a kind of habit of the body, which is gradually acquired, and after a ſucceſſion of ages, fixed and rendered permanent. Thus, the ſanguine countenance will be perpetual in the higheſt latitudes of the temperate zone, and, as we deſcend to the ſouth, we ſhall find the ſwarthy, the olive, the tawny, and the black. The uniformity of the effect in the ſame climate, and on men in a ſimilar ſtate of ſociety, proves the efficacy and the certainty of the cauſe. As mankind are for ever changing their habitations by conqueſt or commerce, we find that, in all climates, they cannot endure the change, but are ſo aſſimilated by time, that we cannot ſay with certainty, whoſe anceſtor was the native of the clime, and whoſe progenitor was the intruding foreigner. For a further illuſtration and confirmation of the general arguments comprehended in this article, we refer to an "Eſſay on the Cauſes of the Variety of Complexion and Figure in the Human Species" by Dr. Smith, profeſſor of moral philoſophy in the college of New Jerſey. See NEGROE.

COMPLEXUS MUSCULUS, in *Anatomy*, derives its name from the intermixture of tendon with its muſcular fibres, which gives to its ſurface a confuſed appearance. It ariſes from the tranſverſe proceſſes of five, ſix, or ſeven of the upper dorſal vertebræ, by ſo many diſtinct ſlips; from the tranſverſe proceſs of the laſt cervical vertebra; and from the oblique or articulating proceſſes of the ſixth, fifth, and fourth vertebræ of the neck. The faſciculi of fibres from theſe numerous points of origin meet together to form a broad, flat, and ſtrong muſcle, which is implanted into the occipital bone, occupying the hollow in front of the external tranſverſe ridge of the bone. It ſometimes receives a ſmall fleſhy portion from the ſpinous proceſſes of one or two of the upper dorſal vertebræ; and is generally connected in ſome degree with the longiſſimus dorſi ſacrolumbalis and tranſverſalis colli. That portion of the muſcle, which is towards the ſpines of the vertebræ, is divided into two fleſhy portions by an intermediate tendon, and is ſeparate from the reſt at its origin; this is deſcribed by Albinus, Soemmerring, and others, as a diſtinct muſcle, by the name of biventer cervicis: we follow Cowper, Douglas, and Winſlow, in conſidering this as a part of the complexus, ſince it is always connected to the reſt of the muſcle, for two or three inches before its inſertion.

The action of the complexus conſiſts in carrying the head backwards upon the atlas; and in reſtoring it to the erect poſition, when it has been bent forwards. Its longeſt fibres will alſo have the ſame effect on the neck, *viz.* that of ſtraightening and carrying it backwards.

COMPLEXUS, *Minor*, is a name given by Winſlow, to the trachelo-maſtoideus muſcle, which ſee.

COMPLICATION *of diſeaſes*, a mixture, or combination of ſeveral diſeaſes; eſpecially where they have any affinity to one another; as the dropſy, aſthma, and jaundice, happening together.

What much perplexes the phyſicians is, when with a fever there is a complication of ſome other diſorder.

COMPLINE, in *Eccleſiaſtical Antiquity*, denotes that even-ſong, which completed the whole ſervice of the day in religious houſes, and began at nine of the clock at night.

COMPLUTENSIAN BIBLE. See *Greek* BIBLES, and POLYGLOTT. The Complutenſian edition of the Bible, which the reader will find deſcribed and particularly noticed, under the articles to which we have referred, has been highly extolled by Mill and Goeze, and as much depreciated by Wetſtein and Semler. Michaelis, in the ſecond edition of his "Introduction," &c. endeavoured to ſteer a middle courſe between the oppoſite opinions of Mill and Wetſtein; though he believed, on the authority of the latter, that the editors, actuated by religious zeal, had materially altered the Greek text from the Vulgate. But Goeze, he ſays, in his "Defence of the Complutenſian Bible," printed at Hamburgh, in 1765, has enabled him to form a proper judgment of that work; and he acknowledges, that he had too cloſely adhered to the opinion of Wetſtein, after the peruſal of the following publications by the ſame author, *viz.* "Complete Defence of the Complutenſian Greek Teſtament, with a Collection of the principal Differences between the Greek Text, and the Latin Text of that Edition," printed in 1766, and the "Continuation of the Defence of the Complutenſian Greek Teſtament, &c." publiſhed in 1769. Michaelis, having ſince had acceſs to the Complutenſian bible in the univerſity library of Gottingen, has been enabled to ſpeak of it with greater certainty. He has particularly uſed it in the Greek verſion of Geneſis, the Proverbs of Solomon, and the firſt book of the Maccabees; and in theſe books he has found its reading as pure, and as little altered from the Latin, as Goeze had deſcribed them. It has been queſtioned what were the MSS. from which this edition was prepared, and whether the editors had any beſides thoſe which were ſent to them from Rome; the ſilence of the editors is no proof of the contrary, for they make no mention of the Codex Rhodienſis, which had been preſented to Cardinal Ximenes, though Stunica, in his controverſy with Eraſmus, frequently applies to it, as a MS. uſed in the Complutenſian edition; and the Codex Beſſarionis, which was uſed in the Septuagint, had been preſented to him, by the ſenate of Venice. Moreover, as the New Teſtament was begun in 1502, it is wholly incredible that they ſhould have had no other MSS. than thoſe ſent from Rome, becauſe Leo X. who communicated theſe MSS. was not pope before the year 1513, and the ſubſcription at the end of the Revelation bears date January 10, 1514. If, therefore, the MSS. were ſent by Leo X., they muſt have arrived when at leaſt three parts of the Greek Teſtament were already printed, and yet the editors, at leaſt in the preface, mention no other MSS. One mode, ſays Marſh, in his notes on Michaelis's tranſlation, of ſolving this difficulty is, to ſuppoſe that MSS. were ſent from Rome by Julius II. the predeceſſor of Leo X., and that the writer of the preface to the Complutenſian Greek Teſtament, who knew that the latter was at that time pope, but, perhaps, was ignorant how long he had reigned, committed an anachroniſm in aſcribing to Leo X. what had been done by Julius II. Or, perhaps, he knew that they were ſent by Julius II.; but meant to flatter the vanity of the reigning pope, by attributing to him the act of his predeceſſor. Or, Leo X. might, before he was pope, have been inſtrumental in procuring them from the Vatican, and be therefore entitled to the compliment. However this be, it ſeems probable, that the editors, beſides the Codex Rhodienſis, had other MSS. of the Greek Teſtament, which had been procured by the cardinal. But whether they were ancient or modern, of great or little value, it is difficult to determine, as the editors have given no account of them. Wetſtein thinks they were modern, becauſe the readings of the Complutenſian bible have a remarkable agreement with thoſe of the MSS. written in the 14th, 15th, and 16th centuries; and this opinion is confirmed by the ſhape of the types, for they are ſuch as we find in the moſt modern MSS; and it is probable that the editors had their types caſt in imitation of the MSS., which they employed on the occaſion. Michaelis, however, in this account of the types, is not quite accurate; for of all the ſpecimens of Greek hand-writing, which Montfaucon has given in his "Palæographia Græca," from the firſt introduction of the ſmall letters down to the 15th century, none reſemble the types of the Complutenſian edition more than that which is found in MSS. of the 9th century. On the other hand, letters not very unlike the Complutenſian are found in MSS. of the 11th, 12th, and even 13th centuries. Moreover, as no MS. written in ſuch letters, as are uſed for the Complutenſian edition, is without accents, and the editors appeal not to the MSS. which they actually uſed but to the poems of Callimachus, and the Sibylline prophecies, there is reaſon to ſuſpect, that their MSS. had accents, and conſequently were modern. Accents, however, if it be allowed that the Complutenſian edition had them, though it has been generally ſaid (not juſtly) that it is printed without them, afford no proof that a MS. is modern; for they are found in ſeveral very ancient MSS. written even with uncial letters, as the Vaticanus, Claromontanus, &c. &c. and perhaps, ſays Mr. Marſh, there are as many ancient MSS. with uncial letters, which have accents as thoſe which have not.

With regard to the main queſtion, whether the MSS. uſed by the Complutenſian editors were ancient and valuable, Mr. Marſh candidly acknowledges that he is too little acquainted with the Complutenſian bible to be able to form any judgment; and he therefore contents himſelf with obſerving, that Grieſbach accedes to the opinion of Wetſtein and Semler, and ſays, in the preface to the ſecond volume of his Greek Teſtament (p. 16); "Complutenſes non habuerunt codices Græcos, niſi paucos, recentes, exigui fere, ſi ad lectionum bonitatem ſpectes, pretii."

It has been ſuggeſted, that the Complutenſian editors, in conſequence of a too high opinion of the Vulgate, and a miſtaken zeal for the Chriſtian religion, have ſometimes introduced into the Greek text readings of the Vulgate, which they did not find in the Greek MSS.

The Greek text of the diſputed paſſage, 1 John, v. 7., in the Complutenſian edition, ſeems to have been a mere tranſlation of one of the editors; becauſe the paſſage is found in not a ſingle ancient, and in only two modern MSS. the Montfortianus and the Ravianus, the latter of which is only a copy of this edition; and in the former, the text is very different from that in the Complutenſian edition. It cannot, therefore, as in the third edition of Eraſmus, have been taken from this MS.: though, on the other hand, it is not impoſſible that they found it in ſome modern MS., in which the paſſage, as in the codex Montfortianus, had been already tranſlated. The queſtion can never be decided, becauſe the MSS. which they uſed are either deſtroyed, or are at leaſt unknown. For an account of the fate of theſe MSS., ſee the article Alcala. Michaelis candidly explains the conduct of the Complutenſian editors ſo as to remove the charge of diſhoneſty. They might believe, he ſays, that this paſſage was really genuine, and, on account of its ſuppoſed importance, take no notice of its alteration from the Greek MSS.; in the ſame manner as the verſe has been inſerted by later editors in Luther's verſion. Or, they might have made ſome remarks on it, which were afterwards eraſed by the cenſors of this edition; for, contrary to their uſual cuſtom, they have a marginal note on 1 John, v. 7., which is in itſelf unimportant, and almoſt implies that ſomething originally preceded. If they have taken the paſſage from a modern MS., they have only acted like Eraſmus, who has inſerted it on the authority of a very modern MS. which he had never ſeen. In ſhort, many of the beſt editors have been guided in this paſſage by a miſtaken zeal for the Chriſtian religion, and have acted on principles which they have never admitted in other places. It was the principal object of Goeze to ſupport the authenticity of this paſſage, and as it occurs in the Complutenſian bible, he defended the antiquity and value of the Greek MS. from which he ſuppoſed that paſſage had been taken. On the other hand, Semler's object was to ſhew the ſpurioufneſs of this paſſage, and at the ſame time to ſupport the opinion of Wetſtein, that the text of the Complutenſian Greek Teſtament, in general, is of little value. The genuineneſs of this paſſage is now generally exploded by the moſt approved biblical critics.

The Complutenſian edition is extremely ſcarce, becauſe only 600 impreſſions were taken off, and is become too expenſive for a private library. That which is now at Gottingen coſt 480 florins, and the late Münchauſen gave an order to his commiſſioner as far as 900; and the price of it, ſays Michaelis, will ſtill increaſe, in proportion as its great excellence, eſpecially in the Septuagint, ſhall be better known. Mill, Bengelius, and Wetſtein, have collated this edition as a MS. with great diligence; but their extracts are by no means complete. Goeze has alſo given extracts from it, in his "Complete Defence of the Complutenſian edition," (p. 277), which, in the proper ſenſe of the word, may be called critical, and which no future editor of the Greek Teſtament ought to leave unnoticed. Michaelis thinks, that a real ſervice would be rendered to thoſe who are engaged in ſacred criticiſm, if a new edition both of the Greek and Latin Teſtament was publiſhed, that was an exact copy of the Complutenſian. From the Greek text of the Complutenſian edition were printed the following, *viz.* ſeven at Antwerp in 1564, 1573, 1574, 1590, 1591, 1601, 1602; five Geneva editions in 1609, 1619, 1620, 1628, 1632; and, laſtly, that of Mayntz, in 1753. Theſe are all deſcribed in Le Long Bibl. Sacra, ed. Maſch. P. i. p. 191—195. See Polyglott.

COMPLUTICA, in *Ancient Geography*, a town of Spain in the Tarragonenſis, placed by Ptolemy in the country of the Callaici, and thought to be the preſent village of Compludo, in Galicia. It is marked in the chart of M. d'Anville on the right of the Durius, to the ſouth-weſt of Pallantia.

COMPLUTUM, a town of Spain, in the Tarragonenſis, placed by Ptolemy in the country of the Carpetani, and marked in the chart of M. d'Anville in Hiſpania citerior, N.E. of Mantua; now *Alcala de Henares*, which ſee.

COMPOLI, in *Geography*, a town of Italy, in the kingdom of Naples, and province of Lavora; 4 miles E. of Sora.

COMPONE', or *Gobony*, in *Heraldry*, is compoſed of two colours in equal diviſions in a border, or any other ordinary; if it conſiſts of two ranges it is called counter-compony, and if of three, it is then termed chequé, and is generally uſed in a border to denote illegitimacy.

COMPOS *Mentis*. See Non-Compos.

COMPOSED *Baſtion*. See Bastion.

COMPOSER *of Muſic*, a perſon who invents a melody, and cloaths it with harmony, according to the eſtabliſhed rules of the art. Under the word *compoſition* we ſhall detail the qualifications requiſite to ſupport this character. Yet theſe are inſufficient to form a complete compoſer, whoſe productions will be felt and admired whenever they are heard. All the ſcience poſſible, without the inſpirations of genius, is unable to command attention, and intereſt an audience, at all times, and in all places. They are only gifted men that poſſeſs ſuch powers. What is meant here by genius, is not a whimſical and capricious imagination, that quits a flowery road to ramble in thickets, through briars and brambles; that to render harmony piquant, loads it with diſcords; and inſtead of grace and elegance, is labouring to ſurpriſe by extraneous modulation, and to divide the whole ſcale into half notes; true genius is that latent fire which inflames the compoſer, irreſiſtibly forces him to write, and inceſſantly ſupplies him with new melodies, always agreeable, expreſſive, and natural, accompanied by a harmony pure, touching, and majeſtic, which embelliſhes melody, without overpowering it. "This was the guide" ſays the Citizen of Geneva, "that led Corelli, Vinci, Perez, Jomelli,

melli, and Durante, to the ſanctuary of harmony; and Leo, Pergoleſi, Haſſe and Buranello, to that of good taſte." We have to add to theſe, Handel, whoſe ſublime works were never heard by Rouſſeau; the elder Stamitz, Piccini, Sacchini, Cimarosa, and Paeſiello, with Haydn and Mozart, who have gone ſomewhat further in vocal muſic, and many leagues in inſtrumental,.

The knowledge of harmony is doubtleſs the foundation of compoſition. To fill the chords, prepare and reſolve diſcords, find the fundamental baſe, and know all the other little elementary rules, is neceſſary; but with the rules of harmony alone, we are not nearer being compoſers, than being orators by knowing the rules of grammar. Padre Martini ſays, that no one can be a good compoſer without ſinging in good taſte, and playing well upon the organ. His rules are for a real *maeſtro di capella*, an eccleſiaſtical compoſer; but for ſecular muſic he would have ſaid it was neceſſary to ſing and play well on the harpſichord or piano forte. In ſetting words for the ſtage, he ought to know what paſſages are difficult, and what eaſy to execute; what ſtyle ſuits the ſinger, and what the character he has to repreſent; he is to know the compaſs of voices and inſtruments, and their peculiar genius and powers; how to produce effects, and when to apply them; to feel the character of different meaſures; to know all the difficulties and pedantry of the art: imitations, fugues, canons, double counterpoint, and how to write for double, triple, and quadruple choirs. To theſe add the myſterious laws of modulation; and all this is no more than preparatory to compoſition. But he muſt inherently poſſeſs a fund of beautiful melodies, ſublime harmony, and grand deſigns.

Beſides correct harmony, correct expreſſion, in lyric compoſitions, is required. The ſpirit of three ſeveral kinds of compoſition muſt be called up in writing for the church, the ſtage, and the chamber. In the firſt, ſolemnity and harmony muſt be invoked; in the ſecond, a diſtinct ſtyle for each character, ſtrongly marked by the poet; ingenious and ſpirited ſymphonies, picture ſque accompaniments, a judicious mixture of inſtruments, and their peculiar powers, occaſionally called forth; and for the third ſpecies of compoſition, pieces that require but few hands and few voices; free from all tremendous difficulties, in want of no wind inſtruments; and, unleſs catches and glees are in queſtion, no proviſion need be made for more than one or two voices, and a quartet band. *La muſica di camera*, chamber muſic, requires eaſe, grace, and elegance, more than force, energy, and feats of execution.

Among the various ſtyles of compoſition for which an accompliſhed maſter ſhould be prepared, is the military, in which wind-inſtruments and drums are chiefly employed. To know the compaſs, ſcale, genius, and defects, of the trumpet, horn, clarinet, hautbois and baſſoon, both in the orcheſtra and the field, will require ſome ſtudy, counſel and experience.

Rouſſeau ſeems ſometimes to regard muſicians as mere inſtruments, incapable of reflexion; and that it is the buſineſs of philoſophers to think for them; ſo imagine M. Suard, and all ſpeculative muſicians; but in the following advice to a compoſer, Jean Jaques ſeems to require more meditation and reflexion than the dæmon of compoſition, by which a man of genius is poſſeſſed, will allow; who, abſorbed in his own ideas, or impelled by the ideas of others, flies to his pen or his inſtrument, without metaphyſical reaſoning, or analytical inquiry into the foundation of his art. But Rouſſeau ſums up the article *Compoſer (Compoſiteur)*, in his Dictionary, with the following inſtruction. "In compoſing, the author has to conſider the phyſical production of ſound, and that its ſole uſe is to delight the ear; or if he mounts up to imitative muſic, he has to move the paſſions by moral effects. In the firſt inſtance, he has to ſelect the moſt pleaſing ſeries of ſound, and agreeable harmony; but in the ſecond, he ought to conſider muſic with reſpect to its ſimilarity with the inflexions of the human voice in ſpeech, and the poſſible conformity between the harmonical combinations of ſound and imitable objects." This is all very fine and profound: but we apprehend, that the moſt happy effuſions of genius have been generated without ſpeculative aſſiſtance.

For the mechanical rules by which a compoſer is to ſteer, we ſhall refer our readers to the article COUNTERPOINT; where, though its principal rules are diſperſed through the work, we ſhall collect and form them into a ſynopſis, and illuſtrate precepts by examples.

In this muſical grammar, we ſhall perplex the ſtudent with no mathematical calculations, no ratios, harmonics, or ſpeculations on the philoſophy of ſound; but adhere cloſely to practical knowledge of immediate uſe in the firſt ſtages of ſtudy. We ſhall not even attempt to give new melodies, or harmonical combinations; but endeavour to indicate the foundation on which the beſt models of compoſition have hitherto been built. See COUNTERPOINT, CONCORDS, DISCORDS, HARMONY, and MODULATION.

COMPOSITÆ, or COMPOSITI, in *Botany*, the twenty-firſt natural order in the Philoſophia Botanica of Linnæus; and the forty-ninth in the Prælections, publiſhed after his death by Giſeke. The plants with compound flowers are kept diſtinct by moſt authors, with only a little difference as to the proper limits and moſt convenient diviſions of the order. But Linnæus obſerves, that, though it is perfectly natural, its eſſential character is not eaſily determined. A compound flower, from the obvious meaning of the term, implies the union of ſeveral flowers, or florets, as in this caſe they are uſually called, by ſome common band. But this character is not peculiar to the compoſite plants, nor does it extend to all their genera. For cephalanthus, dipſacus, ſcabioſa, &c. have ſeveral florets included in a common calyx, but belong to a different family; and ſeriphium, corymbium, and ſtrumpfia, have only one flower in each calyx, and yet cannot be ſeparated from thoſe which are truly compound. Nor will the united anthers, which Linnæus has taken for the diſtinguiſhing character of his artificial claſs ſyngeneſia, exactly apply to this natural order; jaſione, viola, impatiens, &c. have ſuch anthers, but cannot properly be arranged with the compoſitæ.

In the Philoſophia Botanica the order ſtands thus:

I. *Semifloſculoſi*, prenanthes, lactuca, chondrilla, hieracium, crepis, andryala, hypochæris, picris, hyoſeris, leontodon, ſcorzonera, tragopogon, ſcolymus, ſonchus, lapſana, cichorium, catananche, elephantopus. II. *Capitati*, echinops, ſphæranthus, gundelia, arctium, ſerratula, onopordum, carduus, cynara, carthamus, carlina, cnicus, atractylis, centaurea, corymbium. III. *Corymbiferæ*, ſtoebe, ſantolina, chryſocoma, tanacetum, kleinia, ſtoehelina, xeranthemum, gnaphalium, carpeſium, conyza, tarchonanthus, baccharis, erigeron, tuſſilago, doronicum, ſolidago, ſenecio, inula, aſter, gerbera, othonna, chryſanthemum, matricaria, buphthalmum, anacyclus, cotula, anthemis, achillea, eriocephalus, helenium, arctotis, bellis, tagetes. IV. Helianthus, rudbeckia, coreopſis, bidens, verbeſina, ſigeſbeckia, milleria, ſilphium, eupatorium, ageratum, oſteoſpermum, calendula? chryſogonum? melampodium? tridax? tetragonotheca?

All theſe are retained in the Prælections, except gerbera, which has been aboliſhed, and its ſpecies referred to arnica. Several of them are alſo placed in different diviſions.

The following is the arrangement in the ſynoptic table annexed to the Prælections. Thoſe printed in Italics were added by Linnæus himſelf; and thoſe marked with aſteriſks are additions by Giſeke.

I. *Capitatæ*, gundelia, echinops, ſphæranthus, arctium, ſerratula, carduus, cnicus, onopordum, cynara, carlina, *gorteria*, atractylis, carthamus, centaurea, *zoegea*, elephantopus, removed from ſemifloſculi, *barnadeſia*, *vernonia, *Schreb.* *liatris, *Gært.* II. *Semifloſculoſæ*, ſcolymus, cichorium, catananche, lapſana, hypochæris, *ſeriola*, *krigia, *Schreb.*, hyoſeris, *rothia, *Schreb.*, andryala, crepis, hieracium, leontodon, prenanthes, chondrilla, lactuca, ſonchus, *apargia, *Scop.*, picris, ſcorzonera, tragopogon, *geropogon*. III. *Diſcoideæ*, gnaphalium, xeranthemum, ſtœhelina, tanacetum, matricaria, carpeſium, chryſanthemum, *pteronia*, baccharis, *oſmites*, conyza, inula, erigeron, *cineraria*, tuſſilago, doronicum, *arnica*, ſenecio, ſolidago, chryſocoma, aſter, *leyſera*, ſantolina, anthemis, anacyclus, cotula, *athanaſia*, achillea, *cacalia*, *perdicium*, bellis, ageratum, removed from oppoſitifolii, eupatorium, removed from oppoſitifolii, *ethulia*, *kuhnia*, *bellium*, *unxia*, *mutiſia*, *lavenia, *Soland. Sw.* *kleinia *Jacq.* Giſeke obſerves, that it is not eaſy to determine why Linnæus has given the name of diſcoideæ to this order, which nearly correſponds with his former corymbiferi; ſince the greater part of them are not diſcoid, in the uſual ſenſe of the word, but furniſhed with a ray. IV. *Not named by Linnæus.* Corymbium, removed from ſemifloſculi, helenium, othonna, and arctotis, removed from corymbiferæ, calendula, and oſteoſpermum, removed from oppoſitifolii, *ſclerocarpus, *Jacq.* V. *Oppoſitifoliæ*, *ſpilanthus*, bidens, verbeſina, ſigeſbeckia, coreopſis, ſilphium, tetragonotheca, *polymnia*, *trixis, *Swartz.*, helianthus, rudbeckia, milleria, buphthalmum, removed from corymbiferi, chryſogonum, melampodium, tridax, *pectis*, tagetes, removed from corymbiferi, *zinnia*, *calea*, *amellus*, *eclipta*, *baltimora*, hippia, *oedera*, *clibadium*, *jungia*, *relhania, *L'Herit.*, *boltonia, *L'Herit.*, *meyera, *Schreb.*, *phactuſa, *Gært.*, *galardia, *Lam.*, *berckheya, *Ehrh.*, *craſpedia, *Forſt.*, *didelta, *L'Herit.*, *tetranthus, *Swartz.*, *rolanda, *Rottb.*, *ſhawia, *Forſt.* VI. *Nucumentaceæ*, ſtoebe, and tarchonanthus, removed from corymbiferæ, *artemiſia*, *ſeriphium*, eriocephalus, removed from corymbiferæ, *filago*, *micropus*, *iva*, *parthenium*, *ambroſia*, *xanthium*, *ſtrumpſia*.

None of the plants of this order are poiſonous, except tagetes, doronicum, and arnica. Moſt of them are bitter and unpleaſant to the taſte, but poſſeſſed of ſtrengthening qualities as a medicine. Some, however, are leſs bitter and eſculent; and ſeveral others are rendered ſo by cultivation and blanching.

Vaillant, Juſſieu, and Ventenat have divided this order into three: *chicoraceæ*, *cinarocephalæ*, and *corymbiferæ*.

COMPOSITE NUMBERS, in *Arithmetic*, are ſuch as can be exactly divided by ſome ſmaller number or numbers, without leaving any remainder; ſuch as do not admit of this even diviſion, are called PRIME *numbers*, which ſee. The following table of compoſite and prime numbers under 100, ſhewing all their prime diviſors, will be found uſeful in a great variety of calculations.

	Units	1	2	3	4	5	6	7	8	9
Tens	0	1	2	3	2^2	5	2.3	7	2^3	3^2
1	2.5	11	$2^2.3$	13	2.7	3.5	2^4	17	2.3^2	19
2	$2^2.5$	3.7	2.11	23	$2^3.3$	5^2	2.13	3^3	$2^2.7$	29
3	2.3.5	31	2^5	3.11	2.17	5.7	$2^2.3^2$	37	2.19	3.13
4	$2^3.5$	41	2.3.7	43	$2^2.11$	$3^2.5$	2.23	47	$2^4.3$	7^2
5	2.5^2	3.17	$2^2.13$	53	2.3^3	5.11	$2^3.7$	3.19	2.29	59
6	$2^2.3.5$	61	2.31	$3^2.7$	2^6	5.13	2.3.11	67	$2^2.17$	3.23
7	2.5.7	71	$2^3 3^2$	73	2.37	3.5^2	$2^2.19$	7.11	2.3.13	79
8	$2^4.5$	3^4	2.41	83	$2^2.3.7$	5.17	2.43	3.29	$2^3.11$	89
9	$2.3^2.5$	7.13	$2^2.23$	3.31	2.47	5.19	$2^5.3$	97	2.7^2	$3^2.11$

In the above table, any number is to be ſought for in the angle of meeting of its *tens*, in the front column, and its *units* in the top line; thus, 23 will be found in the line with 2 at its beginning, and under three at the top. The prime numbers are diſtinguiſhed by larger figures, and the compoſite numbers have their component primes ſhewn, ſeparated by dots to expreſs, in this caſe, the ſign of multiplication, as is frequently done by the writers on ſeries; thus 84 is compoſed of the ſquare of 2 or 2^2, multiplied by 3 and by 7; 72 is compoſed of the cube of 2 into the ſquare of 3. Matter of curious reflection will be furniſhed by this table to ſuch as ſtudy the properties of numbers, by tracing the parallel lines in which each prime occurs; thus, in one diagonal of the above table, the whole of the multiples of 11 will be found, while 3^2 (or 9) will be found in the compoſition of every number in the other diagonal line; parallel to which, in every alternate line, the other multiples of 3 will be found. The fives and the twos will all be found to occur throughout every vertical column in which they occur at top; and under 0, they both occur in every line. This uſeful and curious table we found in M. Overend's manuſcripts, in the library of the Royal Inſtitution, where the moſt copious tables of compoſite and prime numbers may be ſeen, by thoſe who are curious in theſe matters.

COMPOSITE *Numbers*, in *Muſical Calculations*, are ſuch as are compoſed by the multiplication of the prime integers, 2, 3, and 5; all primes larger than theſe, or compoſite numbers into which ſuch enter, are not muſical numbers, but are irrational or ſurd in a muſical ſenſe. See Musical Numbers.

Composite, or *Roman Order*, in *Architecture*. This name is uſed to denote a kind of column whoſe capital is compounded of the Ionic and Corinthian forms; the vaſe or tambour of the capital being like that of the Corinthian order, and ornamented in the ſame manner, with two tiers of leaves, and with a ſimilar abacus; but to theſe are added Ionic volutes which ſupply the place of the caulicoli and ſeroles, proper to the Corinthian capital. See the plates of capitals. In other reſpects, in the ſhaft baſe and entablature, there is no uniform and aſſignable difference between the Compoſite and Corinthian, and we ſhall, in a ſubſequent portion of this article, examine what claims this compoſite has to be conſidered as a diſtinct order.

The principal remains of antiquity in which the compoſite capital is found, are the following; the arch of Titus, the arch of Septimius Severus, and the arch of the goldſmiths, the building commonly called the Temple of Bacchus, without the gate of Sta. Agneſa at Rome, the baths of Diocletian, the Baptiſterium of Conſtantine, which is ornamented with porphyry columns of the moſt exquiſite workmanſhip, removed from ſome more ancient edifice; the arch at Verona, and the chapel or baſilica at Niſmes.

This capital was therefore very popular among the Roman architects, but it does not by any means appear that they admitted a diſtinct compoſite order. A paſſage of Vitruvius will throw ſome light upon this point; this author, after deſcribing the capitals of the Doric, Ionic, and Corinthian orders, proceeds to obſerve, that "there are alſo other kinds of capitals called by various names, which are diſpoſed on the ſame columns, and which have no proper ſymmetry or relation to any ſeparate order of columns, but they are all derived and transferred from the Corinthian, Pulvinated (Ionic) or Doric orders, from whoſe ſymmetries they only differ in the little novelties of the ſculpture." In fact, the remains of Roman antiquity furniſh a vaſt variety of capitals, many of which are more remarkable and remote from the uſual orders, as well as more beautiful than the compoſite capital, and yet no architect has ever thought of erecting any of theſe into diſtinct orders. The capitals of the Temple of Concord at Rome, a very entire and conſiderable remain, are compoſite, being a melange of the Ionic and Doric; but no one has claimed the honours of an order for this ſtrange production.

The difference between the pretended Compoſite order and the Corinthian, exiſts merely in the capital; for neither in the remains of antiquity, nor in the works of modern artiſts, is there any decided, uniform, and characteriſtic difference in any other particular. But the capital, though an important member, is not of itſelf ſufficient to form an order, otherwiſe we ſhould reckon not five but hundreds; and a compoſition which has no appropriate proportions, no excluſive character, can only be regarded as a variety of that order with which it is perpetually liable to be confounded. The equivocal nature of this production has cauſed great embarraſſment to the ſyſtem-mongers of architecture; for while its later origin would lead them to place it laſt in their ſyſtems, and higheſt in their buildings, its heavineſs of appearance, in compariſon with the Corinthian order, ſeems to indicate a contrary arrangement. It is unneceſſary; for the three Grecian orders ſupply all the expreſſions which architecture is capable of giving with diſtinctneſs. The Doric is ſtrong, the Ionic elegant, and the Corinthian rich; while they admit all the modifications of theſe qualities that can be required; but as to the Compoſite, what is it but an exaggeration of the Corinthian, in which the attempt at ſuperior richneſs has only produced a degree of heavineſs.

It has been before obſerved, that the Romans affected no particular entablature to the compoſite capital. In the temple of Bacchus the cornice is entirely plain, with a ſwelled frieze. The arch of Septimius Severus has a cornice enriched with dentils extremely ſimilar to the Ionic of the temple of Fortuna Virilis, and the theatre of Marcellus; while the cornices of the arch of Titus, and the arch at Verona have both dentils and modillions, and the whole profile of the entablatures is preciſely in the ſtyle of the generality of Corinthian examples. Among the moderns, Palladio has imitated the frontiſpiece of Nero in his cornice and architrave; but he has omitted its beautiful frieze, and ſubſtituted a ſwelled one. Scamozzi's entablature being only one-fifth of the column, and much divided, has rather a trifling appearance, though the details are upon the whole well deſigned. Vignola's compoſite has nothing in it remarkable; the architrave differs but little from that of the frontiſpiece of Nero, and the cornice is nearly the ſame with that of his Ionic order. Serlio's entablature is extravagantly abſurd, being taken from the fourth order of the coliſeum, a compoſition well enough adapted for the termination of that gigantic edifice, but wholly diſproportionate to a ſingle order.

Composite *Stalk*. See Stalk.

COMPOSITIO Mensurarum, the title of an ancient ordinance for meaſures, not printed; it is mentioned in the ſtatute of 23 Hen. VIII. cap. 4.

COMPOSITION, in a general ſenſe, is the uniting or joining of ſeveral different things, ſo as to form one whole, called a *compound*.

The ſchoolmen diſtinguiſh two kinds of compoſition; the one *entitative*, which is between things of the ſame nature, *e. gr.* two or more drops of water: the other *eſſential*, when things of different kinds are joined, and thus conſtitute new things, or eſſences, different from any of the parts: and thus, ſay they, from the matter and the form of wood, ariſes wood; whoſe eſſence is very different from either of thoſe ingredients taken ſeparately.

Composition *of bodies*, in *Chemiſtry*. See Combination and Affinity.

Composition, in *Commerce*, a contract between an inſolvent debtor and his creditors; whereby the latter agree to accept a part of the debt, in compenſation for the whole, and give a general acquittance accordingly.

Composition *for Trees*, in *Gardening*, a ſubſtance diſcovered, prepared, and applied by Mr. Forſyth, for the purpoſe of removing diſeaſes, defects, and injuries in fruit and foreſt-trees. It is directed to be compoſed in the following manner, in his "Treatiſe on the Management of Trees."

"Take one buſhel of freſh cow-dung, half a buſhel of lime-rubbiſh of old buildings (that from the ceilings of rooms is preferable), half a buſhel of wood-aſhes, and a ſixteenth part of a buſhel of pit or river-ſand; the three laſt articles are to be ſifted fine before they are mixed; then work them well together with a ſpade, and afterwards with a wooden beater, until the ſtuff is very ſmooth, like fine plaſter uſed for the cielings of rooms."

It is adviſed that the trees ſhould be prepared for its application "by cutting away all the dead, decayed, and injured parts, down to the freſh ſound wood; leaving the ſurface of the wood very ſmooth, and rounding off the edges of the bark with a draw-knife, or other inſtrument, perfectly ſmooth, which muſt be particularly attended to; then lay on the plaſter about one eighth of an inch thick all over the part where the wood or bark has been ſo cut away, finiſhing off the edges as thin as poſſible: then take a quantity of dry powder of wood aſhes mixed with a ſixth part of the ſame quantity of the aſhes of burnt bones, put it into a tin box with holes in the top, and ſhake the powder on the ſurface of the plaſter, till the whole is covered over with it, letting it remain for half an hour to abſorb the moiſture; then apply more powder, rubbing it on gently with the hand, and repeating the application of the powder till the whole plaſter becomes a dry ſmooth ſurface."

And he adds the following directions.

" All trees cut down near the ground ſhould have the ſurface made quite ſmooth, rounding it off in a ſmall degree as before-mentioned; and the dry powder directed to be uſed afterwards, ſhould have an equal quantity of powder of alabaſter mixed with it, in order the better to reſiſt the dripping of trees and heavy rains."

Such parts or portions of the compoſition as may be left for a future uſe " ſhould be kept in a tub or other veſſel, and urine of any kind poured on them, ſo as to cover the ſurface; otherwiſe the atmoſphere will greatly hurt the efficacy of the application."

And " where lime-rubbiſh of old buildings cannot be eaſily got, take pounded chalk, or common lime, after having been ſlaked a month at leaſt."

It is further remarked by the author, that " as the growth of the tree will gradually affect the plaſter, by raiſing up its edges next the bark, care ſhould be taken, when that happens, to rub it over with the finger when occaſion may require (which is beſt done when moiſtened by rain), that the plaſter may be kept whole, to prevent the air and wet from penetrating into the wood."

But " as the beſt way of uſing the compoſition is found, by experience, to be in a liquid ſtate," Mr. Forſyth adviſes that it ſhould " be reduced to the conſiſtence of pretty thick paint, by mixing it up with a ſufficient quantity of urine and ſoapſuds, and be laid on with a painter's bruſh. The powder of wood-aſhes and burnt bones is to be applied as before directed, patting it down with the hand."

It is alſo further adviſed, that " when trees are become hollow, to ſcoop out all the rotten, looſe, and dead parts of the trunk to the ſolid wood, leaving the ſurface ſmooth; then to cover the hollow, and every part where the canker has been cut out, or branches lopped off, with the compoſition; and as the edges grow, to take care not to let the new wood come in contact with the dead, part of which it may be ſometimes neceſſary to leave; but to cut out the old dead wood as the new advances, keeping a hollow between them, to allow the new wood room to extend itſelf, and thereby fill up the cavity, which it will do in time, ſo as to make it as it were a new tree."

And if the cavity be large, to cut away as much at one operation as will be ſufficient for three years. But in this to " be guided by the ſize of the wound, and other circumſtances. When the new wood, advancing from both ſides of the wound, has almoſt met, to cut off the bark from both the edges, that the ſolid wood may join, which, if properly managed, it will do, leaving only a ſlight ſeam in the bark. If the tree be very much decayed, not to cut away all the dead wood at once, which would weaken the tree too much, if a ſtandard, and endanger its being blown down by the wind. It will conſequently be neceſſary to leave part of the dead wood at firſt, to ſtrengthen the tree, and to cut it out by degrees as the new wood is formed. If there be any canker, or gum oozing out, the infected parts muſt be pared off, or cut out with a proper inſtrument. When the ſtem is very much decayed and hollow, it will be neceſſary to open the ground and examine the roots." See DRESSING *of Trees*.

Various intereſting facts and obſervations on the advantage and utility of this compoſition in the removal of the diſeaſes of different ſorts of trees, may be ſeen below, as taken from Mr. Forſyth's valuable " Treatiſe on the Culture and Management of Fruit and Foreſt Trees."

It is ſtated by Mr. Forſyth as being " the received opinion and common practice of moſt profeſſional men, to prune or lop their trees, from the month of October, when the juices have been exhauſted by the ſummer foliage, autumnal fruit, and general nouriſhment of the body of the tree, until the month of March, when the ſap or juices, re-invigorated by nature during the winter's repoſe, begin to re-aſcend and perform the annual function of clothing it with freſh foliage, bloſſoms, and fruit. The reaſon of this practice is, he ſays, that the ſap being fallen at that ſeaſon of the year, it has been conſidered as the moſt proper period to lop off all ſuperfluous growths, and the efforts of nature to heal the wounds thus neceſſarily given (before the riſing of the ſap in the following ſpring), have been judged beſt for the ſafety and health of the tree. The danger of performing this ſervice when the juices are in a more vigorous flow, as in the months of May, June, and July, has been dreaded, from a fear of its occaſioning a waſte of the nutritive juices, diſcharging themſelves through the wound, to the impoveriſhment and injury, if not the ruin of the tree." And it is added, that " the pruning of fruit-trees, and the lopping off large branches from foreſt-trees during the winter ſeaſon, has alſo been frequently attended with great hurt and impediment to their health and vegetation; the wounds being expoſed to all the rigours of an inclement ſeaſon, and thereby contracting thoſe diſeaſes which contain the principles of decay. Hence it is, that ſuch numbers of foreſt-trees are continually injured in their value for public uſes, either by unſkilful management, or purpoſed depredation, or by the violence of boiſterous winds, when their limbs and branches being torn off, the trees are left in that unprotected ſtate to imbibe the ſeeds of decay and rottenneſs, which will in time pervade their very heart, and render them unfit for any of thoſe valuable purpoſes for which nature, by their frame and texture, appears to have deſigned them." And "it may alſo be obſerved, that where branches have been cut off from the body of the tree, even at the diſtance of two or more feet from the trunk, with a view to prevent injury to the timber, even that method has not been found effectual to ſave the tree from very material detriment; as the remaining ſtem of the branch ſo cut away, dying ſoon after, becomes a ready conduit for conveying pernicious moiſture and diſeaſe to that part of the tree with which it is connected; and ſo on, in time, to the whole."

But he ſuppoſes " the practice of others in lopping their trees cloſe to the trunk, and dreſſing the part ſmooth and even, has leſs objections than the former; nevertheleſs, even according to this method, the tree is liable to injury. The effort of nature to heal the wounds thus given, diſcovers itſelf by encircling the wound with a kind of callus or lip, which increaſing in ſize, and ſwelling out from the annual flow of the juices, forms a hollow or cavity of the central part, where the rain or ſnow is very apt to lodge; and penetrating between the bark and wood, dried and cracked by a hard froſt, or a warm ſun, promotes that fermentation with the natural juices, which is the certain ſource of diſeaſe and decay." It is ſuggeſted that " young, healthful, and vigorous trees, when they have been injured by being wantonly cut through the bark, or from other cauſes, will ſometimes recover themſelves, and, to all outward appearance, be reſtored to their original ſoundneſs; but when cut into planks and boards, internal blemiſhes and faults are diſcovered in them, which appear to have been occaſioned by the early injuries which the tree had received; the texture of the wood not uniting where the wound was originally given; though, from the youthful vigour of nature, the bark has cloſed, and an external cure been evidently performed on ſuch trees.

The compoſition is a moſt efficacious remedy to prevent theſe evils with all their deſtructive conſequences, and to reſtore ſound timber where the ſymptoms of decay are already apparent, which being applied in the manner directed, “to the wound or injured part, will infallibly prevent the bleeding of trees, or the oozing of juices through the wounds of limbs or branches that have been cut off in the middle of ſummer, when they are in their higheſt vigour, and moſt rapid flow of vegetation; by which means, any waſteful diſcharge of the juices is prevented, and they are duly confined to their natural operations of giving nouriſhment, growth, and fertility, to their reſpective bodies. By employing this remedy, trees of all kinds, whether in gardens or orchards, in parks or foreſts, may, he ſays, with greater ſafety and advantage be pruned or lopped in the ſpring, or early in the ſummer, than in the winter ſeaſon; as the compoſition, when properly applied, repels the flow of the juices through the wound, cauſes a more active vegetation, and aſſiſts nature more powerfully in healing the wound at the time the ſap is in full vigour, than when it is on the decline, as in autumn and winter ſeaſons.”

The writer conſiders it alſo neceſſary to remark, further, “that both fruit and foreſt-trees (particularly thoſe which grow in the ſhade) are very liable to be affected with diſorders proceeding from the growth of liverwort, and various kinds of moſs, that adhere to the outer bark of the tree, and frequently gain a conſiderable thickneſs, that not only prevents the natural flow of the juices, but cauſes a ſtagnation in the circulation and brings on decay; which, after deſtroying the outer bark, penetrates by degrees deeper into the wood. Where this circumſtance is obſerved, care ſhould be taken to clear the whole bark of the tree from theſe growths; and where it is infected, to ſcrape or pare it away. When the body of the tree is thus cleanſed from infection, the compoſition may be applied to the parts ſo cleanſed, to cloſe the pores of the wood; when the tree will ſoon acquire a freſh bark, and improved health and vegetation.”

The author is “confirmed in theſe opinions by the many experiments and various trials that he has made, to aſcertain, by the moſt poſitive proofs, the properties of this compoſition, before he ventured to offer it to the public attention.” “Indeed, every year's experience has increaſed his conviction of its general utility, when properly applied to the purpoſes for which it is recommended.” In order to give a more complete illuſtration of its virtues, and to place the advantages ariſing from it in a ſtronger light, he ſtates a few of the very numerous experiments that he has made on the foreſt-trees in his majeſty's gardens at Kenſington, where the ſalutary effects of it are extremely evident.

It is remarked that “the firſt trials of its efficacy were made on ſome very large and ancient elms, many of which were in a moſt decayed ſtate, having all their upper parts broken, by high winds, from their trunks, which were withal ſo hollow and decayed, that a ſmall portion alone of the bark remained alive and ſound. Of theſe trees he cut away at firſt a part only of the rotten ſtuff from the hollow of the tree, and then applied the plaſter to the place where the operation had been performed, by way of an internal coat. In a ſhort time, however, the efforts of nature, with a renovated flow of the juices, were clearly diſcernible in their formation of new wood, uniting with and ſwelling as it were from the old, till it became a ſtrong ſupport to that part of the tree where the compoſition had been applied. He then cut away more of the rotten wood from the inſide, applying the plaſter in the ſame manner, with the ſame good effects, and continued to uſe the knife in proportion to the acquiſition of new wood; ſo that from the tops of the decayed and naked trunks, ſtems have, he ſays, actually grown of about thirty feet in height, in the courſe of ſix or ſeven years from the firſt application of the compoſition; an incontrovertible proof of its good effects in reſtoring decayed vegetation in ſuch caſes.”

And he adds, that “many other elm trees, which had received hurts from bruiſes and other cauſes, and where diſeaſe and decay were already evident, after cutting away all the infected part, and duly applying the plaſter, were ſo completely healed, that the outline of the wound is ſcarcely diſcernible on the bark, and the new wood is as perfectly united to the old, as if it had been originally formed with the tree.”

It is ſtated that “of oak trees alſo, which had received very conſiderable damage from various accidents, as blows, bruiſes, and cutting of deep letters, the rubbing off of the bark by the ends of rollers, or wheels of carts, and mutilated branches, a perfect cure has been made, and ſound timber produced. The acidity, or corroſive quality of the juice of oak-trees, when obſtructed in their circulation from any of the cauſes already mentioned, and fermenting with the wet and moiſture imbibed by the wounds from the atmoſphere, will bring on diſeaſe, and promote decay; for, notwithſtanding the hard texture of the oak, when once the principles of decay begin to operate, the acrimonious juices feed the diſeaſe, and accelerate its progreſs, as much, perhaps, as in trees of a ſofter quality and texture, but when the diſeaſed or injured part is entirely cut away to the freſh ſound wood, and the compoſition properly laid on, as perfect a cure has been made as he has already related in the recovery of elm trees.”

The writer likewiſe further ſtates, that “various experiments have alſo been made on other foreſt trees, as aſh, limes, cheſnuts, and ſycamores, that had received the ſeveral injuries to which they are expoſed; as well as many of the reſinous kinds, ſuch as the cedar of Lebanon, and others of the pine tribe: in all of which he has experienced a degree of ſucceſs that exceeded his moſt ſanguine expectations. And as he feels a ſtrong ſolicitude to render his experiments of the moſt extenſive advantage to the community, and in particular to the proprietors of landed eſtates throughout the kingdom, he begs leave to recommend to their particular attention, that all foreſt trees, whether felled with a ſaw or an axe, may be cut near to the ground; at the ſame time carefully preſerving the ſtump and roots from any further injury. The ſurface may then be made quite ſmooth, and the compoſition be ſpread over the whole, according to directions already given. But in theſe caſes the compoſition ſhould have an equal quantity of the powder of alabaſter mixed with the dry powder generally directed to be uſed after it is laid on, in order to render the ſurface harder, and of courſe better able to reſiſt the bad effects of the dripping of trees, of rain, froſt, and ſnow; an addition which is by no means neceſſary in the uſual application to the ſides of trees.” He concludes that, “in conſequence of this proceſs, the vigour of the roots will operate ſo powerfully in the courſe of the ſucceeding ſpring, that a conſiderable number of buds or branches will ſhoot forth round the ſtump, which, with proper care and attention, may be trained to many valuable purpoſes, either ſtraight or crooked, for knee timber, or other uſes; and, by retaining only ſo many of theſe ſhoots as are deſigned to grow for any particular intention, more than one half will be ſaved, in point of time, according to the proportions of common growth; for, if a young tree be planted in a ſoil equal in quality to the ſtate of the old ſtump, the roots growing from the latter will, in eight or ten years, attain to a ſize which the ſingle plant will hardly acquire in twice that period. There are alſo many uſeful purpoſes of huſbandry, as hop-poles and other poles uſed on various occaſions, for which a number of ſhoots may be trained from one ſtump, whoſe fertile juices will ſhortly rear a healthy and numerous offſpring around it. Very particular attention, however, ſhould, he ſays, be paid to regulate the number, according to the ſize and vigour of the ſtump. It would certainly be proper to leave more of them at firſt than are intended to be reſerved for final uſe, in order to draw up the ſap; if too few are left, they will be liable to burſt, from the ſuperabundant flow of the juices from the old ſtock; to prevent which inconvenience they ſhould be cut away by degrees, always applying the compoſition as they are cut, and leaving the fineſt ſtem to produce the new tree, and will, in time, cover the old ſtump, and leave nothing but a faint kind of cicatrix at the junction of the old and new part of the tree."

He thinks it "needleſs for him to inſiſt on the great advantages which land proprietors and farmers will derive from this method of managing their woods and coppice-grounds, wherever they may be. In many counties of England, coppice, or underwood, is an article in very great demand for charcoal, common fuel, or the purpoſes of particular manufactories, as well as to furniſh a variety of articles for huſbandry and domeſtic conveniences." And its advantages in a national as well as ornamental point of view, are ſtill more obvious. See Canker.

Composition, in *Grammar*, denotes the joining of two words together; or prefixing a particle to another word, to augment, diminiſh, or change its ſignification. See Word, &c.

Composition, in *Law*, an agreement or contract made between the owner of lands and the parſon or vicar, with the conſent of the ordinary and the patron, that ſuch lands ſhall for the future be diſcharged from payment of tithes, by reaſon of ſome land or other real recompence, given to the parſon, in lieu and ſatisfaction thereof. Land may be exempted from the payment of tithes, where compoſitions have been made; and real compoſitions for tithes are to be made by the concurrent conſent of the parſon, patron, and ordinary. Real compoſitions are diſtinguiſhed from perſonal contracts; for a compoſition called a perſonal contract is only an agreement between the parſon and the pariſhioners, to pay ſo much inſtead of tithes: and though ſuch agreement is confirmed by the ordinary, yet (if the parſon be not a party) that doth not make it a real compoſition, becauſe he ought to be a party to the deed of compoſition. (Marſh's Rep. 87.) This kind of compoſition was permitted by law, becauſe it was ſuppoſed that the clergy would be no loſers by ſuch compoſition; ſince the conſent of the ordinary, whoſe duty it is to take care of the church in general, and of the patron, whoſe intereſt it is to protect that particular church, were both made neceſſary to render the compoſition effectual; and hence have ariſen all ſuch compoſitions as exiſt at this day by force of common law. But, experience ſhewing that even this caution was ineffectual, and the poſſeſſions of the church being, by this and other means, every day diminiſhed, the diſabling ſtatute 13 Eliz. c. 10, was made, which prevents, among other ſpiritual perſons, all parſons and vicars from making any conveyances of the eſtates of their churches, other than for three lives or twenty-one years. So that now, by virtue of this ſtatute, no real compoſition made ſince the 13th Eliz. is good for any longer term than three lives, or twenty-one years, though made by conſent of the patron and ordinary; which has, indeed, effectually demoliſhed this kind of traffic; ſuch compoſitions being now rarely heard of, unleſs by authority of parliament. See Modus.

Compoſition is ſometimes uſed for "deciſio litis." Accordingly compoſitions were anciently allowed for crimes and offences, even for murder. By this expedient it was propoſed to reſtrain the violence of private revenge. The cuſtom may be traced back to the ancient Germans (ſee Tacit. de Mor. German. c. 21.) and prevailed in other uncivilized nations. The nature of crimes and offences was eſtimated by the magiſtrate, and the ſum due to the perſon offended was aſcertained with a minute, and often a whimſical, accuracy. Rotharis, the legiſlator of the Lombards, who reigned about the middle of the 7th century, diſcovers his intention both in aſcertaining the compoſition to be paid by the offender, and in increaſing its value: it is, ſays he, that the enmity may be extinguiſhed, the perſecution may ceaſe, and peace may be reſtored. About the beginning of the 9th century, Charlemagne ſtruck at the root of the evil, and enacted, "that when any perſon had been guilty of a crime, or had committed an outrage, he ſhould immediately ſubmit to the penance which the church impoſed, and offer to pay the compoſition which the law preſcribed, and if the injured perſon or his kindred ſhould refuſe to accept of this, and preſume to avenge themſelves by force of arms, their lands and properties ſhould be forfeited. Tavernier relates, that in Perſia, a murderer is ſtill delivered to the relations of the perſon whom he has ſlain, who put him to death with their own hands; and if they refuſe a ſum of money as a compenſation, the ſovereign cannot pardon the murderer. Monteſq. Sp. of Laws, vol. ii. p. 382. Robertſon's Hiſt. of Ch. V. vol. i. p. 334, &c.

Composition, in *Logic*, is a method of reaſoning, wherein we proceed from ſome general ſelf-evident truth, to other particular and ſingular ones.

The method of compoſition, called alſo *ſyntheſis*, is juſt the reverſe of that of reſolution, or *analyſis*.

Reſolution is the method whereby we ordinarily ſearch after truth; compoſition, that whereby a truth found, is diſcovered and demonſtrated to others; reſolution is the method of inveſtigation; compoſition, of demonſtration.

The method of compoſition is that uſed by Euclid, and other geometricians; reſolution, that uſed by algebraiſts and philoſophers. The two methods differ, juſt as the methods of ſearching a genealogy; which are either by deſcending from the anceſtors to the poſterity, or by aſcending from the poſterity to their anceſtors: each have this in common, that their progreſſion is from a thing known, to another unknown.

The method of compoſition is beſt obſerved by the mathematicians: the rules which are, 1. To offer nothing but what is couched in clear and expreſs terms; and to that end, to begin with definition. 2. To build only on evident and clear principles; to that end, to proceed from axioms or maxims. 3. To prove demonſtratively all the concluſions that are drawn hence; and to this purpoſe, to make uſe of no arguments or proofs, but definitions already laid down, axioms already granted, and propoſitions already proved; which ſerve as principles to things that follow.

Composition *of ideas*, is an operation of the mind, whereby it combines ſeveral of its ſimple ideas into complex ones.

Under the ſame operation may likewiſe be reckoned that of enlarging; whereby we put ſeveral ideas together of the ſame kind, as ſeveral units to make a dozen.

In this, as in others, brutes come far ſhort of men; for though they take in and retain ſeveral combinations of ſimple ideas; as poſſibly, a dog does the ſhape, ſmell, and voice of his maſter; yet theſe are rather ſo many diſtinct marks whereby he knows him, than one complex idea, made out of thoſe ſimple ones.

An ingenious writer has ſuggeſted the impropriety of the phraſe "compoſition of ideas," adopted by Mr. Locke, alleging it is merely a contrivance of language, and that the only compoſition is in the terms; and that it is as improper to ſpeak of a complex idea, as it would be to call a conſtellation a complex ſtar. He further adds, that they are not ideas, but merely terms, which are general and abſtract. Whatever, he ſays, the immortal author of the "Eſſay on Underſtanding," has juſtly concluded in his reaſoning on this ſubject will hold equally true and clear, if we ſubſtitute the compoſition, &c. of terms, wherever he has ſuppoſed a compoſition, &c. of ideas. If upon ſtrict examination this ſhould appear to be the caſe, we ſhall need no other argument againſt the compoſition of ideas: it being exactly ſimilar to that unanſwerable one which Mr. Locke himſelf declares to be ſufficient againſt their being innate. For the ſuppoſition is unneceſſary: every purpoſe for which the compoſition of ideas was imagined being more eaſily and naturally anſwered by the compoſition of terms; whilſt at the ſame time it likewiſe clears up many difficulties, in which the ſuppoſed compoſition of ideas neceſſarily involves us. This writer further adds, that it is an eaſy matter, upon Mr. Locke's own principles, and a phyſical conſideration of the ſenſes and the mind, to prove the impoſſibility of the compoſition of ideas. Tooke's Diverſions of Purley, pt. i. p. 37, &c.

Composition, in *Mathematics*, is the taking of a given number of quantities, out of as many equal rows of different quantities, one out of every row; and combining them together. Here no regard is had to their places; and it differs from combination, in which there is but one row of things.

I. "The number of compoſitions of n things taken out of n rows, each row conſiſting of m things, is m^n, or the n^{th} power of m."

Let there be any number of rows, ſuch as thoſe annexed. It is plain the number of ſingle things as a, b, c, d, is m or m^1.

$$\left.\begin{array}{l}\\ \\ \end{array}\right\} \begin{array}{llll} a, & b, & c, & d, \\ e, & f, & g, & h, \\ i, & k, & l, & m. \end{array}$$

Then the number of combinations of every 2 is had by joining each quantity in the ſecond row to all the quantities in the firſt, which will make as many times m as there are things in the ſecond row, or m times m, that is m^2, for all the two's. Again, taking in the third row; there will be as many times m^2, as there are things in the third row, that is, m times mm, or m^3, for the compoſition of three things.

After the ſame manner, if a fourth row was taken in; all the combinations of every four would be m^4, and ſo on: and, therefore, univerſally, when n rows are taken in, the number of combinations will be m^n, which is the number of compoſitions. Hence it follows, 1. That the number of compoſitions of all the one's, two's, three's, &c. to n, is $\frac{m^n - 1}{m - 1} m$. For $\frac{m^4 - 1}{m - 1} = m^3 + m^2 + m + 1$. And $\frac{m^4 - 1}{m - 1} m = m^4 + m^3 + m^2 + m$, as will appear by diviſion, or, in general, $\frac{m^n - 1}{m - 1} m = m^n + m^{n-1}$, &c. to m = compoſitions of all the one's, two's, three's, &c. to n.

2. Hence may be found the compoſition of n things out of m, as follows: Involve m to the n^{th} power for the anſwer.

E. G. 1. How many compoſitions may be had, of 3 letters out of 20?

Anſ. $20^3 = 8000$. In this caſe there ſhould be three different alphabets.

E. G. 2. How many changes are there on throwing four dice?

Anſ. $6^4 = 1296$.

II. "If there be m rows of quantities given, having the ſame quantities, and the ſame number of them, as a, b, c, d, &c. to find the number of compoſitions of m things taken out of the m rows; for any given form of theſe quantities, as $a^t\, b^v\, c^w\, d^x$, &c.

Rule. Put V = variations of the things $a^t\, b^v\, c^w\, d^x$; and A = variations or alternations of the indexes, t, v, w, x. (See Changes and Permutation.) Then will AV = the number of compoſitions required.

For let the different rows in the laſt propoſition be made all alike, or the firſt row m times repeated, as here. And let the number of things propoſed be $a^3\, b^2\, c$, and firſt let the index 3 be fixed to a and 2 to b, &c. Now, ſince a^3 may be taken out of any three rows, and b^2 out of any two remaining rows;

$$\left.\begin{array}{l}\\ \\ \\ \\ \\ \\ \end{array}\right\} \begin{array}{llll} a, & b, & c, & d, \\ a, & b, & c, & d, \\ a, & b, & c, & d, \\ a, & b, & c, & d, \\ a, & b, & c, & d, \\ a, & b, & c, & d, \\ a, & b, & c, & d. \end{array}$$

and c out of the laſt remaining row; therefore, there will be ſo many ways of taking theſe letters, as each of them can be placed in different rows, that is, in different places or ſituations; for the varying of the rows is the ſame thing as the varying of the places of the letters; and, conſequently, the different ways of taking them out of the ſeveral rows is equal to the number of variations or permutations of theſe letters; which number is = V. And this will hold as long as the indexes are fixed to theſe particular letters, and to none elſe. But ſince, in any one form, as $a^3\, b^2\, c$, that form will comprehend as many caſes as there can be variations in ſhifting the indexes from one letter to another; therefore, there will be ſo many times V, as is the number of theſe variations. Therefore, if A be = the number of variations, or alternations, of the indexes, 3, 2, 1; or, in general, of t, v, w, x; then AV will be the whole number of compoſitions, which that particular form will admit of.

Hence, 1. In any $a^t\, b^v\, c^w\, d^x$, where the indexes are fixed invariably to their particular letters; the number of compoſitions V will be $= \frac{1 \times 2 \times 3 \times 4 \ldots\text{ to } m}{1 . 2 . 3 \ldots t \times 1 . 2 . 3 \ldots\text{ to } v \times \text{\&c.}}$

2. If n = the number of different letters in any form, $a^t\, b^v\, c^w\, d^x$, &c.; then the whole number of compoſitions for that form will be $= \frac{1 . 2 . 3 \ldots\text{ to } n}{\text{RS, \&c.}}$ $\frac{1 . 2 . 3 \ldots\text{ to } m}{1 . 2 \ldots t \times 1 . 2 \ldots v \times \text{\&c.}}$ where R = 1 . 2, or 1 . 2 . 3, &c. according as any index is twice or thrice, &c. repeated; and the like for S, and ſo on.

E. G. 1. How many compoſitions are in the form $a^3\, b^2\, c$? Here $n = 3$, $m = 6$, $t = 3$, $v = 2$, $w = 1$: and in this caſe there is no repetition of indexes.

Anſ. $1 . 2 . 3 \times \frac{1 . 2 . 3 . 4 . 5 . 6}{1 . 2 . 3 \times 1 . 2} = 6 \times 60 = 360.$

E. G. 2. How many compoſitions are in the form $a^2\,b^2\,c$? Here $n = 3$, $m = 5$, $t = 2$, $v = 2$, $w = 1$. The index 2 is twice repeated.

Anſ. $\frac{1 . 2 . 3}{1 . 2} \times \frac{1 . 2 . 3 . 4 . 5}{1 . 2 \times 1 . 2} = 3 \times 30 = 90.$

E. G. 3. To find the compoſitions in the form $a^3\,b^3$. Here $n = 2$, $m = 6$, $t, v = 3$, $w = 0$. The index 3 is twice repeated; and the letters *a, b* thrice.

Anſ. $\frac{1 . 2}{1 . 2} \times \frac{1 . 2 . 3 . 4 . 5 . 6}{1 . 2 . 3 \times 1 . 2 . 3} = 1 \times 20 = 20.$

E. G. 4. To find the number of compoſitions of the form $a^3\,b^3\,c^2\,d^2$. Here $n = 4$, $m = 10$, $t, v = 3$, $w, x = 2$. The index 3 is twice repeated, and alſo the index 2. The letters *a, b* are thrice repeated; and *c, d* twice.

Anſ. $\frac{1 . 2 . 3 . 4}{1 . 2 \times 1 . 2} \times \frac{1 . 2 . 3 . 4 . 5 . 6 . 7 . 8 . 9 . 10}{1 . 2 . 3 \times 1 . 2 . 3 \times 1 . 2 \times 1 . 2} = 6 \times 25200 = 151200.$

E. G. 5. How many compoſitions in the form $a^5\,b^3\,c^3\,d\,e\,f$? Here $n = 6$, $m = 14$, $t = 5$, $v, w = 3$, $x = 1$. The index 3 is twice repeated, and the index 1 thrice: the letter *a* five times repeated; and *b* and *c* thrice.

Anſ. $\frac{1 . 2 . 3 . 4 . 5 . 6}{1 . 2 . 3 \times 1 . 2} \times \frac{1 . 2 . 3 . 4 . 5 . 6 . 7 . 8 . 9 . 10 . 11 . 12 . 13 . 14}{1 . 2 . 3 . 4 . 5 \times 1 . 2 . 3 \times 1 . 2 . 3} = 60 \times 20180160 = 1210809600.$ So prodigiouſly do the numbers increaſe in theſe operations. See Combination and Composite *numbers*.

Composition *of motion*, in *Mechanics*, is an aſſemblage of ſeveral directions of motion, reſulting from powers acting in different, though not oppoſite lines.

If a point move or flow according to one and the ſame direction, whether that motion be equable or not, yet it will ſtill keep the ſame right line; the celerity alone being changed, *i. e.* increaſed, or diminiſhed, according to the forces with which it is impelled. If the directions be oppoſite, as one, *e. gr.* directly downward, the other upward, &c. yet ſtill the line of motion will be the ſame.

But if the compounding motions be not according to the ſame line of direction, the compound motion will not be according to the line of direction of any of them, but in a different one from them all; and this either ſtraight or crooked, according as the direction or celerities ſhall require.

If two compounding motions be each of them equable, the line of the compound motion will ſtill be a ſtraight line; and this, though the motions be neither at right angles one to another, nor equally ſwift, nor (each to itſelf) equable; provided that they be but ſimilar; that is, both accelerated and retarded alike.

Thus, if the point *a* (*Pl.* XV. *Mechanics. fig.* 1.) be impelled equally with two forces; *viz.* upwards, towards *b*, and forwards, towards *d*; it is plain, that when it is gone forwards as far as *a c*, it muſt of neceſſity be gone upwards as far as *c e*; ſo that were the motions both equable, it would always go on in the diagonal *a e c*.

Nay, ſuppoſe the motions unequal as to celerity, ſo, *v. gr.* as that the body move twice as faſt upwards as forwards, &c. yet ſtill it muſt go on in the diagonal *a c*; becauſe the triangles *a e c, a e c,* &c. and *a c d* will ſtill be ſimilar, being as the motions are: and it will have deſcribed the diagonal in the ſame time which it would have required to deſcribe either of the ſides ſingly.

But, if the motions be diſſimilar, then the *compound* motion muſt be a curve.

And, if a body, as *b* (*fig.* 2.) be impelled or drawn by three different forces, in the three different directions *b a, b c,* and *b d,* ſo that it yields to none of them, but continues in *æquilibrio*: then will thoſe three powers or forces be to one another, as three right lines drawn parallel to thoſe lines, expreſſing the three different directions, and terminated by their mutual concourſes.

Let *b e* repreſent the force by which the body *b* is impelled from *b* to *a*; then will the ſame right line *b e* repreſent alſo the contrary equal force, by which it is impelled from *b* to *e*: but by what hath been ſaid before, the force *b e* is reſolvable into the two forces acting according to the two directions *b d* and *b c*, to which the other impelling from *b* to *e*, is as *b e* to *b d*, and *b c* or *de*, reſpectively.

So likewiſe two forces, acting without the directions *b d, b c,* and being equipollent to the force acting without the direction *b c*, from *b* to *e*; will be to the force acting according to the direction *b e*, from *b* to *e*, as *b d, b c,* to *b e*: and therefore, the forces acting in the directions *b d, b c,* and equipollent to the force acting in the direction *b e*, are to the force acting in the direction *b e*, as *b d, b c,* or *de,* to *b e*: that is, if a body be urged by three different equipollent powers in the directions *b a, b d,* and *b c*; theſe three forces ſhall be to one another as *b e, b d,* and *d e*, reſpectively.

This theorem, with its corollaries, Dr. Keill obſerves, is the foundation of all the new mechanics of M. Varignon: by help of which may the force of the muſcles be computed, and moſt of the mechanic theorems in Borelli, De Motu Animalium, be immediately deduced. See Motion.

Composition *of proportion*.—If there be two ratios, wherein the antecedent of the firſt is to its conſequent, as the antecedent of the other is to its conſequent; then, by compoſition of proportion, as the ſum of the antecedent and conſequent of the firſt ratio, is to the antecedent, or the conſequent, of the firſt; ſo is the ſum of the antecedent and conſequent of the ſecond ratio, to the antecedent, or the conſequent, of the ſecond.

E. gr. If A : B : : C : D; then by compoſition, A+B : A or (B) : : C+D : C or (D). See Proportion.

Composition *of ratios*, in *Arithmetic* and *Algebra*, is performed by multiplying the quantities or exponents of two or more ratios together; the product is then ſaid to be compounded of the ratios whoſe components were multiplied. Thus, if the quantities or exponents of the ratios *a* to *b*, *c* to *d*, *e* to *f*, be multiplied, we ſhall have $\frac{a}{b} \times \frac{c}{d} \times \frac{e}{f} = \frac{ace}{bdf}$. And the ratio *a c e* to *b d f*, is then ſaid to be compounded of the ſeveral ratios *a* to *b*, *c* to *d*, *e* to *f*, &c. Thus alſo the ratio of 10 to 12, is compounded of the ratio 2 to 3, and of 5 to 4; for $\frac{2}{3} \times \frac{5}{4} = \frac{10}{12}$.

This operation is by ſome called *addition* of ratios. See Ratio.

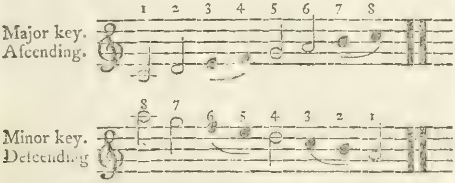
Composition, in *Muſic*, implies harmony, muſic in different parts, according with each other; and by the mixture of concords and diſcords embelliſhing melody, and communicating at once, to a well organized ear, the double delight ariſing from the union of the two great conſtituent ingredients in muſic, Melody and Harmony. To be able to write down or dictate a melody or ſingle part, does not exalt its author to the rank of compoſer; though many have aſſumed that title, who have not been poſſeſſed of ſcience ſufficient to make a baſe to a ballad or minuet.

As the term *compoſition* implies the union of various ingredients we ſhall endeavour in the important article Counterpoint,

TERPOINT, from our own knowledge, and from the precepts and practice of the greateſt maſters of the art, to deſcribe theſe ingredients, and point out their legitimate uſe. See COUNTERPOINT, which is ſo nearly ſynonymous with *Compoſition*, that we know not how to ſeparate them.

We take it for granted, before a muſical ſtudent is inflamed with the ambition of becoming a *compoſer*, that he is perfectly acquainted with the elements of the art; that he has read, or at leaſt heard, the principal productions of great maſters; that he knows intervals, and their relation to the key note and diſtance from every other ſound of the ſcale. See SCALE and INTERVAL. That he knows the different meaſures or kinds of time in muſic, nor is unacquainted with rhythm, nor where the accents of each bar ſhould be placed. See TIME, ACCENT, and MEASURE. That he knows and feels the difference between concords and diſcords; is offended with falſe intonation, and inſtruments out of tune; feels ſomething wrong in the regular ſucceſſion of two ſharp 3ds or 6ths; two 5ths or two common chords riſing or falling one degree; that he knows the compaſs and genius of the voice or inſtrument for which he writes. But we muſt not take too much for granted, or, in order to ſave ourſelves trouble, teaze our readers with too many references to articles connected with *compoſition*; we ſhall therefore refer our readers to the article *Counterpoint*. (which we have laboured with great zeal) for the mechanical rules of compoſition; firſt reminding the young ſtudent, that the ſcale of eight notes aſcending and deſcending, which repreſents the whole ſyſtem in a major key, conſiſts of 5 tones and 2 ſemitones, the 8th note being a recurrence of the ſame letter, and nearly the ſame ſound, is included in the ſame harmony as the key note or principal baſe.

Keys are denominated major or minor, ſharp or flat, from the ſituation of the ſemitones. Let C ♮ repreſent all major keys, and A ♮ the minor. In the major keys, the two ſemitones lie from the 3d to the 4th, and 7th to the 8th; and in minor keys, from the 2d to the 3d, and 5th to the 6th, aſcending in the major, and to avoid accidental ſharps, deſcending in the minor, thus:



A ſharp or flat at the clef, or an accidental ſharp or flat in the middle of a melody, changes the place of the firſt ſemitone; and two ſharps or two flats change the place of both,

Of theſe eight notes, ſome are termed *concords*, and ſome *diſcords*. Of the concords, ſome are *perfect*, and cannot be changed by an accidental ſharp or flat, without becoming diſcords. Theſe are the 4th, 5th, and 8th, which furniſh, when uſed in the lower part of the ſcale, a baſe to the regular aſcent in the treble. See SCALE, FUNDAMENTAL BASE, and COMPOSER.

COMPOSITION, in *Oratory*, the order and coherence of the parts of a diſcourſe.

As a part of general *elocution*, (which ſee) it regards the turn and harmony of the periods: and therefore to *compoſition* belong, both the artful joining of the words, whereof the ſtyle is formed, and whereby it is rendered ſoft and ſmooth, gentle and flowing, full and ſonorous; or the contrary: and the order, which requires things firſt in nature and dignity, to be put before thoſe of inferior conſideration.

Compoſition conſiſts of four parts; which rhetoricians call PERIOD, ORDER, JUNCTURE, and NUMBER, which ſee reſpectively. Ward's Oratory, vol. i. p. 340.

COMPOSITION, in *Painting*, is that great and important requiſite, the knowledge of which enables the artiſt to diſpoſe all the various objects in his picture, as required by the ſubject, and furniſhed by the imagination or invention, in ſuch a manner as to render them, individually and collectively, moſt conducive to the beauty, the effect, and the expreſſion of the whole work. The objects furniſhed by the imagination or invention, may be conſidered as ſo many unmanufactured materials, which the ſcience of compoſition teaches us to work up and diſplay, as the peculiar circumſtances of each caſe may require. Compoſition, in its general ſenſe, may, therefore, be ſtyled the ground-work of painting, upon which the ſuperſtructure, expreſſion, deſign, chiaro-ſcuro, and colouring, in a greater or leſs degree depend; and the ſcience of it opens a wide field for our conſideration, as it ſuppoſes not only the knowledge of all the various combinations or contracts of lines and forms, which are calculated to produce agreeable or ſtriking effects in general, but likewiſe, that judicious choice in their ſelection which may be moſt applicable to the diſtinguiſhing character and expreſſion of each ſubject or work in particular. Compoſition, thus contemplated, is no longer confined to the artificial pyramid or the forced contraſt, but embraces every poſſible diverſity of arrangement and diſtribution, from the artleſs ſimplicity of Giotto and Maſaccio, to the moſt ſtudied and complex grouping of Buonarotti and Rubens.

In treating this ſubject we ſhall follow the ſame method which we purſued in our inquiries reſpecting clair-obſcure and colouring. We ſhall commence by taking a curſory view of the ſtyle of the firſt reſtorers of painting, then trace the principles and ſyſtems of compoſition at different periods introduced by their ſucceſſors, and conclude by recommending ſuch examples, and ſuch precepts, as we conceive may be moſt calculated to inſure the ſtudent's improvement.

The efforts of the early artiſts, Cimabue, Giotto, and their ſchool, were entirely directed to one great point, the appropriate expreſſion of the ſtory to be repreſented; every kind of artifice was to them unknown, and their pictures may be compared to the ſimple unembelliſhed diction of the rude but faithful hiſtorian, or to the wild but uncouth ſtrains of the untutored muſe. Theſe old painters, in their ſcriptural or eccleſiaſtic repreſentations in the churches of Italy, ſeem to have conſidered the art in no other light than as a means by which to conduce to the devotion of the people, and as they really believed the truth of thoſe ſtories which they endeavoured to repreſent, (upon which perhaps a great deal depends), ſo they deſcribed every incident exactly as they ſuppoſed, or had been taught by tradition to believe, it had taken place. In their pictures of the Madonna, ſtyled in the Roman church, the Mother of God, and in their attempts to give the image of that eternal being which man never ſaw, the effect was rendered more awful and impreſſive by the introduction of choirs of angels and ſaints, in regular order, diſpoſed on each ſide and behind the throne; a more pictureſque diſtribution of figures may be found, it is true, in the large altar pictures of the more modern painters, Carlo Maratti, Luca Giordano, and others; but then ſolemnity and dignity are ſacrificed, where the Virgin Mary, with the ſaints and angels, her attendants, ſeem huddled together with as little decorum, as if a group of beggar children, at play in the ſtreet, had been the ſubject to be repreſented.

In all thoſe pictures of the old painters, which may be more particularly ſtyled devotional, we perceive an attempt to elevate the mind of the ſpectator to the contemplation of celeſtial enjoyments; in the pictures of the moderns, beginning from the death of the divine Raffaele, artifice is too apparent, and the ſubject ſeems too frequently to have been made ſubſervient to the deſire of the painter to diſplay his own academic acquirements. Nature alone ſeems to have been the preceptreſs of the old painters in compoſition, and hence that variety, and at the ſame time that ſimplicity in their works which we ſo much admire; but as they were extremely deficient in many neceſſary parts of the art, and particularly in theſe three, drawing, perſpective, and clair-obſcure, it is not ſurprizing if, in the eyes of curſory obſervers, their pictures have alone to boaſt the merit of antiquity, and that intereſt which is neceſſarily attached to the early efforts of man in every branch of ſtudy.

Inſtances, however, may be found, even in the works of the oldeſt painters, of compoſitions uniting at once propriety of expreſſion, with beauty of diſpoſition: amongſt the numerous freſcoes of Cimabue ſtill remaining in the church of St Francis, at Aſſiſi, there is in particular one, repreſenting a dead Chriſt with the Marys and other figures, where, the ſubject naturally allowing of it, the artiſt has given ſuch an agreeable form to the groups, by introducing around the recumbent figure of our Lord, the varied attitudes of figures kneeling and ſtanding, as to leave little to be deſired, ſave a greater perfection in the executive and mechanical parts of the art.

The works of Giotto, the ſcholar of Cimabue, may be ſtudied with abundant advantage as to invention and compoſition. The church of Aſſiſi, above-mentioned, poſſeſſes an extenſive ſeries of the freſcoes of this extraordinary child of nature, repreſenting ſtories of the life and miracles of St. Francis; here the compoſitions, though ever ſubſervient to the expreſſion of their ſubjects, are in ſome inſtances ſo beautifully grouped, as to leave it almoſt doubtful whether, in this reſpect, they ever were ſurpaſſed even by the beſt artiſts of later periods. One of theſe repreſents the ſtory of a nobleman of diſſolute character, who having heard of the fame of St. Francis, invited him and his companion, another friar, one day to his table. The holy converſation of the ſaint had ſuch influence on the nobleman, that he made to him a full and contrite confeſſion of his ſins, when, after receiving abſolution, he inſtantly fell down and expired. Giotto has ſeized this moment. The women, relatives of the deceaſed, the attendants, all flock, with varied expreſſions of grief, aſtoniſhment, and terror, to the corner of the picture where he lies; an elderly man, (thereby forming the connection between this group and the other) is repreſented imploring the interpoſition of St. Francis, who, riſing from his ſeat, ſeems to pity their ſorrow, at the ſame time that he endeavours to aſſuage it by the conſolatory aſſurance that the ſins of their maſter are forgiven, and that his ſpirit is in peace. The friar alone, accuſtomed to behold miracles, ſits unmoved.

In another of theſe freſcoes, Giotto has repreſented the moment, when, after the death of St. Francis, his body was carried, in the way to the place of burial, to the convent of Sta. Clara. The bearers of the body, ſurrounded by a concourſe of people, have reſted the bier on the ground: Sta. Clara is taking a laſt look at the face of him, who, in her youth, ſhe ſo much loved, one of the nuns is kiſſing the feet of the departed ſaint, a ſecond bathes his hand with her tears, whilſt others, with a gracefulneſs and tenderneſs of expreſſion not to be ſurpaſſed, are advancing from the three doors of the church to pay theſe laſt duties to the object of their affection and veneration. The church itſelf, beautifully enriched with alto-relievos, gives the moſt agreeable termination to the group.

We ſhall mention one more of this ſeries of pictures, which, though not in point of beauty equal to the two firſt deſcribed, is applicable to our preſent purpoſe as it ſtrongly exemplifies how much a proper diſpoſition of the groups in a picture contributes to the expreſſion of the ſubject. The ſtory repreſented is a miracle which took place ſome time after the death of St. Francis.

A woman from ſome cauſe or other died without making a full confeſſion; ſhe had, however, upon the whole been a good catholic, and eſpecially devoted to St. Francis; the ſaint therefore made interceſſion for her, and when the prieſt with his attendants were upon the point of carrying the body to the grave; ſhe, to the great aſtoniſhment of all preſent, ſat up, called a confeſſor who was preſent by name, revealed to him her hidden ſins, and then once more died and was buried. In the middle of the picture is repreſented the woman ſitting up on her bed, in the act of confeſſing to a friar, who at once unites in his countenance the ſtrongeſt expreſſion of terror with the moſt earneſt attention; ſome women, the friends of the deceaſed, and a child, form a group on the right; the prieſt and his attendants are on the left; both theſe groups are kept at a diſtance from the two principal figures, in the centre, by which the idea of ſecret confeſſion, a leading point in the ſtory, is more decidedly given, than could have been accompliſhed by any other manner of placing the figures. The interceſſion of St. Francis to our Saviour is repreſented in the ſky; and a little below, the effect of that interceſſion is unequivocally deſcribed, by the introduction of a celeſtial agent, who is driving before him the infernal ſpirit, by which the woman is ſuppoſed to have been poſſeſſed.

Amongſt the principal ſcholars of Giotto we may enumerate, Taddeo Gaddi, and Puccio Capanna: of the former many admirable freſcoes are ſtill exiſting in the church and ſacriſty of Sta. Croce, and in the cortile of Sta. Maria Novella at Florence, and of the latter, great part of the roof or vault, beſides two excellent compoſitions of the taking down from the croſs and the burial of Chriſt, on the ſide wall of the lower church of St. Francis at Aſſiſi.

However, the ſchool of painting founded by Cimabue and Giotto, continued with but little variation or advancement, till about 1430, when Maſaccio diſtinguiſhed himſelf by a correctneſs and perfection of imitation, hitherto unknown. He began to ſhew a juſt notion of perſpective, and firſt ſucceeded in fore-ſhortening the feet of his figures, ſo as to give them the true appearance of ſtanding on an horizontal plane; a difficulty never ſurmounted by his predeceſſors, whoſe figures, except when in profile, ſeemed generally, as if ſtanding on tip-toe. He gave a great breadth of light and ſhadow to his groups, and was an excellent colouriſt, and the heads of his figures are ſo finely drawn, ſo full of nature, and finiſhed with ſuch a delicacy and at the ſame time ſuch a mellowneſs of pencil, as to be ſcarcely ſurpaſſed by the fineſt portraits of Raffaele, Titian, or Del Sarto. In all the executive parts of the art, Maſaccio eminently excelled; but we cannot join in the opinion of thoſe who conſider him as having equally contributed to the advancement of compoſition: his aim was to make the moſt correct poſſible tranſcript of the model before him;

hence his freſcoes, in the celebrated chapel at the Carmine, abound with admirable repreſentations of his friends and cotemporaries, portraits that ſeem almoſt alive, but they are not always alive to the ſubject, nor do they expreſs by their actions or geſtures, thoſe feelings which the act of which they are repreſented as ſpectators, ſhould naturally awaken in them; in the miracle of the boy reſtored to life by St. Peter, and in the martyrdom of the ſame ſaint, the ſurrounding figures ſeem no more affected than ſo many indifferent perſons met together in the market place, to talk over the ordinary news of the day. However this work of Maſaccio greatly contributed to haſten the great æra of painting which followed, by exhibiting to contemporary and ſucceeding artiſts, a model much more perfect, at leaſt as to the executive parts of the art, than they had hitherto been accuſtomed to contemplate. Much has been ſaid as to the plagiariſms of Raffaele from this work. The Adam and Eve driven out of paradiſe in the Loggia of the Vatican, is certainly an improved tranſcript of that of Maſaccio, and the Saint Paul preaching at Athens in the cartoon, bears ſome reſemblance, it muſt be allowed, to the figure of the ſame ſaint viſiting St. Peter in priſon in Maſaccio's chapel; but if Maſaccio furniſhed the body of the ſaint, it was neceſſary that the great Raffaele ſhould animate it with the energy of his own ſoul, ere it could convey the idea of that irreſiſtible torrent of eloquence, by which the apoſtle combatted and overthrew the ſophiſms and ſuperſtitions of his audience at the Areopagus.

The immediate followers of Maſaccio were blind to his greateſt excellence, and inſtead of that mellowneſs and breadth which we find in his works, adopted a ſtyle of execution more crude and unharmonious, than even that of the more early painters; deſign, however, made a rapid advancement, which, added to a competent knowledge of perſpective, now become general, gave to Lûca Signiorelli, and others of genius, the means of embodying thoſe bold conceptions, which as yet no one had hoped to tranſmit to the canvaſs.

The chapel which Signiorelli painted in the cathedral church of Orvieto with ſtories of the End of the World, the Laſt Judgment, Paradiſe, Hell, &c. is fraught with the moſt novel and daring fore-ſhortenings, energetic expreſſions and finely contraſted groups, inſomuch that the great Michelangelo, is ſaid to have derived benefit from the ſtudy of this work, previous to his painting the celebrated Laſt Judgment in the papal chapel at Rome.

In this work, however, the compoſition, though fine in its ſeparate parts or groups, is not always judicious in the whole; that eſſential part of theory, which teaches the artiſt the policy or neceſſity of making many ſmall parts of his picture ſubordinate to the principal figure or chief group, yet remained to be known, nor was it for a long time ſufficiently underſtood, that the great diſtinguiſhing prerogative of painting, and that from which ariſes its decided advantage over every other artificial mode of repreſentation, is its power to give upon a limited plane the appearance of boundleſs ſpace. Thus, in thoſe two compartments in particular, in which the artiſt has repreſented Paradiſe and Hell; much effect is loſt by the figures and groups being ranged as it were in one line parallel to the plane of the picture; and this ſeems the more ſurprizing, as in one or two of the other compartments, and eſpecially in that deſcribing the End of the World, and the Deſtruction of the Wicked by Fire from Heaven, a moſt happy and ſtriking diſtribution of the figures into different groups, and on different planes and diſtances, is to be obſerved.

Of Domenico Ghirlandajo, the maſter of Michelangelo in his youth, it may be well to note, that although he merited, in the opinion of many, the reputation of being the beſt painter of his time, yet the ſtyle of compoſition adopted by him in his great work in the tribuna of the church of Sta. Maria Novèlla at Florence, is by no means ſuch as to rank him amongſt thoſe artiſts whoſe performances may be ſtudied with profit, as to the branch of art we are now treating of; unleſs, indeed, that the contemplation of their manifeſt faults in this particular, may tend to deter the ſtudent from purſuing a ſimilar line of conduct. The ſubject is here made ſubſervient to the rage of the painter for diſplaying his talents in portrait; theſe freſcoes containing ſtriking reſemblances of almoſt every lord, lady, or literary character of diſtinction of his time; and as the figures are throughout dreſſed in the dreſſes of the time, ſo this work is valuable, as giving perhaps the beſt idea of the coſtume of Florence towards the end of the fifteenth century, of any in exiſtence; add to this, that the whole is admirably executed; but the ſpectator may long dwell on the various beauties of this work ere he diſcovers that it is intended to repreſent the principal ſtories of the New Teſtament!

The happy æra was, however, faſt approaching, when the profound Lionardo, the great Michelangelo, and the divine Raffaele, were deſtined, not only to unite all the various excellencies of the old painters, but likewiſe, by an unparalleled and happy exertion of comprehenſive and elevated genius, at once to carry all thoſe parts of the art, which moſt ennoble it, to a height of perfection beyond which the efforts of ſucceeding artiſts have never enabled them to reach; if indeed they have ever approached it in the four great points of invention, compoſition, expreſſion, and deſign.

It was about the year 1503 that the Florentines formed the idea of decorating their great hall of council with productions of the pencil. Upon this occaſion Lionardo da Vinci executed in a cartoon the aſtoniſhing Group of Horſemen fighting for the Standard, ſo well known by the fine print of Edelink; a compoſition replete, but not crowded, and which exhibits the utmoſt energy of action, without extravagance, and the moſt ſtriking and beautiful variety of contraſt, without affectation: this was Raffaele's model for the intricate groups in his "Battle of Conſtantine," and is the great prototype of all thoſe battles and huntings ſo daringly executed by the bold pencil of Rubens. That Da Vinci at the age of fifty ſhould have ſo far ſurpaſſed the efforts of preceding painters is, however, leſs a matter of ſurprize, than, that the youthful Buonaroti, who entered the liſts with him, ſhould, as agreed by contemporary writers, have borne away the palm.

The ſubject choſen by Michelangelo for his cartoon, related to the war between the Florentines and Piſans: the moment taken was an imaginary one, when ſome of the Florentine ſoldiers, who had been bathing in the Arno, are haſtening out of the river upon the ſignal of attack, buckling on their armour, and ruſhing to the aſſiſtance of their countrymen, who had already commenced the combat in the diſtance. This ſubject naturally embraced a very great variety of character, action, and expreſſion, and was certainly moſt happily calculated for diſplaying academic acquirements, and eſpecially that knowledge of the human figure which Michelangelo is univerſally allowed to have poſſeſſed in a greater degree than any other artiſt of modern times, and which, amongſt the Florentine painters, was conſidered as at leaſt paramount to all the other parts of the art put together. It is perhaps to this laſt circumſtance that we muſt attribute the very decided pre-eminence given to the "Cartoon of Piſa" (as it was called) over that of Lionardo, and which ſoon after occaſioned his quitting his native city in diſguſt.

Conſidering theſe two celebrated works in every other reſpect, it would be a difficult taſk to determine to which belonged the preference. The figures in Da Vinci's group, it is true, were ſomewhat diſguiſed by the introduction of capricious ornaments on their armour; but, on the other hand, the Cartoon of Buonaroti wanted that breadth of chiaro-ſcuro which that of his rival poſſeſſed. Each, however, in its way, is a maſterpiece for invention, compoſition, deſign, and expreſſion; and each, in its kind, perhaps ſtill remains unrivalled. We refer the reader to a very animated deſcription of the "Cartoon of Piſa" in the third Lecture delivered by Mr. Fuſeli to the ſtudents of the Royal Academy.

The ſubjects which Lionardo and Michelangelo had ſelected for the diſplay of their talents, afforded in their nature the moſt ample ſcope for the intricacies of grouping, and the novel charms of contraſt: but it was not ſufficiently underſtood by many of the young artiſts, who flocked to ſtudy theſe works, that that which they ſo much admired, and which in reality powerfully contributed to expreſſion in the Cartoons before them, might be inadmiſſible, or at beſt ſhould be ſparingly uſed, in ſubjects of a different character. This cenſure applies not to Fra. Bartolommeo, Andrea del Sarto, and two or three others, rather cotemporaries than followers of Michelangelo; but it is certain, that the indiſcriminate introduction of contraſts, fore-ſhortenings, and naked figures, without regard to propriety or expreſſion, ſoon became a predominant characteriſtic of the Florentine ſchool.

In the ſubſequent productions of Michelangelo's pencil, we almoſt ever find the happieſt concordance of ſtyle with ſubject, nor can he be accuſed of having at any time ſacrificed the invention or expreſſion of his picture, to an oſtentatious diſplay of his powers in the executive parts of the art.

The general deſign of his ſublime works, the "Vault of the Seſtine Chapel," and the "Laſt Judgment," will be the ſubject of our conſideration, when we come to treat of invention and expreſſion in painting; we ſhall, for the preſent, content ourſelves with obſerving, that there is no part of them which affords not a valuable leſſon in compoſition. The beautiful angels, attendant on the Creator of the ſun and moon, give dignity to the ſubject at the ſame time that they enrich the compoſition. The angelic troop, ſupporting the figure of the Almighty, in the Creation of Man, by furniſhing a number of ſmall parts oppoſed to one large one, produces a delightful effect; whilſt the broad dark mantle which ſurrounds the whole, at once ſimplifies, whilſt it throws out the group; this rich group is again finely contraſted by the ſimple unembelliſhed figure of Adam. In the compartment where Adam and Eve are repreſented eating the forbidden fruit, Michelangelo has laid himſelf open to the accuſation of having been guilty of an anachroniſm, as he has introduced in the ſame picture their ſubſequent expulſion from Paradiſe; but, ere we condemn his conduct, it will be well to conſider whether the fault, if it is one, in the caſe before us, is not amply made amends for by the additional intereſt and the awful leſſon it furniſhes—here is at once the cauſe, and the effect; the tranſgreſſion and the puniſhment. This group of the "Tranſgreſſion of Man" is particularly deſerving our notice, as it furniſhes an example in compoſition different from any other in the chapel; the Eve is ſitting in a beautiful poſture on the ground, and nearly in front; ſhe extends her left arm to receive the apple preſented to her by the tempter, who is repreſented, like the Scylla of the ancients, under the form of a female terminating in a ſerpent: Adam is ſtanding immediately behind the figure of Eve; he extends both his arms to pluck the fruit off the tree, and thus diſcovers a back view of his figure from the loins upwards, thereby making a moſt beautiful contraſt to the Eve, at the ſame time that it aſſiſts, by its union or connection with the ſerpent and the tree, in forming a ſort of arch over the figure of Eve, which produces a moſt agreeable and novel effect. In that tremendous group of the "Offending Iſraelites tormented by Serpents," the low point of ſight increaſes the terror of the ſcene, at the ſame time that, by cauſing the figures to be fore-ſhortened, it permits the introduction of a greater number of them, and of a larger ſize than could have been the caſe, had the horizontal line been ſuppoſed higher. The "Prophets" and "Sybils" might each in their turn furniſh a lecture; but it would far exceed our limits to attempt to point out the various maſter pieces of compoſition with which the Seſtine Chapel abounds. Each compartment or group contains ſome principle or eſſence more or leſs diſtinguiſhing it from every other, and peculiarly adapted to the expreſſion of the ſubject it repreſents.

The "Laſt Judgment" was executed many years after the Vault of the Seſtine Chapel. With reſpect to the compoſition of this celebrated work, as a whole, there have been various opinions; ſome highly approving the uniform arrangement of the groups into diſtinct ſubdiviſions, as contributing to that awful majeſty required by the ſubject; whilſt others have regretted the abſence of that perſpective, that depth, that *ſfondo*, employed with ſo ſtriking and pictureſque an effect in the great works of Tintoretto, Paolo Veroneſe, and Rubens. The matchleſs perfection of the diſtinct groups has however remained undiſputed, and we can therefore with ſafety recommend the prints from them by Georgio Mantuanus, or thoſe recently publiſhed by Mr. Metz, as ſources from which the ſtudent will beſt acquire the principles of grand compoſition, at the ſame time that he imbibes the antidote to poverty of ſtyle, and to every thing trivial or common-place.

We have before obſerved that the older painters conſidered a certain degree of uniformity of diſpoſition as indiſpenſable in thoſe repreſentations, which were more eſpecially intended as objects of devotion or religious awe. Michelangelo, though in moſt other reſpects he departed from the ſyſtem of his predeceſſors, ſeems to have conſidered this principle as ſacred; accordingly, in his deſigns of Madonnas, Holy Families, and Pietas, we ever find this uniformity; ſometimes effected by the manner of placing the figures, and balancing equally, as it were, one ſide of the compoſition with the other; ſometimes by the regularity of the architectural decoration. His "Chriſt with the Samaritan Woman at the Well" is an inſtance of this kind, ſo is the "Flagellation at S. Pietro Montorio," and, more particularly ſo, his "Repreſentation of the Crucifixion," where the two angels in the clouds and the two figures of the Madonna and St. John, are introduced abſolutely at meaſured diſtances on each ſide of the croſs.

Fra. Bartolommeo di San Marco has practiſed a ſimilar uniformity of compoſition in his great altar pictures, and ſo has not unfrequently Raffaele, although in many of his numerous ſmall pictures of the Holy Family he ſeems to have aimed at the expreſſion of domeſtic felicity or maternal endearment, rather than to elevate the mind to the contemplation of the myſteries of redemption by a ſublime image of the Virgin Mother with the Infant God.

If the works of Michelangelo excel in ſublime imagery, or in the perſonification of ſupernatural agency, thoſe of Raffaele, on the other hand, have ever been conſidered the moſt perfect models of that ſpecies of painting which is properly termed hiſtorical or dramatic. "We ſtand with awe" ſays Mr. Fuſeli, "before M. Angelo, and tremble at the height to which he elevates us. We embrace Raffaele, and follow him wherever he leads us." The works of Raffaele never fail to exhibit the happy union of a compoſition every way adapted to the expreſſion of the ſubject, joined to an inexhauſtible variety of well-arranged and beautifully contraſted groups; and yet every part ſeems ſo naturally to grow out of the ſtory, and comes ſo home to our feelings, that the ſpectator is often almoſt tempted to exclaim, with the countryman when he ſaw Garrick, "Why I ſhould have done it ſo myſelf!"

The productions of Raffaele furniſh nothing like a recipe for compoſition. He well knew there was none, and hence thoſe forcible and diſtinct impreſſions which each of his pictures makes on the mind, and leaves indelible on the memory.

If Raffaele can be ſaid to have regulated his compoſitions by any particular rule or maxim, it was that of making each as unlike the other as poſſible, conſiſtent with propriety of expreſſion. Thus, in the Cartoon of "Chriſt giving the keys to Peter," the apoſtles, all crowding together to be witneſſes of the action, occupy the principal part of the picture, and form a group as it were in profile, the Saviour, although in the corner of the picture, being nevertheleſs rendered evidently the principal figure, by the inſulated ſituation given to him, as well as by the actions of the apoſtles, who all preſs forwards towards him, as to the centre of attraction. This Cartoon is finely contraſted by that repreſenting the death of Ananias, where the figures of the apoſtles form a group in the centre, and are all ſeen in front. The admirable deſcription of this compoſition by Mr. Fuſeli cannot but prove acceptable to the reader. "In the Cartoon of "Ananias," at the firſt glance, and even before we are made acquainted with the particulars of the ſubject, we become partakers of the ſcene. The diſpoſition is amphitheatric, the ſcenery is a ſpacious hall, the heart of the action is the centre, the wings aſſiſt, elucidate, connect it with the ends. The apoplectic figure before us is evidently the victim of a ſupernatural power inſpiring the apoſtolic figure, who, on the raiſed platform, with threatening arm pronounced, and with the word enforced his doom. The terror occaſioned by the ſudden ſtroke, is beſt expreſſed by the features of youth and middle age on each ſide of the ſufferer; it is inſtantaneous, becauſe its ſhock has not yet ſpread beyond them, and this is done not to interrupt the dignity due to the ſacred ſcene, and to ſtamp the character of devout attention of the aſſembly; what preceded and what followed is equally implied in their occupation, and the figure of a matron, entering, and abſorbed in counting money, whilſt ſhe approaches the fatal centre, and whom we may ſuppoſe to be Sapphira, the accomplice and the wife of Ananias, and the devoted partner of his fate. In this compoſition of near thirty figures, none can be pointed out as a figure of common place or mere convenience; they are linked to each other, and to the centre, by one chain; all act, and all have room to act, repoſe alternates with energy." The Cartoon of "Peter and John healing the Cripple at the Beautiful Gate of the Temple," is again ſtrikingly different from either of the others, Raffaele having there, with a boldneſs of which any but a ſublime genius would have been incapable, interſected his compoſition by the columns of the portico. But though divided, it is true, into ſeparate, and almoſt equal parts, neither the unity of action, nor the expreſſion of the picture, is impaired, whilſt the effect produced is at once novel and beautiful. In the Cartoon of "Paul preaching at Athens," the elevated ſituation, and energetic action of the apoſtle, inſtantly denote him the hero of the piece, whilſt the attentive but aſtoniſhed circle gathered round him, receive, as it were, light from him, their centre, and unequivocally declare him the reſiſtleſs organ of divine truth.

The Series of "Scripture Hiſtories," painted by Raffaele in the Loggia of the Vatican, and his other works, do not leſs evince the deſire of obtaining, as far as conſiſtent with propriety of expreſſion, this diverſity in his compoſitions; but an attentive examination of the prints from them, will better elucidate this point, and indeed every thing relative to compoſition, than a volume of prolix and laboured deſcription. In ſhort, the works of Raffaele diſplay the moſt becoming union of natural with acquired talent; ſtrength of conception, and inexhauſtible invention, with propriety of diſpoſition in the whole, and endleſs variety in the component parts.

After the death of this great maſter in 1520, the art rapidly declined, nor has any one ſince him trod with equal ſucceſs the dignified and inſtructive path of hiſtory-painting.

The great reputation of Raffaele, however, even for ſome time after his death, checked the aſcendency of miſtaken principles, at leaſt in Rome, where the great works in the Hall of Conſtantine, and other rooms of the Vatican, were ſtill continued by Giulio Romano and Raffaele's other ſcholars, after their maſter's deſigns.

Of Polidoro da Caravaggio, one of the moſt eminent, it might be ſaid that the ſoul of a Greek animated his pencil, ſo replete with Attic purity and grandeur of ſtyle are his numerous friezes on the facades of the palaces of Rome, now however beſt known by their prints by Goltzius, Cherubino, Alberti, and Bartoli.

It was not till after the noted ſackage of Rome in 1527, when the arts and artiſts were forced to ſeek an aſylum in diſtant parts of Italy, that painting was doomed to ſuffer degradation; Polidoro flew to Meſſina, Pierino del Vaga to Genoa, and Giulio Romano to Mantua, where, in the palace of the T, he explored the regions of poeſy, gave new force to the inſtructive leſſons of fable, or decked the playful charms of allegoric fiction; ſtill however firm to the principles of his great inſtructor, nor ever ſacrificing the true end of his art, the expreſſion of the ſubject, to a too oſtentatious diſplay of his prowess in the means.

We have before obſerved that Michelangelo's celebrated Cartoon of "Piſa," contributed not a little by its influence to determine the future character of the Florentine ſchool. Blind to its more ſublime excellencies, the vigour of its conception, the energy and variety of its parts, and its unity of action as a whole, the young ſtudents of Florence ignorantly imagined that a ſimilar introduction of naked and foreſhortened figures into their compoſitions, without any reference to the ſubject of their picture, would at all times inſure them the applauſe of the artiſts of their own country, and the envy of thoſe of neighbouring ſtates: nor had Michelangelo the good nature or the good ſenſe to point out their error.

An army of expert manneriſts, for the moſt part joining to a miſerable ſterility of conception the moſt audacious rapidity of execution, but proud of poſſeſſing what they thought the true ſecret of the *Grand Guſto*, now ſallied forth; nor can it be a matter of ſurprize that the palaces, the churches, and the halls of Rome, Florence, and moſt of the other cities of lower Italy, were ſo ſoon deluged with the common-place productions of mediocrity, ſince the unrelenting pencils of Giorgio Vaſari and Federigo Zuccaro alone, covered more ſquare yards of wall or canvaſs than had been effected by the honeſt diligence of perhaps any ten of their predeceſſors.

The due expreſſion of the ſubject of a picture was now the laſt conſideration. Provided two or three well drawn academy-figures, however unmeaning, occupied the foreground on the one ſide, and ſome women ſporting with their children, on the other, whilſt the centre diſplayed a pyramidical group, all was well; the employer was delighted, and the painter applauded. Thus a ſtranger may paſs and repaſs through the Sala Regia in the Vatican without being ſtruck by, or diſcovering the meaning of one of thoſe freſcoes which occupy its ſpacious walls, or without being afterwards enabled to call to mind the ſmalleſt feature diſtinguiſhing one from the other. This ſubverſion of art, this ſilly fondneſs for what was erroneouſly conſidered pictureſque compoſition, for near a century afterwards degraded the ſchools of Rome and Florence; we ſhall therefore leave them, and turn the reader's attention to thoſe of Lombardy and Venice.

If the anatomic ſtudies of the old Florentine artiſts had rendered them almoſt excluſively the maſters of correct deſign, the painters of Lombardy could boaſt a more complete inſight into the doctrine of perſpective, and were certainly the firſt who applied it with real effect in large works.

Melozzo da Forli, in the middle of the fifteenth century, in his freſco in the vault in the tribuna of the church of St. Apoſtoli at Rome, firſt diſcovered what the Italians call the knowledge of the *Sotto in Sù*, that is, the method of foreſhortening figures, ſo as to give them the due appearance of rotundity and projection when ſeen from below; and upon the ſame principle, Andrea Mantegna, in ſeveral of his great works, and particularly in a chapel at Padua, where the ſtoried compartments are entirely above the eye, adopted, with equal boldneſs and effect, an ideal point of ſight upon a line with the eye of the ſpectator, that is beneath the very bottom of the picture.

From ſources like theſe, Antonio Allegri da Coreggio, the ſplendid meteor of the Lombard ſchool, imbibed the firſt principles of his art. With a ſpirit every way conformable to his name, he pictured the "Joyful Aſſumption of the Madonna amidſt Myriads of the Angelic Hoſt," in the cupola of the duomo of Parma, and the "Aſcenſion of Chriſt," in the church of S. Giovanni in the ſame city; works which may be juſtly ſtyled the never-equalled models for that ſpecies of compoſition. In the execution of theſe, and probably of his other chief works, he was however greatly aſſiſted by his friend Antonio Begarelli, a celebrated Modeneſe ſculptor, who modelled for him in clay all the figures, ſo that Coreggio, by placing and grouping them together as they were to be repreſented, was enabled to delineate, with the greateſt correctneſs, every foreſhortening, and at the ſame time to acquire a truth and boldneſs of light and ſhade unattainable by any other means. And here it may be well to obſerve, that the trouble of preparing ſuch models in the firſt inſtance, is amply repaid by the great facility, or rather certainty, which it gives the artiſt in the execution of his work. Moreover, the painter having his modelled figures before him, and being enabled, by varying the ſituation of his eye, to view them in every direction, will frequently diſcover beautiful combinations which he never dreamed of, at the ſame time that he is rendered leſs liable to the error of too often repeating the ſame view of a figure, or the ſame action, and is taught to avoid a common-place mode of compoſition.

Primaticcio, a native of Bologna, in his commerce with Giulio Romano, whom he aſſiſted in his works at Mantua, acquired an admirable talent for treating poetical ſubjects. Maſter of perſpective, and the *Sotto in Sù*, his beautiful fictions on the ceilings, and other compartments, in the palace of Fontainbleau, alike charmed by the fire with which they were conceived, the elegance of their compoſition, the prodigious boldneſs and truth of their effect, and the eaſy grace with which they were executed.

The grandeur and ſtriking appearance of projection and depth, for which the works of Primaticcio were ſo remarkable, judging as well by their prints as by the writings of thoſe who witneſſed them prior to their deſtruction, was in a great meaſure occaſioned by his having univerſally choſen, what is called in perſpective a *ſhort point of diſtance;* by which mode of conduct the figures in his near-ground appeared proportionally large, as thoſe behind diminiſhed in a more rapid gradation. This mode of conduct in Primaticcio is the more worthy of remark, as it is the reverſe of what we generally find adopted in the works of the great Roman and Florentine painters, his predeceſſors. It became, however, a favourite doctrine of the Venetian ſchool, particularly of Tintoretto and Paulo Veroneſe, and was one of the leading principles of the Caracci in the formation of their ſtyle.

The compoſition of Giorgione, Titian, and the older Venetian painters, is ſimple and dignified, ſuggeſted by the ſubject alone, and of courſe liable to none of thoſe objections which apply to the works of their followers, Tintoretto, Paulo Veroneſe, Palma, and a multitude of others, who, like the Florentines, valuing themſelves chiefly upon the poſſeſſion of only a part of the art, ſacrificed to their favourite darling all the remainder. No longer expreſſion, but colouring and glitter of effect became their object, and hence, with all their prodigious talents, they ſoon turned the art into a ſplendid toy.

The works of theſe great maſters (for great they were in ſpite of all their faults) may nevertheleſs be ſtudied with benefit, even as to compoſition, as they at all times poſſeſs a boldneſs and variety of diſpoſition, which rank them far above the inſipid and mannered performances of their cotemporaries of Florence and Rome.

About the end of the 16th century, the Caracci of Bologna attempted, by an union of the ſcattered excellencies of the various ſchools beforementioned, to eſtabliſh a perfect ſyſtem of art: but though they indeed ſo far ſucceeded as to form a ſtyle in which no particular fault ſeemed to predominate, ſtill in no one point did they fully reach the purpoſed objects of their emulation. Their works preſent neither the dignified compoſition, the juſt and ſtriking expreſſion, the beautiful variety of character, which diſtinguiſhes thoſe of Raffaele; the ſublime conception, or the learned and grand deſign of Buonaroti; the grace and enchanting effect of Coreggio, nor the truth and richneſs of Venetian colour; but ſeem rather the reſult of a ſyſtem founded on the baſis of a compromiſe between the eye and the underſtanding, the mechanic and the ideal of the art; in forming which compact, however, the former have been evidently allowed the preponderance. This remark is, perhaps, leſs applicable to the productions of Ludovico Caracci; but with reſpect to the chief works of Annibale, and particularly his Farneſe gallery, we cannot withold our aſſent to the critiques of Mr. Fuſeli, and the ſevere but juſt remarks of Mr. Webbe.

Having ſaid thus much, it cannot be expected that we ſhould hold forth the Caracci as models for imitation; there is nevertheleſs a breadth, a concordance of the various mechanical parts of the art, and an eaſe in their ſtyle which render it highly deſerving our regard, and would have juſtly entitled the Caracci to a reputation even greater than that which they have ſo long enjoyed, had their prodigious powers been made the vehicle of more elevated conception.

With reſpect to the ſcholars of the Caracci, and other artiſts of reputation, who immediately ſucceeded this epoch, it is only to our preſent purpoſe to obſerve, that grace and beauty rather than grandeur or ſublimity, ſeem to have been their objects, and that whatever eminence they ſometimes attained in their Holy Families and devotional ſubjects, ſtill the dignity of hiſtorical painting was evidently on the decline.

Niccolo Pouſſin alone ſeems to have conſidered the art as a language addreſſed to the mind through the organs of viſion. Poſſeſſed of a refined and ſcrutinizing mind, he at all times collected, and, with the greateſt ingenuity, inſerted in his pictures all thoſe collateral circumſtances, probable or poſſible, which his ſubject could furniſh; and hence his works, more addreſſed to the imagination than the eye, at once invite and are ſure to reward inveſtigation. The greateſt defect, however, of his compoſitions, ſeems to be that theſe explanatory or acceſſorial groups generally appear too principal, and thereby not unfrequently counteract their object, by diſtracting the attention from the principal figure or group, deſtroying the unity of action, and weakening that expreſſion which they were intended to augment. Were we to draw a compariſon between Pouſſin and Raffaele, we ſhould liken the former to the cool but ſubtle reaſoner, who by ſlow degrees brings us to grant his poſition; Raffaele to the heaven-taught genius who at once darts the ray of truth upon our minds.

The works of Pouſſin, though eſteemed even in his lifetime, had little influence in correcting the corrupt and meretricious taſte which was every day gaining ground in Italy. The proper end of the art had been long forgotten or habitually ſacrificed, and that bane of painting, pictureſque, or artificial compoſition, which, however varying in its mode, was ever the ſame in its effect, became every day more deeply rooted.

Poverty of conception, or rather no conception at all, common-place or unmeaning attitude, contraſt ſo often repeated as entirely to loſe its effect, and, above all, empty buſtle, were now become the elements of what was ſtill called hiſtorical compoſition: if to this we add a brilliant rapidity of execution, joined to gay colouring and tolerable light and ſhade, with occaſionally a madonna's or an angel's head, rather pretty and ſeductive than devout, we have the ſum total of the merits of the moſt eminent artiſts who ſucceeded this period, and the genuine characteriſtics of the admired Pietro da Cortona, the facile Luca Giordano, and the inſipid Carlo Maratti.

It would ſwell this article beyond our preſcribed limits, without throwing much additional light on our ſubject, were we to attempt to trace the different changes of ſtyle which at various periods took place in the ſchools of painting of Germany, Flanders, Holland, or France. The ſucceſſion of young ſtudents, who at all times conſidered a viſit to Italy as an indiſpenſable part of their education; naturally imbibed in a greater or leſs degree the principles of thoſe to whom they had been taught to look up as models for their imitation: hence the ſtyle of the Florentine and Roman manneriſts of the 16th century, unjuſtly denominated the followers of Michelangelo, was caricatured in the prepoſterous works of Martin Heemſkerck, Van Mander, Spranger, and Goltzius; that of Tintoretto feebly imitated in thoſe of his ſcholars, de Vos and Rotthenhamer. Rubens, however, who, though long in Italy, became no wiſe infected by that poverty of ſtyle which then prevailed, broke the fetters of corrupt ſyſtem, and reſcued his countrymen from the effects of ſuch baneful influence. His comprehenſive genius, cultured by reading, enlightened by travel, and bleſt, above all, with that envied quality, a juſt appreciation of its own powers, could not but obtain its object, that object being once clearly defined and ſteadily purſued. What that object was, the decided character of his works ſufficiently determines: it was unqueſtionably the union of magnificent and expreſſive compoſition, with the moſt ſplendid colouring and the greateſt breadth of chiaro-ſcuro; for, however enchanted by the ſpells of colour, Rubens never forgot that painting is mute poeſy, and its firſt great prerogative, the converſe, which, through the medium of the eyes, it is permitted to hold with the underſtanding. It cannot, therefore, be ſaid of Rubens, as of the Venetian painters we have cenſured, that he ſacrificed the ideal to the mechanical part of his art. With the exception of his ſmaller works, or ſuch as he was ſometimes neceſſitated to undertake, in compliance with the will of his employers, we generally find in his productions the moſt judicious application, the moſt happy combination of his powers:—Subjects allowing full ſcope to the exuberance of his invention, compoſitions furniſhing an ample field for the magic blaze of his tints, and the broad expanſe of his maſſes.

It was the good fortune of Rubens that the burines of the moſt eminent engravers were employed under his own inſpection, to make prints from all his chief works; and indeed ſo admirably is the character of the originals preſerved in thoſe of Bolſwort, Voſterman, Pontius, and others, that when the pictures ſhall be no more, they alone will be ſufficient to eternize the claims of this great maſter of the Flemiſh ſchool. As an inventor and compoſer, the "Battle of the Amazons," the numerous "Huntings of Wild Beaſts," the "Raiſing of the Croſs," the "Michael combating the Devil and his Angels," and the two tremenduous repreſentations of the "Fall of the Wicked," are alone ſufficient to place Rubens in the firſt rank; to ſay nothing of his celebrated "Garden of Love," and the truly poetic allegories in the "Luxemburgh gallery."

Of Rembrant, the great head of the Dutch ſchool, it has been juſtly remarked by Mr. Fuſeli, that he was "a genius of the firſt claſs, in whatever relates not to form." We have in another place ſpoken of his chiaro-ſcuro, (ſee Clair *Obſcure*,) and we can, with equal propriety, upon the preſent occaſion, recommend the ſtudy of his works to all thoſe who feel with us, that the telling of the ſtory, and the appropriate expreſſion of the ſubject are the true ends of compoſition; nor will we omit to add, that the works of many of the other Dutch painters, particularly Oſtade and Brawer, however the humble repreſentations of low and vulgar nature be their object, abound in admirable examples of compoſition, and may be ſtudied with advantage, even by ſuch as make the more noble path of hiſtorical or epic painting the courſe of their purſuit.

In the retroſpect we have taken of the ſtyles of compoſition at different periods, adopted by the ſchools of Italy, it has been our care to point out to the ſtudent ſuch examples as are beſt calculated by their influence to promote his advancement towards the legitimate end of our art; at the ſame time, that we have cautioned him againſt that corrupt but ſpecious ſyſtem of grouping, which, for diſtinction's ſake, we have called pictureſque.

The art of painting is a language addreſſed, through the medium of the eyes, to the underſtanding; like that addreſſed to our minds through the ears, it muſt have ſome ideas, ſome truths to communicate; and the perfection of painting, as well as of writing, conſiſts in conveying thoſe truths to the mind in the moſt clear, the moſt forcible, and moſt beautiful manner. A judicious diſtribution of the arguments in a diſcourſe is of importance, inaſmuch as it gives additional force, and ſheds increaſed luſtre on the evidence contained; but in a picture this propriety of diſtribution is itſelf the argument and the evidence, and is therefore indiſpenſable.

Thoſe who are converſant with the firſt ſketches and drawings of great maſters, know that a few ſimple rude lines are frequently found ſufficient to impreſs the mind with a deciſive and immediate idea of the ſtory meant to be repreſented, and that, in many caſes, even the expreſſions as well as the actions of the chief figures ſeem evident, although no features of the countenances be delineated.

We may, therefore, ſafely affirm, that any rule, any mode of compoſition, except ſuch as is dictated by the ſubject of a picture, is wrong, and that, were this doctrine ſufficiently underſtood, we ſhould not ſo frequently paſs unmoved by graphic repreſentations, or remain ignorant of the ſubjects they were intended to expreſs.

To attempt, therefore, to preſcribe any general method of diſtribution would be to inſult the underſtanding of our readers and to degrade the art. The painter, warmed by his ſubject, muſt form the ideal picture in his imagination, and from thence transfer it to the canvaſs: it is only as to the relative economy of the parts of the work that ſome hints may be ſuggeſted: theſe are the reſult of obſervation and experience, and bear the ſtricteſt analogy to the precepts we have inculcated reſpecting clair-obſcure and colouring, and, perhaps, to every other part of the art.

As there ſhould be in a picture one principal maſs of light, which, however connected with others, ſhould ſtill predominate; ſo one group or one figure ſhould ſtrike the eye with the ſame ſuperiority over the ſecondary groups or figures of the compoſition; as in clair-obſcure there is no rule by which we are obliged to place the principal light in any one given part of the picture; ſo are we at liberty to give to the chief group or figure of the compoſition that ſituation which we judge moſt appropriate. As in clair-obſcure, an inequality of parts, a ſubordination of ſeveral ſmall maſſes to one large one, never fails to produce richneſs and beauty of effect; ſo in compoſition a ſimilar richneſs and beauty are the reſult of an oppoſition of ſeveral ſmall bodies or parts, to one large and ſimple; as we have before illuſtrated by the ſublime group of the Almighty, ſupported by a multitude of angels, in the "Creation of Adam," by Michelangelo.

As by the addition of ſmaller maſſes of light, connected with the principal maſs, that maſs acquires at once greater breadth and influence; ſo the unity of action in a compoſition is in moſt caſes powerfully augmented by a repetition of nearly the ſame action in two or three of the acceſſorial figures arranged together, one nevertheleſs being principal: this was the frequent cuſtom of Raffaele, has its foundation in nature, where ſimilar ſentiments moſt frequently excite ſimilar outward demonſtrations, and never fails, if judiciouſly managed, to produce its effect.

Every thing that has been ſaid relative to contraſt of clair-obſcure, or relieving dark or light maſſes immediately by their oppoſites, equally applies to compoſition, where ſtrong contraſts of line, of back to front figures, &c. produce ſimilarly ſtriking and beautiful effects, and muſt to inſure thoſe effects be uſed with ſimilar diſcretion and parſimony. The too frequent introduction of contraſts of lights and ſhadows or of colours, produces a ſpotty and confuſed effect; the inordinate uſe of contraſts in compoſition produces ſimilar confuſion, and defeats their end. The moderate introduction of them in both caſes gives a zeſt to the picture. It is like the border or other well-diſpoſed ornament on a piece of drapery; but when indiſcriminately uſed, the work reſembles the rich gothic medley of an embroidered petticoat, where the beautiful folds of the ſtuff are wholly obſcured by tinſel and gewgaw.

Having obſerved thus much, we muſt refer the reader, who is deſirous of obtaining a more complete inſight into the ſubject of this inquiry, to the works of the great maſters above-mentioned, or to the numerous prints which have been made from them, by the moſt eminent engravers of the laſt three centuries. One hour ſpent in the ſtudy of the Cartoons of Raffaele, or the Laſt Judgment of Michelangelo, will perhaps teach more than could be inculcated by words in the compaſs of this volume.

What we have ſaid of hiſtorical compoſition may equally apply to landſcape; each work ſhould poſſeſs a decided character, diſtinguiſhing it from its neighbour, and calculated to incite a train of kindred reflections. This we ſometimes find in the ſimple views of the Flemiſh and Dutch painters, who painted nature as they found her, and did not think it neceſſary that every picture ſhould poſſeſs a given proportion of fore ground, middle ground, diſtance and extreme diſtance, a winding road, a meandering ſtream, a water mill, a church ſteeple, a hanging wood, and a mountain.

The works of the two Pouſſins, ſome of thoſe of Salvator Roſa, Dominichino, and the Caracci, and the admirable etchings from the drawings of Titian, abound in the fineſt examples of ſublime and characteriſtic landſcape, and are indeed ſo perfect in their way, that they can never be ſufficiently contemplated by the artiſt who would attain eminence in this delightful branch of art.

Plates illuſtrative of compoſition.

No. 1. "The Battle of the Standard," by Lionardo da Vinci.

2. "The Cartoon of Piſa" (or according to Vaſari, its chief group) by Michelangelo Buonaroti.

3. "The Creation of Man," the "Tranſgreſſion at the Tree of Knowledge," and "The Expulſion from Paradiſe;" freſcoes of Michelangelo in the Seſtine chapel.

4. "Groups of the Laſt Judgment," by the ſame author in the ſame chapel.

5. "Paul preaching at Athens" from the Cartoon, by Raffaele, at Hampton Court.

6. "The Group of the Aſſumption of the Madonna," in the cupola of the Duomo at Parma. Coreggio.

COMPOSITION, in *Pharmacy*, the art, or act, of mixing divers ingredients together into a medicine; ſo that they may aſſiſt each other's virtues, ſupply each other's defects, or correct any ill qualities thereof.

COMPOSITION, in *Printing*, ordinarily called *compoſing*, is the arranging of ſeveral types or letters in the compoſing-ſtick, in order to form a line; and of ſeveral lines ranged in order in the galley, to make a page; and of ſeveral of thoſe to make a form.

The compoſing-ſtick is made of iron generally, ſometimes braſs or wood; of greater or leſs length or depth, according to the page to be compoſed, or the compoſitor's fancy: it hath two ſliding pieces, to be faſtened by means of a nut and ſcrew, which are ſlipped forwards or backwards, at the pleaſure of the compoſitor, and according to the ſpace which the lines, notes, &c. are to take up. See *Plate Miſcellany, Fig.* 5.

The compoſing-ſtick ordinarily contains ſeven or eight lines of a middle-ſized letter; theſe, when ſet, are taken out, by help of a thin ſlip of braſs, termed a rule, and diſpoſed in the galley; and others compoſed, till a page be formed. The page being compoſed, is tied up, and ſet by; and the reſt of the pages of the ſheet prepared in the ſame manner: when done, they are carried to the impoſing or correcting-ſtone; there ranged in order, and diſpoſed in a chaſe, or iron-frame, fitted with wooden furniture; then, the quoins being ſtruck in, it is carried to the preſs to be printed.

Composition, in *Sculpture*, from *Compozitione*, Italian, the art of placing figures or other objects together, whether by entwining them in groups, or forming them into maſſes more nearly or diſtantly appoſed. The word bears the ſame meaning in the arts of deſign as in literature, from which it was moſt probably received, with many other terms, by the Italian artiſts at the revival of learning. Although in its moſt ſimple ſenſe it is only ſyntheſis, or joining together; yet, in its extended acceptation, it comprehends the production, order, and fitneſs of all the parts contained in the whole. The firſt elements, therefore, are invention and ſentiment; the invention ſhould be new and copious, affording an abundant choice of beautiful parts according to the ſubject, whether there be many figures or one only; the ſentiment muſt be juſt and ſtriking; according to the rule "feel yourſelf if you would make others feel;" this muſt pervade every part of the character of the figures; their action or paſſion expreſſed to the points of their fingers and toes as well as in the very folds of their drapery.

The order of compoſition contains the divine, heroic, and hiſtoric. The divine contains all ſublime and terrific ſubjects of divinities, angels, departed ſouls, and infernal miniſters. The heroic, according to the ancients, conſiſts of thoſe mortals, ſaid to have one mortal and one immortal parent. The hiſtoric claſs contains the whole ſeries of human life, in which however the moſt exalted perſons and circumſtances are always to be preferred.

The arrangement muſt be dramatic, repreſenting an action; becauſe ſentiment only affects the countenance of the figure prior to action, and words cannot be expreſſed by mute figures; therefore the ſentiments and paſſions muſt be demonſtrated by the action, in which the figures partake. The principal perſon muſt have the moſt diſtinguiſhed place, whilſt the inferiors occupy ſubordinate gradations; thus in "Prometheus chained;" Prometheus occupies the firſt intereſt and place, whilſt Force, Strength, and Vulcan are gradually inferior, although linked in the ſame group. If the hero or heroine of the ſubject be not entwined in the ſame group with other figures, he or ſhe will ſtill be diſtinguiſhed by a preferable ſituation to thoſe in which the inferior perſons are placed; this rule is obſerved in all the beſt pictures of the Herculaneum collection. In the antique baſſo-relievos and painted vaſes, and in the beſt works of antiquity, we ſcarcely ever ſee more figures introduced than ſuch as are ſufficient to tell the ſtory, and for this reaſon that the expreſſion may be the ſtronger, being leſs divided.

Outline. The general outlines of a compoſition, whether it conſiſt of one or more groups, ſhould be agreeable to the eye, which is produced by a ſucceſſion of curves of different ſegments alternately reverſed; or, in other words, a ſucceſſion of S. lines of different curvatures and dimenſions. Theſe will be more gentle in tender and graceful ſubjects, ſuch as the Triumphs of Nymphs, Naiads, and Sea Divinities, the Judgment of Paris, &c. In the antique baſſo-relievos, theſe curves become more violent with a mixture of angles in ſubjects of great exertion, ſuch as the War of the Giants, the Battles of the Lapithæ and Centaurs, the Athenians and Perſians. See Stuart's Athens, vol. iii. Muſeum Pium Clementinum. Baſſo-relievos. In the fine antique groups, as the Laocoon, Niobe and her Daughter, Cupid and Pſyche, and the Fauns and Nymphs, the lines are incatenated (chained) as it were linked into each other in whatever view they are ſeen.

Light and Shadow. Sculpture is not like painting, ſeen and forced on our perception, by the variety and brilliance of its colours. On the contrary, it has properly no colour at all; and its forms are underſtood by the effect of light and its privation, with the degrees of their medium called middle tint; theſe, in fact, produce the all of ſculptural forms to the eye, becauſe no ſuch thing as outline really exiſts, and when we ſpeak of it or uſe it, it is only to demonſtrate form geometrically. Light and ſhadow will be continually varied in the varied forms of the human figure. If ſeen abroad in the open air, or illumined from a ſky-light within doors, the light will ſtrike moſt powerfully on the head and breaſt, and gradually with leſs force on the lower part of the body and inferior limbs as they approach nearer to the earth. If the figure be recumbent, or in an horizontal poſition, thoſe parts will have moſt light which are neareſt to the luminary. If the figure be inverted, the bottoms of the feet will have the ſtrongeſt lights, which will gradually diminiſh as they approach the head; and conſequently all thoſe parts which are ſhadowed, when the figure is upright, will be lightened in this poſition, and *vice verſâ.* It muſt be remembered that, as the human figure partakes of globular forms, ſome one part will be lighter than the reſt, and that light will be brighteſt in one point. It will be found that figures in ſculpture are almoſt covered with middle tint, having a ſmall portion of bright light neareſt the luminary, with a very few dark and ſtrong ſhadows which relieve particular projections. Baſſo-relievos preſent the general effect of darkiſh figures on light back-grounds; in diſtribution of quantity, of both lines and form, that will be moſt agreeable which is inherent in the nature of things, which pervades all creation, and is more particularly evident in muſical proportion of 3ds, 5ths, and 8ths, with their ſubdiviſions and relative quantities.

We muſt however obſerve, that the rules for compoſition, like all other rules laid down for liberal art, will only aſſiſt genius; they will never produce any thing without the vigorous exertion of mental powers and manual induſtry in the ſubtle inveſtigation and diligent imitation of nature; all muſt be done by ſympathy and beautiful repreſentation; rules may be compared to the ſcaffold for raiſing a building. We muſt therefore remember that the beauties of nature are alſo various as they are endleſs, and from them only we can furniſh ourſelves with original materials for compoſition, by continually obſerving the expreſſion of ſentiment and paſſion in men, women, and children; the characters of their faces, the forms and action of their limbs, their draperies, and the manner in which the direction of the folds obſcures or indicates the bodies or limbs, in the grouping of figures; the entwining of the limbs ſhould be carefully obſerved, and the planes in which the different parts of the bodies and limbs are directed.

In the liberal arts, the ſentiment of a compoſition applies to our ſympathetic feelings, as the invention ſurprizes and delights by its novelty, and both together animate the maſs as a body is animated by the ſoul; and as no compoſition would be complete or intereſting without them, ſo when theſe vital principles are obtained, great care ſhould be taken to confine their demonſtrative forms within that department of art to which they belong, in order that the whole may be as pleaſing as intereſting, without deformity or abſurdity. Thus, for example, all thoſe poſitions which extend the human figure by violent action ſhould in baſſo-relievo be repreſented in the flatteſt view, in which all the lines of the body and limbs may be underſtood in the fulleſt and cleareſt manner, without legs or arms ſtanding out horizontally from the back ground, like ſcaffold poles driven into a wall. Such extended members belong only to the claſs of entire ſculpture, as ſtatues and groups. The lines and limbs in the compoſition muſt be more parallel to the back ground, as the alto-relievo or baſſo-relievo recedes from entire ſculpture, until, in the flatteſt relief, the moſt complicated forms and groups are diſtinguiſhed by little more projection than an outline gives.

COMPOSSIBLES, Compossibilia, in *Logic,* ſuch things as are compatible, or capable of ſubſiſting together.

COMPOST, in *Agriculture,* a term ſignifying that ſort of manure which is formed by the mixture or combination of one or more different ingredients with dung or other ſimilar matter, ſo as to conſtitute an uniform maſs or ſubſtance fit for the improvement of the ſoil.

Theſe compoſts are uſually made by mixing various ſubſtances with ſtable or yard dung; and hence, in ſome counties, are called *mixens.*

The moſt common materials for this purpoſe are turf pared from waſte places, virgin earth, peat earth, lime, the ſcourings of brooks, ponds, and ditches, weeds, ſea-ſand, rubbiſh of buildings, coal-aſhes, &c. That dung alone, properly managed and applied, is a moſt valuable manure, is beyond all doubt, but it is certainly not equally uſeful in all ſoils and ſituations. It is much better calculated for active than inactive ſoils. On lime-ſtone, chalk, &c. it meets with abundance of active materials; but upon clays, deep loams, &c. it operates beſt in conjunction with lime or ſome other ſtimulating ſubſtance. When dung is intended for a compoſt, no attempts ſhould be made to add a large quantity of lime, earth, &c. till it is properly fermented, every addition of this checking the fermentation. The lime, earth, &c. ſhould be added after the fermentation is finiſhed, and the whole then carefully mixed, and laid up together. In a few days a ſecond fermentation will come on; and if the mixture has been properly turned over and properly incorporated, it will be fit for uſe in a month or ſix weeks. Some judgment and attention will be requiſite, with regard to the quantity of lime and other active principles employed; for, if the quantity be ſmall, their action upon the rich ſubſtances in the dung will be partial and imperfect; and if too great, a conſiderable loſs may be ſuſtained by their over action. If the quantity of earth alſo be ſuch as to preſs the dung too hard, the air will be excluded, and the ſecond fermentation be impeded or prevented. It is certainly a right method to lay a good coat of earth as a foundation for the dunghill, into which the moiſture of the dung may reak down; and it is no bad way to make a heap of ſuch ſubſtances as can be readily obtained, apart from the dung, and to throw the moiſture of the dunghill, and the urine of cattle over it frequently.

The compoſts employed by the farmer are formed in various ways. In ſome places where there is a head or foot ridge, too high to admit the water being readily diſcharged from the field, they plough it, then fill it full of lime, dung, or both, and, after frequent ploughings, ſpread it upon the field. After the lime by theſe means is ſufficiently mixed, the earth may be gathered into a heap with the ſpade, and mixed with dung; or the whole operation may be performed with the ſpade, which is ſtill better.

It is remarked by Mr. Young, that "the farmer may have great advantage from compoſts; which, when they conſiſt of proper materials, and are ſkilfully mixed, he may ſafely depend upon. Where a variety of materials can be had, they may, he ſays, be laid as follows: firſt clay or ſtrong earth, next ſoap-aſhes, dung, loamy earth, lime, tanners' bark, green vegetables before they run to ſeed, earth, or as many of theſe as can be got; alſo fat chalk, ſea-weeds, ſea-ſand, and ſeveral others; which may be ſo mixed, as not only to raiſe a general fermentation throughout the whole compoſt; but likewiſe to ſuit the nature of the land on which it is intended to be laid. The common way is to lay the ſeveral materials in layers, one over the other, till a large heap is raiſed; and it is adviſed by ſome authors, and the practice of many farmers is, to make theſe layers from ſix inches to a foot in thickneſs; but this he has found by experience is wrong. For the fermentation raiſed in the compoſt is not ſtrong enough to penetrate theſe thick layers, eſpecially thoſe of clay, or ſtrong earth; for after the reſt have ſufficiently fermented, and the compoſt is turned, theſe layers riſe almoſt as whole as when firſt laid, and muſt be broken by hand, to mix them with the reſt of the compoſt; whence ariſe two inconveniences, one an extraordinary expence, and the other that twice or thrice turning is ſometimes neceſſary to diſſolve theſe large pieces; and as a new fermentation is excited every time the compoſt is turned, the ſtrength of the manure is greatly waſted before it is laid upon the land, where it is then incapable of raiſing any conſiderable fermentation, which is, he thinks, one of the principal uſes of manure."

It has been ſuggeſted, that the beſt way of making compoſt is not in thick layers; but after the ground is marked out for the compoſt, to lay the ſeveral materials, after being well broken, in heaps round the ſpace marked out for the compoſt heap; and to place a man between each two heaps, to throw the manure ſpreading upon that ſpace. In this manner, the compoſt heap will ſoon be raiſed to the intended height, and the ſeveral ſorts of manure being thus well mixed, the whole will ſoon begin to ferment, and will incorporate as fully in two months, as the ſame manures, placed in layers in the uſual way, will in four or five. The owner, therefore, in making ſuch compoſts, ſhould not prepare them too long before they are laid upon the land; otherwiſe they will be much waſted, and their beſt parts evaporated and deſtroyed. And "compoſts prepared in this manner need not be turned, or at moſt not above twice. If the fermentation is obſerved to abate too ſoon, holes ſhould be made with a pole from the top almoſt to the bottom of the heap, upon which throw urine, or the returning of a dunghill, which will fill the holes, force through the whole ſubſtance of compoſt, and ſoon complete the fermentation." It is added, that "ſuch a compoſt, by duly proportioning the ingredients, may be made to ſuit any ſort of land, and is excellent for meadow or paſture grounds. A way to improve theſe, is to cut them five or ſix inches deep with the five-coultered cutting plough, or ſcarificator, which cuts the ſurface in ſlips four or five inchs aſunder, but does not raiſe or turn them. This cutting of the roots of the graſs, and the manure laid on at the ſame time, ſinking into theſe inciſions made by the coulter, cauſe an improvement in the quality of the herbage, and alſo make ſuch graſs grounds produce much more than they did before. But here it is to be noted, that cutting the ground firſt, and then laying on the manure, makes a greater improvement than manuring firſt, and then cutting; and both are ſuperior to manuring and not cutting; all which have been proved by experiments. The cutting-plough is uſed with ſucceſs upon clay grounds, loams, and gravel; but in very ſtrong grounds, the coulters are apt to be thrown out of their work by ſtones; and therefore, it is not proper to uſe the cutting-plough where ſtones abound to any great degree."

It is added, that "in ſuch compoſts, where it is intended to uſe a large proportion of earth, that lies at a conſiderable diſtance from the limeſtead, to ſave the double carriage of it to and from the compoſt heap, the dung and other materials may be carried to a head land of the field to be manured, and be there mixed into a compoſt."

It is contended that "the beſt ſituation for a compoſt, is upon level ground; or if made upon a deſcent, a trench ſhould be cut on the lower ſide to receive the running of the heap, which is ſome of the beſt part of it, and ſhould from time to time be thrown up again, which will quicken the fermentation."

It is ſuppoſed that "the richeſt compoſts may be made in the farm-yard, which ſhould be made deepening all round from the ſides to the middle in form of a hollow ditch or baſon. When the yard is made in this form, little of the urine or liquid part of the manure can run off or be waſted. When the dung is carried from the ſtables, cow-houſes, &c. into the farm-yard, it ſhould not be thrown careleſsly in heaps, each ſort by itſelf, but carried in carts or wheelbarrows, and laid regularly, and ſpread all over the yard. Upon this ſhould be ſpread a thin layer of earth, mud, the ſcowerings of ditches and ponds, green vegetables before they run to ſeed, and other ſuch materials as are moſt ſuitable to the nature of the land, to be manured with them. The racks and cribs out of which the cattle are foddered, ſhould be frequently moved over the yard, that the offal ſtraw and hay may be equally diſperſed, and trod in by the cattle. This method of ſpreading the dung and other materials being continued, the whole will be incorporated with the urine of the cattle, and make an extraordinary rich compoſt." It is ſuppoſed that the only inconveniency of this kind of compoſt, is its being filled with the ſeeds of weeds, from the earth mixed with it, the hay, ſtraw, and dung of the cattle. It is, therefore, a manure beſt ſuited to graſs-grounds, and to ſuch arable lands as are to be hoed, as turnips, cabbages, carrots, potatoes, beans, &c. as theſe weeds will in a great meaſure be deſtroyed by good hoeing," or a proper attention to the after culture of the crops. And the earth or mud gathered from the bottom of ditches is excellent for compoſts. It is uſually the lighteſt part of the ſoil, carried thither by water, and frequently contains a large proportion of vegetable matter. To this may be added, the cleanings of roads, eſpecially where they are laid with limeſtone. But one of the beſt materials for compoſts is peat-earth: this fills up the pores of a ſandy or gravelly ſoil, without diminiſhing its friability. Even where applied by itſelf to ſuch ſoil, peat increaſes its fertility. But in a hard clay ſoil, it ſhould be fermented with lime or dung, or both, and frequently turned, to make it mix properly. Without this precaution it dries, hardens, and cannot be afterwards properly mixed and incorporated with the ſoil. With regard to the making of compoſts, if only one ſort of manure be uſed, it is only neceſſary to put the manure and earth into alternate layers, in a long ridge, and top it ſo that the rain may not waſh through it. When both lime and dung are uſed, a layer of earth ſhould be interpoſed between every two beds of lime and dung; for lime, if mixed with dung in the firſt ſtage of its putrefaction, corrodes and diſſipates its effluvia. After the firſt fermentation of the dung is completed, the whole ſhould be turned, to mix the ingredients; and this operation ſhould be repeated until the maſs be ſufficiently pulverized; which is done by cutting the compoſt with a ſpade in perpendicular ſlices. All the weeds ſhould be collected from the neighbouring fields, before they run to ſeed, and mixed with the compoſt. The weeds alſo that grow upon it ſhould be buried down in it. Such kinds of compoſts may be uſed for any crop, and when ſufficiently pulverized, are excellent for a top dreſſing to paſtures; the parts being gradually crumbled down, and beaten into the ſoil by the feet of cattle, or waſhed in by rains. Some are of opinion, that no advantage reſults from mixing dung with earth; a bottom of earth, however, muſt always be uſeful to detain the moiſture that flows from the dung. Quicklime mixed with the dung is uſeful, by keeping the mucilage in a proper ſtate, and preventing the putrefaction from proceeding to too great a length. It has been obſerved, that making compoſt dunghills is a general practice in Norfolk. The principal ſource of them is the ſhovelings of ditches, which are found there to be ſingularly fertile. It is not the ſediment of water from the incloſures, but it conſiſts entirely of dead weeds, leaves of the hedge, and the mouldering of the bank and ſides of the ditch. The moſt barren ſub-ſtratum, expoſed a few years in the face of a ditch bank, is frequently changed into a rich black mould. Perhaps the ſea air, acting upon a looſe porous ſoil, may aſſiſt in producing this change. Other ſources of manure are uſeleſs turf, the backs of ditch-banks, the borders of fences in general, the ſides of lanes, the nooks of yards, and which, in many places, are ſuffered to remain the nurſery of weeds. Theſe are turned up into ridges, to rot the roots of the graſs and weeds, and to receive the melioration of the air; which done, they are carted in due ſeaſon to the dunghill, to be well incorporated with that ſubſtance. It is ſtated as a good and effectual mode of raiſing a large quantity of compoſt manure, to bed the farm-yard about two feet deep with earth, and on this cleanſe the ſtables, cow-houſes, hog-ſties, &c. and to move the cribs in which looſe cattle are fed, with ſtraw about it. This bed of earth will retain the urine, ſo that, when the whole is mixed together, it will all be nearly of equal goodneſs, and admirably adapted to gravelly and looſe ſoils in general, through which the eſſence of dung alone would be waſhed in one ſeaſon; and a top dreſſing of ſoot, pigeons' dung, &c. would laſt but one crop, and very rotten pure dung would be little better. Having the drains from the ſtables, cow-ſheds, and other offices, made ſo as to diſcharge themſelves into places where theſe different ſorts of earthy materials are depoſited, might be a cheap and expeditious method of procuring good compoſt-manure. And another good method of raiſing compoſt dunghills is by making them into clamps. Make a layer of hedge earth from a grubbed border, two feet deep, and about twelve feet ſquare, in the beginning of November; the quantity of earth will be about twenty-ſix loads of ſixteen buſhels each; on this clean all the yards and ſheds. The yard not being bedded with earth, ſhould be well littered, to ſoak up the urine, and to be made into dung by the hogs and looſe cattle; this may be cleaned once a fortnight, and the ſheds once a week, and piled regularly on the foundation of earth, until the heap is about ſeven feet high; and when one clamp is thus filled up, another foundation of earth may be laid adjoining to it. In order to enrich the compoſt, the flowings of the heap ſhould be prevented from running off, and thrown up occaſionally on it. By thus piling the compoſt in clamps, it will be in very good order for arable land early in the ſpring; which will not be the caſe if it be left to be trodden flat over the whole yard, and every particle waſhed by the rain. Fermentation goes on much quicker in this method; and it would be better ſtill if the heap were made under a roof, to keep off all water but what is thrown up. Another advantage of this method is, that any part of the compoſt may be uſed, by taking a diviſion of the hill that has been the longeſt finiſhed, and is conſequently in the moſt ſuitable ſtate for application. See Dung.

It is found that all ſorts of animal ſubſtances, mixed with earth, litter, or any vegetable material, make a rich compoſt. Saw-duſt, mixed in layers with the blood and offal of a ſlaughter-houſe, and incorporated till the whole becomes a moiſt fetid maſs, is a rich compoſt. Two loads of it, with three loads of earth. will be ſufficient for an acre of wheat or ſpring corn. Being a kind of top dreſſing, it ſhould be put on at the time of ſowing, and harrowed in with the grain. This kind of manure is beſt adapted to lands of an open texture. Tough clays require lime, and plenty of dung, to break the cohesion of their parts. As this compoſt takes up little room, it is very convenient for the uſe of ſuch farmers as are obliged to bring manures from a diſtance: it is alſo extremely rich, and will probably continue longer in the land than yard or ſtable dung. All animal ſubſtances being of the ſame nature, the refuſe of whale-fat, after the oil is boiled out, will make a rich compoſt with freſh dung, which will reduce the blubber ſpeedily into a putrid ſtate, or with earth and dung. Having marked out the length and breadth of your intended dunghill, make a layer of earth, ſuch as moor earth, or that of ant-hills, about a foot in thickneſs; over this put a layer of yard or ſtable dung of the ſame thickneſs, then a layer of blubber, and over that another layer of dung. Repeat the operation till the heap be raiſed about ſix feet, then give it a thick covering of earth, and coat the heap with ſods. In about a month, turn the whole in the uſual manner; and when turned, coat with earth as before, to confine the putrid ſteam. In a month or two, the heap will be conſiderably fallen, when it ſhould have a ſecond turning. This operation muſt be repeated at proper intervals, till the whole becomes an uniform putrid maſs. In general, this compoſt ſhould not be uſed till it is a year old. The heap muſt be guarded from dogs, ſwine, &c. This compoſt may with great advantage be applied to all purpoſes where good rotten dung is required. It is excellent for cabbages and for meadow ground. One hogſhead of whale refuſe will make eight loads of dung; and muſt be of great importance to ſuch farmers as lie at a diſtance from manure, but within reach of thoſe places where train oil is prepared. The practice of throwing this kind of offal into the ſea was highly wrong and inconſiderate. And it is obvious, that the refuſe of all ſorts of fiſh, and fiſh itſelf, when in ſhoals too great for conſumption in the way of food, may advantageouſly be made into a compoſt in the way above deſcribed. Theſe are local advantages; and are mentioned principally with a view to put farmers upon ſearching diligently for ſuch ſubſtances as are within their reach, that are capable of aſſiſting the ſheepfold and common dunghill, upon which in many places they rely wholly, however inadequate to their wants; abundance of good manure properly managed, being the life and ſoul of huſbandry. Where there is a deficeney of materials for making good compoſts, proper for the ſoil in many caſes, a mixture of different ſoils may anſwer the purpoſe. Thus, where clay predominates, the addition of ſand, where it is happily within reach, is often ſufficient to enſure fertility; and where ſand prevails, the addition of clay or chalk will anſwer the ſame purpoſe. Gravel enriches peat-moſs; and that in return improves gravel. The farmer ſhould, therefore, ſearch every where above ground and below, for ſuch ſubſtances as may improve his ſeveral ſoils, by being properly mixed with them.

In conſidering the nature of manures, and the methods of applying them to lands, under different circumſtances, further directions will be given in regard to the making and applying of compoſts. See Manure.

COMPOSTELLA, or St. Jago de Compostella, in *Geography*, a city of Spain, and capital of the province of Gallicia, with an archbiſhop's ſee and an univerſity, ſituated in a peninſula formed by the rivers Tambra and Ulla. N. lat. 42° 54′. W. long. 7° 17′. It has a great number of nunneries and monaſteries, and contains about 2000 houſes. The public ſquares, the churches, and particularly the cathedral, are magnificent. The Spaniſh military order of St. Jago derives its origin from this place, where the body of St. James is reported to lie buried, which circumſtance likewiſe uſed to draw a vaſt concourſe of pilgrims from moſt parts of Chriſtendom in former times.

The number of pilgrims who went thither from England in 1428, amounted to 916 perſons; in 1433 the number was 520; in 1434, 2460, and in 1445, 2100. It was the practice for the crown to grant licenſes to maſters of ſhips for carrying out a limited number of theſe votaries of ſuperſtition, who took with them conſiderable ſums of money, not only for their neceſſary expences, but for offerings and other charges incurred by this pilgrimage. See St. Jago.

Compostella *Nueva*, or *New Compoſtella*, a rich town of North America, in Old Mexico, or New Spain, in the province of Xaliſco, built by Nunez de Guſman in 1531, near the South ſea; 400 miles N.W. of Mexico. The ſoil is barren and the air inſalubrious; but it has ſeveral mines of ſilver at St. Pecaque, in its neighbourhood. N. lat. 21° 20′. W. long. 110° 12′.

COMPOUND, the reſult or effect of a compoſition of different things; or that which ariſes from them.

Strictly ſpeaking, every new compoſition does not produce a new compound; but only that from which a new eſſence ariſes. Thus, when one drop of water is added to another, there does not ariſe a new phyſical compound; the eſſence being the ſame now as before the union.

Compound differs from complex, and ſtands oppoſed to ſimple, which ſee reſpectively.

Compound, in *Botany*, applied to leaves, expreſſes their being compoſed of more than one piece, or leaflet, connected by a common footſtalk, which is either ſimple or branched. *Folium decompoſitum* is applied to a leaf more than once compounded, and *ſupra-decompoſitum* to any greater degree of ſuch conformation. See Leaf.

A compound flower is limited by Linnæus to that particular kind of aggregate flower, (ſee Aggregate,) whoſe florets are ſeſſile on a common receptacle, within a common calyx, and furniſhed with anthers united into a tube. Theſe are the excluſive characters of the great natural claſs *Syngeneſia*, the 19th in the Linnæan Syſtem, the laſt order of that claſs, *monogamia*, conſiſting of ſimple flowers, being now, by general conſent, diſuſed. Compound flowers conſiſt either of uniform perfect florets, each furniſhed with ſtamens and piſtils, and all ripening perfect ſeed; or of ſuch florets in the diſk, with female, or even neutral, ones in the radius; or, laſtly, of male florets in the diſk and female florets in the radius. Their partial corollas are either tubular and five-cleft, or ligulate, ſtrap-ſhaped. Their manner of becoming double is for the tubular and perfect florets of the radius to become ligulate and female only, or even neuter, which change is often extended to all the florets, even to the centre, in which caſe no ſeed is perfected. Sometimes the ligulate florets become not only abortive, but tubular, or quilled. The prevailing colour of compound flowers is yellow, eſpecially their diſk. The ligulate radius is often white, red, or blue, with a yellow diſk, but if the radius be yellow, the diſk is never of any other colour, except what ariſes from the anthers or ſtigmas.

COMPOUND *Force, Forms, Foſſils, Fractions, Fracture, Gland, Harmony.* See the ſubſtantives.

COMPOUND *intereſt*, called alſo *intereſt upon intereſt*, is that which is reckoned not only upon the principal, but upon the intereſt itſelf forborn; which hereby becomes a ſort of ſecondary principal. See INTEREST.

COMPOUND *Larceny.* See LARCENY.

COMPOUND *Machine, Maſonry.* See the ſubſtantives.

COMPOUND *motion,* that motion which is effected by ſeveral conſpiring powers.

Powers are ſaid to conſpire, if the direction of the one be not directly oppoſite to that of the other; as when the radius of a circle is conceived to revolve about a centre; and at the ſame time a point to move ſtraight along it.

All curvilinear motion is compound.

It is a popular theorem, in *Mechanics,* that in an uniform compound motion, the velocity produced by the conſpiring powers, is to that of either of the powers ſeparately, as the diagonal of a parallelogram, according to the direction of whoſe ſides they act ſeparately, to either of the ſides. See COMPOSITION *of motion.*

COMPOUND *numbers.* See COMPOSITE.

COMPOUND *pendulum,* in *Mechanics,* that which conſiſts of ſeveral weights conſtantly keeping the ſame diſtance, both from each other, and from the centre about which they oſcillate. See PENDULUM.

COMPOUND *propoſition.* See PROPOSITION.

COMPOUND *quantities,* in *Algebra,* are ſuch as are connected together by the ſigns + and −: thus, $a + b - c$, and $bb - b$ are compound quantities.

COMPOUND *ratio* is that which the product of the antecedents of two or more ratios has to the product of their conſequents. Thus 6 to 72 is a ratio compounded of 2 to 6, and 3 to 12. See PROPORTION and COMPOSITION *of ratios.*

COMPOUND *Sounds, Surd, Taſte, Ulcer, Words.* See the ſubſtantives.

COMPOUND *ſtops* on an organ, are ſuch wherein each finger-key acts upon two, three, four, or even five pipes of different pitches, and cauſes them all to ſound together, whenever a key in this ſtop is put down. The moſt common of theſe are the CORNET, the SESQUIALTER, and the MIXTURE, or furniture ſtops, (ſee theſe articles;) the uſe of theſe compound ſtops with others which are not tuned to the actual note which they repreſent, or that on the diapaſon ſtop, but to the XIIth or XVIIth thereof (ſee TWELFTH, TIERCE, and LARIGOT, *Stops*) is to introduce an inconceivable number of actual diſcords into the common chord, even during full performances, as any perſon may, at leiſure, ſatisfy himſelf, by writing down the ſeveral notes produced by a chord formed of the ſtops above-mentioned, combined with the diapaſon and other uniſonant ſtops, or by putting down all the keys on a piano-forte at the ſame time, to which a chord on theſe ſtops anſwers. No problem in the ſcience of harmonics is more difficult of ſolution, than to account for the ear's receiving pleaſure from ſuch a confuſed and diſſonant aſſemblage of ſounds: and it can only perhaps be accounted for by ſuppoſing, that the concordant notes being ſo many more in number in theſe kinds of chords, overpower and drown the diſcords to ſuch a degree, that the ear is able by a ſort of mental exertion to paſs over and not attend to the latter, any more than to the rattling of the keys of a badly conſtructed harpſichord, or the noiſe of carriages in the ſtreet adjoining a concert-room, &c.

COMPOUNDED IDEA, in *Logic,* unites ſeveral ideas of a different kind, which are uſually conſidered as diſtinct ſingle beings, whether thoſe united ideas be ſimple or complex. See COLLECTIVE *idea.*

COMPOUNDING FELONY, in *Law.* See THEFT-BOTE.

COMPOUNDING *of informations* upon penal ſtatutes, is an offence of an equivalent nature to CHAMPERTY in criminal cauſes; and, beſides, it is an additional miſdemenſor againſt public juſtice, by contributing to make the laws odious to the people. At once therefore to diſcourage malicious informers, and to provide that offences, when once diſcovered, ſhall be duly proſecuted, it is enacted by ſtatute 18 Eliz. c. 5, that if any perſon, informing under pretence of any penal law, makes any compoſition without leave of the court, or takes any money or promiſe from the defendant to excuſe him, (which demonſtrates his intent in commencing the proſecution to be merely to ſerve his own ends, and not for the public good), he ſhall forfeit 10*l.*, ſhall ſtand two hours on the pillory, and ſhall be for ever diſabled to ſue on any popular or penal ſtatute.

COMPREHENSION, in *Engliſh Church Hiſtory,* denotes a ſcheme propoſed by ſir Orlando Bridgman in 1667-8, for relaxing the terms of conformity in behalf of proteſtant diſſenters, and admitting them into the communion of the church. A bill for this purpoſe was drawn up by lord chief baron Hale, but diſallowed. A project to the ſame purpoſe was propoſed and argued in parliament ſoon after the reſtoration, in 1661; but the royaliſts and zealous churchmen formed a majority, and the endeavours of thoſe who wiſhed to avail themſelves of the king's declaration to this effect, proved ineffectual. The attempt was renewed by Tillotſon and Stillingfleet in 1674, and the terms were ſettled to the ſatisfaction of the non-conformiſts, but the biſhops refuſed their aſſent. This ſcheme was likewiſe revived again immediately after the Revolution; the king and queen expreſſed their deſire of an union: however the deſign failed after two attempts; and the act of TOLERATION was obtained. Birch's Life of Tillotſon, p. 42, 167, &c.

COMPREHENSION, in *Metaphyſics,* is that act of the mind, whereby it apprehends, or knows, any object preſented to it, on all the ſides, whereon it is capable of being apprehended, or known.

To comprehend a thing, is defined by the ſchoolmen, *rem aliquam totam & totaliter cognoſcere.* See APPREHENSION.

COMPREHENSION, in *Rhetoric,* a trope, or figure, whereby the name of a whole is put for a part; or that of a part for a whole: or a definite number of any thing for an indefinite.

COMPREIGNAC, in *Geography,* a town of France, in the department of the Upper Vienne, and diſtrict of Bellac; 10 miles N. of Limoges.

COMPRESS, in *Surgery,* from the Latin word *comprimere,* to preſs together, is a bolſter of linen cloth folded ſeveral times, and employed on various occaſions.

Compreſſes are formed ſometimes of lint or ſurgeon's tow, but more commonly of half-worn linen without ſeam or ſelvage. The ſize, thickneſs, and form of them, muſt be regulated by the part to which they are applied, or the object which the ſurgeon has in view.

When they are intended to cover other dreſſings to a wound, &c., they muſt be always larger than the ſubjacent plaſters, and muſt lie upon the part in an equal and even manner, ſo as to retain the dreſſings ſteadily on the affected part.

Compreſſes are divided into ſimple and graduated. A ſimple compreſs conſiſts of linen or flannel folded from two to eight times; and are made quadrangular, triangular, or with pieces cut off a ſquare at the corners, ſo as to give the compreſs a crucial form, &c. A graduated compreſs conſiſts in a number of ſimple ones laid one above the other, and ſometimes ſewed together in the ſhape of a pyramid; theſe latter are uſed for compreſſing a bleeding artery, or they are applied to the bottom of a fiſtulous ſore, or to the ſides of a deep fleſhy wound, or upon ganglions, and ſome other tumours, in order to diſperſe them.

Compreſſes are employed to fill up inequalities, or hollow parts of the body; they are alſo uſed to guard wounds againſt the contact of irritating ſubſtances, and ſometimes merely to receive the purulent diſcharge. They are frequently moiſtened with different medicated fluids, and are applied either warm or cold according to the ſurgeon's intention.

Compreſſes are ſometimes of conſiderable length, and of little breadth, eſpecially when employed to the extremities of the body in a circular form, after the manner of common bandages. (See BANDAGE.) The latter kind of bandage is named by the French *longuette*. The methodical application of ſuch compreſſes has effected a cure in ſome aneuriſms: they are alſo found particularly uſeful in ſinuoſities and deep ſores, where matter is apt to collect and require counter openings. From the various uſes of compreſſes, writers have named them contentive, uniting, diverſive, &c.

Tourniquets, truſſes, and ſome other ſurgical inſtruments, are only particular kinds of compreſſes. (See ANEURISM, and HERNIA.) Compreſſion is now and then made very advantageouſly by means of the finger only, and will often ſtop a violent bleeding in parts where no ſurgical apparatus can be employed. Thus the root of the noſe is compreſſed with the fingers, in order to ſtop violent ſneezing, and the crown of the teeth in order to relieve the tooth-ach; and in order to make polypi ſuppurate, ſphacelate, or fall-off, their roots are compreſſed between the fingers. A great number of the bandages that are uſed, produce their effects merely by the ſupport which they give to the parts.

The diverſity of caſes in which a ſkilful ſurgeon will employ compreſſion with advantage, cannot here be detailed; but in addition to what has already been ſaid, we may add that by this means alone dropſical ſwellings may frequently be diſſipated; and of this, Mr. John Bell records a ſtriking example in his "Principles of Surgery," 4to. vol. i. p. 128, where he treats of bandages in general. By the way, we may mention, that Mr. John Bell has here given ſome excellent general obſervations; but (as in other parts of his writings) he affects to have read in authors what no one elſe can find; and in the inſtance before us, he pretends to have read "the treatiſes of Soranus, Glaucus, and Diocles, in which," he ſays, "I find nothing but what has fallen into deſerved neglect;" whereas theſe authors have not written any treatiſes upon bandages that have deſcended to the preſent generation! Well might this author aſk the queſtion, "Why ſhould we go back to the ancients in this pitiful manner?"

COMPRESSED *Foſſils*, this term is applied by naturaliſts to various extraneous ſubſtances found in the earth, which ſeem to have ſuffered a flattening or change of ſhape, from the weight of the ſuperincumbent ſtrata; this is not uncommon with foſſil ſhells, of large ſize compared with their thickneſs, as echini, &c., and ſhould be particularly noted in deſcribing the circumſtances of any ſtratum, where ſuch compreſſed foſſils appear.

The mountains of Quedliac and Portfiallet in Norway, contain an argillaceous pudding-ſtone, the ſiliceous pebbles of which have been thought by ſome to be compreſſed, becauſe thoſe in the lower part of the ſtratum are progreſſively thinner than thoſe above (Kirwan's Geo. Exp. 8.); but this probably was their original ſhape. The ſmall black chert pebbles, which form uniform layers in the lower part of the London clay ſtratum, are all of them ſomewhat flat, but certainly not by compreſſion, we think.

Bituminized wood, or the reſemblance of trunks of trees in wood-coal, is often found flattened, as at Todi, and near Aqua-Sparta in Umbria, at Thun in Switzerland, in Iceland, &c. Siliceous petrifactions have frequently ſomewhat the appearance of compreſſed wood, and have been ſo denominated; but a careful examination of ſeveral ſpecimens, in which the tranſverſe ſection preſented two equal ſegments of circles joined together by their chords, inſtead of a diſtorted ellipſis, which would probably be the form of round wood when compreſſed, has induced us to think that theſe, and probably many extraneous foſſils ſaid to be compreſſed, may originally not have been round.

Peat-foſſils of the preſent race, ſuch as the trees found in the ſea at Sutton in Lincolnſhire, and in other places, have without doubt been flattened, by the weight of peat and earth lying upon them, when in a ſoft and decaying ſtate.

COMPRESSION, from the Latin *compreſſio*, is the act of preſſing, or ſqueezing matter together, ſo as to force its parts nearer to one another, and enable the whole to occupy a ſmaller ſpace; or the effect produced by that cauſe. *Compreſſion* and *condenſation* denote the production of the ſame effect; that is, the reduction of a certain quantity of matter into a ſmaller ſpace; with this difference, however, that when the effect is produced by the application of any external force, as by the preſſure of a ſuperincumbent fluid, or by means of mechanical engines, it is more properly denominated *compreſſion*; but when the effect is produced by ſome internal action, as by the eſcape of caloric in cooling, it is then called CONDENSATION, which ſee.

Compreſſion takes place in various natural proceſſes, and it is alſo practiſed by art for various mechanical and economical purpoſes. The inquiries which may be made concerning it, are, 1ſt, the principal caſes in which compreſſion is produced in nature; 2dly, the mechanical methods which are uſed for compreſſing bodies in manufactories and in civil economy; and 3dly, the principal effects which reſult therefrom. Of the natural compreſſions, thoſe which ariſe from the weights of ſuperincumbent ſolids are ſufficiently obvious, and they will, beſides, be particularly examined under the articles GRAVITY, and MECHANICS; but thoſe which are occaſioned by fluids, being much leſs evident, are ſeldom ſufficiently underſtood even by thoſe who are concerned with them.

Water and air are the two fluids with which mankind is naturally and unavoidably concerned; and the preſſures of thoſe fluids differ materially from each other. The preſſure of water is proportionate to its perpendicular height and not to its quantity, and that preſſure is exerted in every direction; for inſtance, let two veſſels of the ſame height, but of different ſizes, as a ſmall pipe and a large reſervoir, be filled with water to the ſame height; then if you meaſure a ſquare inch in the bottom of the ſmall pipe, and a ſquare inch in the bottom of the reſervoir, the preſſure upon thoſe two different ſquare inches is the ſame; though the reſervoir may contain twenty or thirty thouſand times more water than the pipe. Alſo, if you take a ſquare inch on the ſide of the veſſel cloſe to the bottom, the lateral preſſure upon it will be equal to the preſſure on the ſquare inch of the bottom; excepting indeed a trifling difference which ariſes from the perpendicular height of the water above the latter, which barely exceeds the perpendicular height of the water above the former.

But though water preſſes upon every body that is immerſed in it in proportion to its perpendicular height, and tends to force the parts of thoſe bodies cloſer to each other, provided that thoſe bodies have not pores large enough to admit the water; yet water is not itſelf ſuſceptible of compreſſion, unleſs it be in a very ſlight, and ſcarcely perceptible degree; hence at different depths, water is nearly, if not exactly, of the ſame denſity.

The air of the atmoſphere, as well as the other aerial fluids, is highly elaſtic, in conſequence of which it not only preſſes upon all bodies that are immerſed in it: but, by preſſing upon itſelf, its own denſity is rendered different at different altitudes. The bulk of a given quantity of air has been found to decreaſe in the direct ratio of the force with which it is compreſſed; hence it has been demonſtrated, that if the altitudes above the ſurface of the earth be taken in arithmetical progreſſion, the denſities of thoſe altitudes will be in geomtrical progreſſion decreaſing If a very long tube, cloſed at one end be filled with water, and then be inverted in a baſon of water, that fluid will remain ſuſpended in it to the height of about 33 feet, that weight of water being counterpoiſed by the preſſure of the atmoſphere: (ſee the articles ATMOSPHERE, PNEUMATICS, and HYDROSTATICS.) Therefore, ſince a man on the ſurface of the earth is preſſed by the weight of the atmoſphere, if he places himſelf at 33 feet below the ſurface of the water, he will be preſſed by twice the above-mentioned weight of the atmoſphere; if he places himſelf at 66 feet below the ſurface of the water, he will ſuſtain a preſſure equal to three atmoſpheres, and ſo on.

If the abovementioned experiment be tried with a tube filled with and inverted in a cup of quickſilver, inſtead of water, it will be found that the quickſilver will remain ſuſpended in it to the height of about 30 inches, the ſpecific gravity of quickſilver being much greater than that of water. As the preſſure of the atmoſphere counterpoiſes a perpendicular pillar of quickſilver about 30 inches high, or, more accurately ſpeaking, between 28 and 31 inches; for it varies between thoſe limits (ſee BAROMETER); the weight of ſuch a pillar, let its baſe be what it may, ſhews the preſſure of the atmoſphere upon a ſurface equal to that baſe. A pillar of quickſilver, whoſe baſe is an inch ſquare, and whoſe altitude is a mean between 28 and 31 inches, weighs $14\frac{1}{2}$ pounds avoirdupoiſe; therefore, at a mean, the preſſure of the atmoſphere upon every ſquare inch on the ſurface of the earth, is equal to $14\frac{1}{2}$ pounds; and by the rule of proportion, or by ſimple multiplication, we may determine the weight of the atmoſphere upon any other given ſurface. Thus the preſſure of the atmoſphere on a ſquare foot, (which is equal to 144 ſquare inches) is 2088 pounds. The preſſure on the body of a middle ſized man, whoſe ſurface is equal to about 12 ſquare feet, is 25056 pounds; and the preſſure on the ſurface of the whole earth is equal to about 11642019840000000000 pounds. For further explanation of the mechanical properties of fluids in general, ſee the articles referred to above, and likewiſe the article ELASTICITY.

The artificial methods of compreſſing ſubſtances, either ſolid or fluid, as employed in the arts, and for economical purpoſes, are very numerous; different compreſſing inſtruments being uſed for almoſt every particular purpoſe. Thus there are hammers, levers, ſcrew-preſſes, hydraulic preſſes, condenſing engines, rolling or flatting mills, &c. Thus the apothecary obtains his expreſſed oils by means of a ſcrew-preſs, the book-binder compreſſes the leaves of his books, both with the hammer, and with a ſcrew-preſs of a different form; the gold-beater compreſſes and ſtretches his metallic plates firſt through the rolling (or flatting) mill, and then by the ſtrokes of a hammer, and ſo forth. Deſcriptions of thoſe inſtruments may be ſeen under their different names.

Beſides the above-mentioned mechanical properties, compreſſion produces ſome remarkable phyſical effects, of which it will be neceſſary to give a diſtinct account. We ſhall, however, previouſly to this, briefly ſtate the diſcoveries that have been made with reſpect to the compreſſibility of water, which, as has been already mentioned, is ſo very ſlight as to be next to nothing.

Water was, during a very long period, conſidered as a fluid perfectly unelaſtic; that is, unyielding, or incompreſſible; and this opinion was corroborated by an experiment of the Academy del Cimento in Italy. About a century and a half ago the members of that academy endeavoured to aſcertain whether water was capable of being compreſſed in any degree. For this purpoſe, they filled a hollow metallic ſphere with that fluid, and ſtopped the aperture very accurately. This ball then was preſſed in a proper machine, but no contraction could be obſerved, nor indeed was the apparatus capable of manifeſting ſmall degrees of compreſſion. Hence they concluded that water was not capable of compreſſion. This opinion prevailed until the year 1761, when the ingenious Mr. Canton diſcovered the compreſſibility of water, and of other liquids, which he immediately made known to the Royal Society. He took a glaſs tube, having a ball at one end; filled the ball and part of the tube with water, which he had deprived of air as much as it was in his power; then placed the glaſs thus filled under the receiver of an air-pump; and on exhauſting the receiver, which removed the preſſure of the atmoſphere from over the water and the glaſs veſſel which contained it, in conſequence of which the water roſe a little way into the tube, *viz.* expanded itſelf. He then placed the apparatus under the receiver of a condenſing engine, and on forcing the air into it, which increaſed the preſſure upon the water, a diminution of bulk evidently took place; the water deſcending a little way within the tube. "In this manner," Mr. Canton ſays, "I have found by repeated trials, when the heat of the air has been about 50°, and the mercury at a mean height in the barometer, that the water will expand and riſe in the tube by removing the weight of the atmoſphere, one part in 21740; and will be as much compreſſed under the weight of an additional atmoſphere. Therefore the compreſſion of water by twice the weight of the atmoſphere is one part in 10870."

"Water has the remarkable property of being more compreſſible in winter than in ſummer, which is contrary to what I have obſerved, both in ſpirit of wine and oil of olives."

By the ſame means, and in the ſame circumſtances, Mr. Canton aſcertained the property of being compreſſed in ſome other fluids, and the reſults are as in the following table:

Compreſſion	of ſpirit of wine	66	millionth parts.
	of oil of olives	48	
	of rain water	46	
	of ſea water -	40	
	of mercury -	3	

Mr. Canton was of opinion that the above-mentioned diminution of bulk under the receiver of the condenſing engine, is not to be attributed to any air contained in the water, or any of the other fluids; becauſe when he tried the experiment with water which had been forced to imbibe more than an uſual quantity of air, the compreſſion did not appear to be greater. Yet it may be obſerved, that conſidering the ſlight degree of compreſſion which water is capable of, and the difficulty of depriving water entirely of air, one might ſtill be induced to doubt whether that compreſſion is not to be attributed to the air. See Canton's account of thoſe experiments in the 52d and 54th vols. of the Philoſophical Tranſactions.

With reſpect to the effects produced by compreſſion, it is in the firſt place to be remarked, that certain bodies, when preſſed, ſuffer a derangement of form; but as ſoon as the preſſure is removed, they recover their former ſhape. Thoſe bodies are ſaid to be *elaſtic*, and they are diſtinguiſhed into *perfectly elaſtic*, when they recover their former bulk and ſhape entirely, as is the caſe with common air, and *imperfectly elaſtic*, when they recover their former ſhape only in part, which is the caſe with far the greateſt number of bodies.

When the bulk of a body is reduced by compreſſion, the ſpecific gravity of that body is proportionately increaſed; thus the ſpecific gravity of fine gold, that has been fuſed only, is 19,258; but the ſpecific gravity of the ſame, after having been hammered, is 19,362. The ſpecific gravity of pure ſilver, that has only been fuſed, is 10,474; that of the ſame hammered, 10,511. The ſpecific gravity of copper, ſimply fuſed, is 7,788; that of the ſame hammered, is 8,878, and ſo forth.

Whenever the bulk of a body, and eſpecially of a metallic one, is diminiſhed in bulk by hammering, flattening between rollers, or by any other ſort of compreſſion, its hardneſs or rigidity is increaſed at the ſame time; thus ſoft braſs, or ſilver, or copper, by hammering, or preſſing, is rendered hard and elaſtic. By the application of a degree of heat, ſomewhat lower than incandeſcence, that hardneſs or elaſticity of the metal is removed, and at the ſame time its ſpecific gravity becomes equal to what it was before the hammering. This proceſs is called *annealing* or *ſoftening*.

The other remarkable effects of preſſure may be reduced to three; namely, a modification of the action of the ſame degree of heat on bodies, an extrication of heat, and an extrication of light. When heat is applied to any body, the effects differ according as the application takes place under different atmoſpherical preſſures. On the tops of mountains, where the preſſure of the atmoſphere is conſiderably leſs than it is on the level of the ſea (in conſequence of which the quickſilver does not ſtand ſo high in the barometer in the former place as it does in the latter), water boils at a lower temperature; and ſo do other fluids. At the level of the ſea, water boils at about the temperature of 212° of Fahrenheit's thermometer; but Mr. Sauſſure found on Mount Blanc (which is reckoned the higheſt mountain of any in Europe; where the barometer ſtood at 17,05 Engliſh inches), that the heat of boiling was 185½°. From the experiments of Sir George Shuckburgh, and of Mr. De Luc, the following table of the heats of water boiling under different preſſures of the atmoſphere, which are indicated by the altitudes of the mercury in the barometer, was calculated by Mr. Kirwan.

Heat of boiling water under different barometrical altitudes

Baromᵗ.	Heat.	Baromᵗ.	Heat.
30	212°	21	195,36
29	210,28	20	193,36
28	208,52	19	191,06
27	206,73	18	188,46
26	204,91	17	185,56
25	203,06	16	184,36
24	[illegible]	15	[illegible]
23	[illegible]	14	[illegible]
22	[illegible]		

Mr. Watt obſerved, that in a very good vacuum water boils, or produces copious vapours, even when its heat is not greater than 70°. On the other hand, when water is cauſed to boil under a great preſſure, a much greater degree of heat muſt be applied: thus, in Papin's digeſter (being a ſtrong veſſel in which a quantity of water is confined) the water may be rendered nearly red-hot; and in that ſtate the diſſolving property of water is increaſed prodigiouſly. In Iceland a natural diſcharge of hot water comes out of a deep pit, and when this water falls upon the ſurface of the earth, it depoſits a white powdery ſiliceous ſubſtance, which, it is ſuppoſed, the water was enabled to diſſolve by the volcanic heat, that acted upon it under a great degree of compreſſion.

Dr. Hutton, like ſome other geologiſts, has aſcribed the formation of the various minerals chiefly to the action of ſubterraneous fire; but he thought that that action was modified by the compreſſion of the ſuperincumbent ſtrata of the earth, which rendered it capable of producing ſuch effects as could not be eaſily imitated on the ſurface of the earth; for it ſeemed to him, that under a great degree of compreſſion, volatility would expoſe to a high degree of heat ſuch ſubſtances as generally fly off in our fires, on the ſlighteſt application of heat. Hence, by their chemical relations peculiar combinations might ariſe; ſuch as are dug from the bowels of the earth. What Dr. Hutton ſuppoſed, was in a great meaſure verified by ſir James Hall, bart., who, by his numerous and well imagined experiments, has ſhewn a variety of remarkable effects, on different ſubſtances, by the action of heat modified by compreſſion; but his intereſting experiments will be deſcribed amongſt the effects of heat.

The other two remarkable effects of compreſſion on bodies, are an extrication of heat and an extrication of light. Theſe effects having been obſerved with all thoſe bodies which may be ſubjected to deciſive experiments; it may be preſumed from analogy, that the ſame effects take place in various degrees, with all bodies which are ſuſceptible of compreſſion, but not with thoſe which are not compreſſible; and, in fact, liquids which are only compreſſible in the ſlighteſt degree imaginable, cannot be heated by agitation, which is friction amongſt their particles; and there is no friction without compreſſion. As heat is evolved from a body when compreſſed, ſo when the bulk of a body is enlarged, heat is abſorbed, in conſequence of which the ſurrounding bodies are cooled; and this abſorption of heat ſeems to be directly proportioned to the enlargement of bulk. The following inſtances will illuſtrate the nature of theſe remarkable effects. The blackſmith, by about twenty ſtrokes of the hammer upon a piece of iron bar not thicker than a man's little finger, can render one extremity of it red-hot, viſible in the day light. But it is to be remarked, that the ſame extremity of the iron bar cannot be rendered

red-hot a ſecond time, unleſs it be previouſly ſoftened in the fire. The condenſation of common air, quickly performed, produces a conſiderable degree of heat; ſo much ſo, that cotton has been ſet on fire, and ſo has heated charcoal, by compreſſing the air quickly upon it. An ingenious mechanic in Paris is ſaid to have kindled tinder in tubes, or compreſſing pumps, of about a quarter of an inch in diameter, and ſix inches in length, by a ſingle ſtroke of the piſton. Steam, alſo, by mechanical compreſſion, may be made to yield its latent heat. A mixture of oxygen and hydrogen gaſes, if quickly compreſſed, takes fire and explodes with great force. The diſcharge of an air-gun is attended with a faint flaſh of light, viſible in a darkened room; and the ſudden compreſſion of the air in a tube, to the end of which a ſtrong glaſs is fitted for the purpoſe of manifeſting what paſſes within, is likewiſe attended with light.

In explanation of theſe phenomena, it is ſuppoſed, that independent of the ſpecific caloric, peculiar to every body, a quantity of it is lodged in the pores of each body, and that this may be extricated by compreſſion, in the ſame manner as water is ſqueezed out of a ſponge. But a farther examination of facts will throw more light upon the ſubject.

It is well known, that friction amongſt ſolids generates heat, which often occaſions actual inflammation and combuſtion. Thus the axles of wheels of carriages, and other machines, are ſometimes ſet on fire by the violence of the friction; thus, in a turning lathe, the pieces of work are heated to a great degree; thus, the violent colliſion of a ſteel againſt a flint, renders the abraded particles of the former perfectly red-hot. Count Rumford, willing to inveſtigate the origin of the heat produced by means of friction, inſtituted an intereſting ſeries of experiments in the workſhops of the military arſenal at Munich, where cannons are bored; in which caſe a degree of heat far exceeding that of boiling water is produced. After having examined the temperature of the metallic ſhavings, their quantity, capacity for containing caloric, &c. and finding reaſons ſufficient to account for the production of that remarkable quantity of heat which was manifeſted in the courſe of the boring, he began to conſider which way that heat might be derived, whether from the contiguous metal or from the air, and in order to determine the matter by means of actual experiment, he contrived a ſuitable apparatus, the principal part of which was intended to turn a piece of metal in a box full of water, whilſt a blunt borer acted forcibly againſt it, ſo as to produce a conſiderable degree of friction, without abrading from the piece of metal more than an inconſiderable quantity of it in a ſcaly powdery ſtate. With this apparatus, in which both the piece of metal and the borer were plunged in water of the temperature of the atmoſphere, no heat could be derived from the air. The machine which turned the piece of metal being put in motion, the water in the box, &c. began to be heated ſoon after, and in 2½ hours time, from the commencement of the operation, the water actually boiled. The reſult of this experiment ſhewed, that the heat, which had cauſed the water to boil, was not derived from the air, and from computation it appeared, that the abraded metallic powders could not furniſh it in conſequence of the change of their capacity. "Is it poſſible," count Rumford ſays, "that the heat could have been ſupplied by means of the iron bar, to the end of which the blunt ſteel borer was fixed? or by the ſmall neck of gun-metal by which the hollow cylinder was united to the cannon?" "Theſe ſuppoſitions appear more improbable even than either of thoſe before-mentioned; for heat was continually going off, or *out of the machinery*, by both theſe paſſages, during the whole time the experiment laſted. And in reaſoning on this ſubject, we muſt not forget to conſider that moſt remarkable circumſtance, that the ſource of the heat generated by friction, in theſe experiments, appeared evidently to be *inexhauſtible*. It is hardly neceſſary to add, that any thing which any inſulated body, or ſyſtem of bodies, can continue to furniſh without limitation, cannot poſſibly be a *material ſubſtance*; and it appears to me to be extremely difficult, if not quite impoſſible, to form any diſtinct idea of any thing, capable of being excited and communicated in the manner the heat was excited and communicated in theſe experiments, except in *motion*." Phil. Tranſ. for the year 1798.

It ſeems ſtrange that ſo diſtinguiſhed a philoſopher as Count Rumford ſhould be induced to admit the immateriality of heat from the reſult of the above-mentioned experiment, without adverting to the compreſſion which the metal muſt have received from the action of the borer.

Having mentioned the principal effects which ariſe from compreſſion, amongſt which the extrication of heat has been reckoned the moſt intereſting; we might now ſtate ſeveral inſtances of the contrary effect, namely, of the abſorption of heat attending the enlargement of bulk which takes place in ſeveral bodies after the removal of the cauſe which occaſioned their compreſſion. With reſpect to this, however, we need not be very prolix in this place. The hydraulic engine at Schemnitz furniſhes a ſtrong inſtance of the latter effect. That engine operates by cauſing a fall of water to compreſs air in a ſtrong veſſel, the re-action of which forces other water to riſe in another pipe for certain purpoſes. Now, in conſequence of the great height of the ſuperincumbent column of water, the air in the air-veſſel of this machine, is very much compreſſed, and it is ſaid that if the ſtop cock of this veſſel is opened, the air, in ruſhing out of it and expanding itſelf, abſorbs ſo much heat, and, of courſe, cools the adjacent bodies ſo much, as to produce a copious depoſition of moiſture from the atmoſphere, and the actual formation of ice upon the ſtop-cock. The cold produced by the evaporation of water, and eſpecially by that of ſpirituous liquors, might be likewiſe adduced as inſtances of the above-mentioned property. But the farther inveſtigation of theſe latter phenomena belongs to other branches of natural philoſophy, which will be explained in other places.

The term *compreſſion*, in aſtronomy and geography, has often been uſed to denote that diminution of the curvature of the ſurface of the earth, which has been obſerved about the poles, as if the earth had been compreſſed at the poles by ſome external force, which cauſed it to loſe its perfect ſpherical form, and to aſſume nearly that of an oblate ſpheroid; it being, however, well known that the ſpheroidical figure ariſes from the centrifugal force of the parts diſtant from the poles, which is likewiſe the caſe with the other planets. The preciſe quantity of deviation of the polar regions of the earth from the ſpherical form, or the difference between the equatorial and polar diameters, has been variouſly ſtated by different aſtronomers. Sir Iſaac Newton, ſuppoſing the denſity of the earth to be uniform, has aſſigned $\frac{1}{230}$ for the difference of the above-mentioned two diameters. Boſcovich, taking a mean of all the different meaſurements, found the difference of the two diameters equal to $\frac{1}{248}$. From other meaſurements and calculations ſince made by other able mathematicians, this difference has been reckoned equal to $\frac{1}{311}$ or $\frac{1}{300}$ by De la Lande; to $\frac{1}{321}$ by De la Place; to $\frac{1}{307}$ by Sejour; to $\frac{1}{305}$ by a late anonymous writer. Theſe latter reſults agree pretty well with the lengths of the pendulums, which have been

been found to vibrate ſeconds in different latitudes; ſo that upon the whole $\frac{1}{330}$, or a fraction not much differing from this, ſeems to be the neareſt to the true difference of diameters; and the diſagreement between the different meaſurements probably ariſes from the imperfection of inſtruments, from the partial attraction of mountains, and from the unequal denſity of the earth. See profeſſor Playfair's paper on the figure of the earth, in the Tranſactions of the R. Society of Edinburgh, vol. v. p. 1.

Compression, in *Surgery*, not only ſignifies the act of compreſſing, but denotes a claſs of diſeaſes produced by the preſſure of an extraneous body; and, in ſome caſes, a compreſſion will cauſe the moſt ſerious conſequences. For example, compreſſion of the brain, ariſing from a fracture of the cranium, and a portion of the bone in a depreſſed ſtate, may occaſion inflammation, ſuppuration, and deſtruction of that part of the brain to which the mechanical effect is applied; which will be, more or leſs, attended by comatoſe ſymptoms, and privation of ſenſe or voluntary motion. In ſuch caſes, the ſurgeon endeavours to remove the cauſe, by elevating the edge of the bone, or extracting it entirely, either with or without trepanning, as the circumſtances may indicate. (See Trepanning and Trephine.)

When the ſymptoms of a compreſſed brain are evidently marked, no time ought to be loſt in ſetting about an examination of the ſtate of the cranium, wherever appearances point out, or even lead us to conjecture, in what part a fracture may be ſituated. For this purpoſe an inciſion is to be made upon the ſpot through the integuments to the ſurface of the bone, which muſt be ſufficiently expoſed to admit of a free examination. Some authors have recommended a crucial inciſion; others one in form of the letter T; while many adviſe a conſiderable part of the integuments to be entirely removed. But as it is more agreeable to the preſent mode of practice to ſave as much of the ſkin as poſſible, a ſimple inciſion is generally preferred, unleſs the fracture run in different directions, and then the inciſion muſt vary accordingly. It will frequently happen, that a conſiderable part of the integuments muſt be ſeparated from the ſkull, in order to obtain a diſtinct view of the full extent of the fracture; but no part of the integuments is to be entirely removed. When blood-veſſels of any conſiderable ſize are divided, either before or at the time of the examination, they ought to be allowed to bleed freely, as in no caſe whatever is the loſs of blood attended with more advantage than the preſent. When, however, it appears that the patient has loſt a ſufficient quantity, the veſſels ought to be ſecured.

After the integuments have been divided, if the ſkull be found to be fractured and depreſſed, the nature of the caſe is rendered evident; but even where there is no external appearance of fracture, tumour, diſcolouration, or other injury, if the patient continue to labour under ſymptoms of a compreſſed brain, if the pericranium has been ſeparated from the bone, and eſpecially if the bone has loſt its natural appearance, and has acquired a pale white or duſky yellow hue, the trepan ought to be applied without heſitation, at the place where theſe appearances mark the principal ſeat of the injury. Again, although no mark, either of fracture or of any diſeaſe underneath, ſhould appear on the outer table of the bone, yet there is a poſſibility that the inner table may be fractured and depreſſed. This indeed is not a common occurrence, but it happens perhaps more frequently than ſurgeons have been aware of; and where it does happen, the injury done to the brain is as great, and attended with as much danger, as where the whole thickneſs of the bone is beaten in. The application of the trepan is therefore uſually deemed a neceſſary meaſure.

But if, after the application of the trepan, it happens that no mark of injury appears either in the outer or inner table in that part, or in the dura mater below it, and that the ſymptoms of a compreſſed brain ſtill continue, a fracture in ſome other part is to be ſuſpected; or that kind of fracture termed by practitioners *counter-fiſſure*, where the ſkull is fractured and ſometimes depreſſed on the oppoſite ſide to, or at a diſtance from, the part where the injury was received. This is fortunately not a very frequent occurrence, and has even been doubted by ſome; but different inſtances of it have, beyond all queſtion, been found. If therefore the operation of the trepan has been performed, and no fracture is diſcovered, no extravaſation appears on the ſurface of the brain; and if blood-letting and other means uſually employed do not remove the ſymptoms of compreſſion, the operator is to ſearch for a fracture on ſome other part. The whole head ſhould again be examined with much accuracy; and, by preſſing deliberately but firmly over every part of it, if the ſmalleſt degree of ſenſibility remains, the patient will ſhew ſigns of pain, either by moans or by raiſing his hands, when preſſure is made over the fractured part. In this way, fractures have been frequently detected, which might otherwiſe have been concealed.

Having here conſidered every thing preparatory to the operation of the trepan, we ſhall point out the means beſt adapted for the removal or elevation of a depreſſed portion of the bone, by the uſe of that inſtrument, under the article Trepan. After the operation, the patient ſhould be placed in as eaſy a poſition, in bed, as poſſible, with his head and ſhoulders elevated a little more than ordinary. If the operation be attended with ſucceſs, he will ſoon begin to ſhew ſigns of increaſing ſenſibility, and the original bad ſymptoms will gradually diſappear. In this ſtate, he ought to be kept as quiet as poſſible; proper laxatives being occaſionally adminiſtered, and ſuch as may be leaſt of a nauſeating nature. His food ought to be ſimple and eaſy of digeſtion, and his drink of the moſt diluent kind. If he complain of the wound being uneaſy, an emollient poultice ſhould be immediately applied, and renewed three or four times in the twenty-four hours. By theſe means there will commonly be a free ſuppuration from the whole ſurface of the ſore.

Every time the wound is dreſſed, the purulent matter ought to be wiped off from it with a fine warm ſponge; and if any degree of ſloughineſs takes place on the dura mater or parts adjacent, it will then be completely ſeparated. Granulations will begin to form, which will continue to increaſe till the whole ariſe to a level with the ſurface of the cranium. The edges of the ſore are now to be dreſſed with ſome mild cerate, and the reſt of it covered with fine lint, kept gently preſſed on it by a night-cap properly ſecured. In this way the cure will go on favourably; luxuriance of granulations will commonly be prevented; the parts will cicatrize kindly; and as all the ſkin has been preſerved in making the firſt inciſion, the cicatrix will be but little obſerved.

But things do not always proceed in this favourable manner. Sometimes, in a few hours after the operation, the patient is ſeized with a kind of reſtleſſneſs, toſſing his arms, and endeavouring to move himſelf in bed, while the ſymptoms of a compreſſed brain remain nearly the ſame as formerly. In this caſe, eſpecially if the pulſe be quick and ſtrong, the patient ought to be bled freely, as there will be reaſon to ſuſpect ſome tendency to inflammation in the brain. Sometimes, though the trepan has been properly applied, the ſymptoms are not relieved, on account of extravaſated fluids collected internally under the dura mater, or between the pia mater and brain, or in the cavity of the ventricles. The danger in theſe caſes will be in proportion to the depth of the collection. Particular attention, therefore, ought always to be paid, to the ſtate of the dura mater after the perforation has been made. If blood be collected below the dura mater, this membrane will be found tenſe, dark coloured, elaſtic, and even livid; in which caſe, an opening becomes abſolutely neceſſary to diſcharge the extravaſated fluid. Gentle ſcratches are to be made with a ſcalpel, till a probe or directory can be introduced; upon which the membrane is to be ſufficiently divided in a longitudinal, or ſometimes even in a crucial, direction, till an outlet to the fluid be given.

After the dura mater has been cut in this manner, there is a poſſibility of the brain protruding at the opening; but the danger from this is not equal to that ariſing from effuſed fluids compreſſing the brain. A troubleſome appearance alſo now and then follows the operation of the trepan; namely, the excreſcences called *fungi* (ſee FUNGUS), formerly ſuppoſed to grow immediately from the ſurface of the brain, but which, in general, originate from the ſurface of the dura mater or cut edge of the bone granulating too luxuriantly. After the wound is cured, only a ſmall cicatrix will remain, and, in general, the parts will be nearly as firm as at firſt, but when much of the integuments hath been ſeparated or deſtroyed, as they are never regenerated, the bone will be left covered only by a thin cuticle, with ſome ſmall quantity of cellular ſubſtance. When this is the caſe, the patient uſually wears a piece of ſilver, copper, or tin, properly fitted and lined with flannel, to protect it from the cold and other external injuries.

This is the method now commonly practiſed in caſes of compreſſion: but it frequently happens, that inſtead of compreſſion, ſuch a degree of concuſſion takes place that no aſſiſtance from the trepan can be attended with any advantage; for the effects of concuſſion (ſee CONCUSSION) are totally different from thoſe of compreſſion, and therefore to be removed in a different manner. In Part III. of his Surgical and Phyſiological Eſſays, Mr. Abernethy ſays, the degree of preſſure which the brain can ſuſtain without great injury to the ſyſtem, probably may vary according to the diſpoſition of that organ to be affected by it, the ſuddenneſs of its application, and the direction in which it is made; and although it muſt be very difficult to obtain any preciſe knowledge on this ſubject, yet there is great reaſon to believe that the brain can bear more preſſure without injury to it, than was formerly ſuppoſed. The firſt of theſe circumſtances ſeems evident; for, in ſome perſons, a ſlight preſſure produces ſevere ſymptoms; whilſt in others a much greater degree is borne without inconvenience. Where a compreſſing cauſe does not, in the firſt inſtance, occaſion bad effects, if inflammation of the brain enſues, it ſeems then to act injuriouſly; which probably ariſes from the increaſed ſuſceptibility of the brain. We can rarely judge of the effects of preſſure when any part of the cranium is beaten in by a blow: for in that caſe the ſhock generally occaſions ſtupefaction. Internal hæmorrhages, perhaps, afford us the beſt criterion whereby to determine the effects of preſſure on the brain. A caſe (the ſeventh) which Mr. Abernethy relates, ſufficiently illuſtrates this remark, for it appears that a conſiderable hæmorrhage muſt have taken place before it deprived the patient of his faculties; ſince he walked home, undreſſed himſelf, and went to bed, after the trunk of the middle artery of the dura mater had been ruptured. In caſes of apoplexy, alſo, the hæmorrhage is generally very large, before it produces thoſe conſequences which deſtroy life.

Compreſſion of the brain will ſometimes ariſe from the luxuriant growth of a part of the inner table of the ſkull, or a ſmall projecting piece of bone, which may have advanced ſpontaneouſly; and it has now and then been diſcovered that epileptic fits aroſe from this cauſe. In apoplexy, the common cauſe of a compreſſion of the brain is effuſed blood or ſerum. When perſons have a palſy of the lower extremities from incurvation of the ſpine, the paralyſis ariſes from compreſſion made on ſome part of the ſpinal marrow by a diſeaſe of the vertebræ; and nothing can relieve a patient effectually in this caſe, unleſs the preſſure be removed by extending the ſpinal column mechanically. (See *Curvature of the* SPINE.)

A dangerous compreſſion may be produced in different parts of the body, by the exiſtence of tumours, by diſlocation of the joints, or by fractures, &c. See TUMOUR, DISLOCATION, and FRACTURE.

COMPRESSOR *Naris*, or *Narium*, in *Myology*, is a muſcle of the noſe, deſcribed alſo under the name of conſtrictor naſi. It ariſes from the root of the ala naſi, where its fibres are ſtrongly connected with the depreſſor labii ſuperioris et alæ naſi, and are alſo mixed with thoſe of the depreſſor alæ naſi. It aſcends on the dorſum of the noſe, and ſcatters its fibres between the ala and the oſſa naſi; they are partly joined with the fibres of the oppoſite muſcle, and partly connected with thoſe of the frontal portion of the fronto-occipitalis. By drawing down the moveable part of the alæ naſi, and bringing it to the ſeptum, it cloſes the aperture of the noſtrils: in this caſe the depreſſor alæ naſi muſt concur with it, in order to render the inferior part of the ala fixed. If this latter muſcle does not act at the ſame time, the compreſſor naris will elevate the lower portion of the ala, and thereby expand the noſtril. Cowper calls it elevator alæ naſi: Santorini and Winſlow, tranſverſalis naſi.

COMPRESSOR *proſtatæ*. It ſeems doubtful whether this ſhould be conſidered as a diſtinct muſcle, or only as a portion of the levator ani. It ariſes from the under ſurface of the arch of the pubis, and is loſt between the proſtate and rectum. It will therefore have the power of elevating or compreſſing the former part.

COMPRINT, a ſurreptitious printing of one bookſeller's copy by another perſon, for gain; which was contrary to common law, and is now, under certain limitations, reſtrained by ſtatute. See LITERARY *Property*.

COMPRISE NIENT. See NIENT.

COMPROMISE, a treaty or contract, whereby two contending parties eſtabliſh one or more arbitrators, to judge of and terminate their differences in an amicable way.

The regular way of appointing a compromiſe is by a writing, expreſſing the names of the arbitrators, the power of chooſing an umpire, or ſuper-arbitrator, in caſe of need, a time limited for the arbitrage, and a penalty on the party who does not abide by the deciſion.

By the civil law, a ſlave cannot make a compromiſe without the leave of his maſter, nor can a pupil without the authority of his guardian, or a wife without that of her huſband. So a ſlave, a deaf or dumb man, a minor, and the perſon who is a party in the cauſe, are incapable of being choſen arbitrators in a compromiſe.

The occaſions on which a compromiſe is not allowed of, are reſtitutions, marriage-cauſes, criminal affairs, queſtions of ſtate; and, generally, any thing wherein the public intereſt is more concerned than that of private perſons.

In our law, a compromiſe is not of ſo much extent. Weſt defines it the faculty, or power of pronouncing ſentence between perſons at controverſy, given to arbitrators by the mutual private conſent of the parties, without public authority.

Matters compromiſed are alſo matters of law referred, or made an end of. See Arbiter and Arbitration.

Compromise is alſo uſed in beneficiary matters; where it ſignifies an act, whereby thoſe who have the right of election, transfer it to one or more perſons, to elect a perſon capable of the office or dignity.

COMPS, in *Geography*, a ſmall town of France, in the department of the Var, and chief place of a canton in the diſtrict of Draguignan; ten miles N. of Draguignan. It contains 739 and the canton 2949 inhabitants. The territory includes 325 kiliometres and 9 communes.

COMPSA, Conza, in *Ancient Geography*, a town of Italy, in Samnium, towards the ſouth-eaſt, upon the Aufidus. At the ſiege of this city was killed Milo, ſo well known by Cicero's oration on occaſion of his murder of Clodius. See Compza.

COMPSATUS, a river of Thrace, mentioned by Herodotus, which ran from north to ſouth, and diſcharged itſelf into the lake Biſtonis, near Abdera.

COMPTE, Lewis le, in *Biography*, a native of Bourdeaux, and of the order of jeſuits, went to China in the character of miſſionary in the year 1685. Upon his return, he publiſhed "Memoirs on the preſent State of China," &c., in two vols. As an hiſtorian he has been accuſed of a too great partiality for the character and manners of the Chineſe, and of attributing to them earlier advances in civilization and improvement than he was warranted by real facts. His work was proſcribed, and condemned to the flames, as the beſt means of refuting his opinions. He died at his native place in the year 1729. Nouv. Dict. Hiſt.

COMPTE, Nicholas de, a French monk, a native of Paris, is known as the author or editor of different works which have met with a favourable reception. Among others, he publiſhed "The remarkable Travels of Peter della Valle, a Roman Gentleman, tranſlated from the Italian, in 4 vols. 4to."—"A new and intereſting Hiſtory of the Kingdoms of Tonquin and Laos, in 4to." tranſlated from the Italian of father Manni, in 1666. In the year preceding this, he publiſhed the third volume of father Lewis Coulon's "Hiſtory of the Jews." He died at Paris in 1689.

COMPTING, or Counting-house, an office in the king's houſhold, under the direction of the lord ſteward, ſo called, becauſe the accompts for all expences of the king's houſhold are there taken daily by the lord ſteward, comptroller, cofferer, maſter of the houſhold, the clerks of the green-cloth, and the clerks comptrollers. They alſo there make proviſion for the houſhold, and make payments, and orders, for the good government thereof.

In the compting-houſe is the board of green-cloth.

COMPTON, Henry, in *Biography*, an eminent Engliſh biſhop, was the youngeſt ſon of Spencer, the ſecond earl of Northampton. He was born in the year 1632, and, though deprived of his father by death at a very early age, was initiated with great care in the rudiments of learning, after which he was entered at Queen's college, Oxford, where he proſecuted his ſtudies with much diligence, till the year 1652. From the univerſity he went to the continent, with a view of perfecting himſelf in the modern languages, and of acquiring an accurate knowledge of foreign eſtabliſhments, eccleſiaſtical and civil. On his return, he accepted under Charles II. a cornet's commiſſion in the king's horſe guards, which he ſoon reſigned and devoted himſelf to the ſervice of the church. He was immediately admitted to the degree of maſter of arts in the univerſity of Cambridge, and afterwards obtained the grant of the next vacant canonry of Chriſt-church, Oxford. In 1666, he was admitted canon-commoner of that college, and ſhortly after was in poſſeſſion of the rectory of Cottenham in Cambridgeſhire. He was in the following year made maſter of St. Croſſe's hoſpital near Wincheſter, and in 1669 inſtalled canon of Chriſt-church. Without farther delay he took the degrees firſt of bachelor of divinity, and then of doctor of divinity. In 1674 he was nominated to the biſhopric of Oxford, where he remained but a ſingle year, when he was appointed dean of the royal chapel, and tranſlated to the ſee of London. For theſe valuable and highly important preferments, Dr. Compton was indebted as well to his own excellent character as to his family connections. Soon after he had been made biſhop of London, he was ſworn in of his majeſty's privy council, and undertook the ſuperintendency of the religious education of the princeſſes Mary and Anne. To the conſcientious diſcharge of his duty as a preceptor may be juſtly aſcribed the zealous attachment of his pupils, afterwards ſovereigns of England, to the Proteſtant religion, as by law eſtabliſhed. This worthy prelate endeavoured to deviſe methods of reconciling the diſſenters to his own church; his intentions were unqueſtionably good, but ſome of the means which he uſed to effect his purpoſe could not be juſtified on the principles of proteſtantiſm. Under the pretence of guarding the church from hereſy, he obtained a royal mandate to prohibit certain diſcuſſions on the doctrine of the Trinity: he nevertheleſs ſhewed himſelf a decided friend to the Proteſtant reformation, and encouraged his clergy to defend it with Chriſtian zeal, when the principles of popery, or a moſt blameable indifference to all religion, were encouraged by the profligate court of Charles II. His conduct, in this reſpect, which cannot be too highly applauded, rendered him obnoxious to the king and to his brother, who ſoon after aſcended the throne as James II. The name of the excellent prelate was immediately after this event ſtruck out of the liſt of the privy council, after which he was deprived of his office as dean of the royal chapel. For refuſing to become an inſtrument of eccleſiaſtical tyranny among his own clergy, and to ſanction various unconſtitutional meaſures of the king, he was, in 1686, ſuſpended from his epiſcopal office. In 1688 the dread of a revolution in favour of the prince of Orange, induced the king to attempt regaining the affection of Dr. Compton, and that of the other clergy, who had been ſimilarly treated, by reſtoring them to their office. It was, however, too late to effect a reconciliation, and the biſhop ſhortly after took a decided part in favour of the new order of things. He joined in conducting the princeſs Anne of Denmark from London to Nottingham; in ſigning the aſſociation begun at Exeter, and in waiting on the prince of Orange at the head of his clergy, to thank him for his interference in preſerving the laws and liberties of the nation; and in the houſe of peers he voted for the prince and princeſs of Orange in the room of the abdicated king. Immediately after this event had been determined on, he was reſtored to the office of privy counſellor, and to that of dean of the royal chapel; he had alſo the honour of performing the ceremony at the coronation of king William and queen Mary, inſtead of archbiſhop Sancroft, who refuſed to take the oaths to the new government. In the year 1689 he was appointed one of the commiſſioners for reviewing the liturgy, and preſident of the convocation, in which certain propoſed amendments were to be diſcuſſed. In this ſituation he at firſt joined the moderate party, who were for comprehending diſſenters by adapting the liturgy to their minds, but afterwards he united himſelf with thoſe members who adviſed and obtained the diſcontinuance of the convocation ſeſſion. Dr. Compton was appointed, as biſhop of London, a commiſſioner of trade and plantations, and in this capacity he ſelected and ſent over to the colonies in America, ſuch clergymen as he thought beſt adapted, by their talents and zeal, to promote the intereſts of the church of England. In the year 1690, he attended the king, at his own expence, to the congreſs at the Hague, where the grand alliance againſt France was concluded. From this period he united himſelf more cloſely with the tory party, in conſequence of which his influence at the court of king William was greatly diminiſhed, if not wholly terminated; but in the reign of queen Anne, he recovered his former power and intereſt. Dr. Compton was in the commiſſion for promoting the union of Scotland with England; he was aſſiduous in obtaining the act for augmenting ſmall livings, by a grant of the firſt fruits and tenths; and he maintained a friendly correſpondence with the foreign Proteſtant churches, and the univerſity of Geneva, with a view of impreſſing them with favourable ſentiments towards the Church of England, and of obtaining their diſapprobation of thoſe who ſhould diſſent from its diſcipline. He died at Fulham in the year 1713, in the eighty-firſt year of his age. For ſome time before his deceaſe he is repreſented to have been much in the power of others, and to have followed their will rather than the dictates of his own mind. Through the whole of a long life he was exemplary in his moral conduct, and diſplayed the manners of a gentleman. He was a warm friend, a generous patron, and truly charitable to the wants of thoſe about him. As a biſhop he maintained the intereſts of the church, and was attentive to the conduct and advancement of his clergy, but as a preacher he was extremely dull and inanimate. His character as a literary man was reſpectable, though his works are not numerous nor of the firſt rank in merit. He publiſhed a tranſlation from the Italian of "The Life of Donna Olympia Maldachini, who governed the church during the time of Innocent X." "The Jeſuits' Intrigues with private Inſtructions of that Society to their Emiſſaries," tranſlated from the French. "A Treatiſe of the Holy Communion," and letters to the clergy at different periods, which were reprinted in 1686, under the title of "Epiſcopalia, or Letters of the Right Reverend Father in God, Henry Lord Biſhop of London, to the Clergy, &c." He alſo publiſhed "A Letter on Non-reſiſtance," which may be ſeen in memoirs of Mr. John Kettlewell. Biog. Brit. Tindal's Continuation of Rapin, vol. vi. &c.

Compton, *Little*, in *Geography*, a town of the United States of America, in Rhode iſland.

COMPTONIA, in *Botany*, (ſo named by Dr. Solander, in honour of the right reverend Henry Compton, lord biſhop of London, who cultivated many exotics at Fulham.) L'Herit. Stirp. Nov. Schreb. 1764. Willd. 1644. Gært. 564. Claſs and order, *monœcia triandria*. Nat. Ord. *Amentaceæ*.

Gen. Ch. *Male flowers*. *Catkin* cylindrical; looſely imbricated all round with concave, kidney-ſhaped, acuminate, caducous, one-flowered ſcales. *Cal.* Perianth two-leaved; leaves equal, boat-ſhaped, ſhorter than the ſcale. *Cor.* none. *Stam.* Filaments three, ſhorter than the calyx, forked; anthers ſix, two-valved. *Female flowers*. *Catkin* egg-ſhaped, cloſely imbricated with ſcales ſimilar to thoſe of the male. *Cal.* Perianth ſix-leaved; leaves oppoſite, in pairs, filiform, membranous at the baſe, many times longer than the ſcale. *Cor.* none. *Piſt.* Germ roundiſh; ſtyles two, capillary. *Peric.* none. *Seed.* Nut oval, one-celled, without valves.

Eſſ. Ch. Male flowers in a catkin. Calyx two-leaved. Corolla none. Anthers forked. Female flowers in a catkin. Calyx ſix-leaved. Corolla none. Styles two. Nut oval.

Sp. C. *aſplenifolia*. Hort. Kew. 3. 334. Mart. Willd. Gært. tab. 90. fig. 7. (Liquidambar aſplenifolium; Linn. Sp. Pl. Myrica. Linn. Hort. Clif. Gale mariana. Pet. Muſ. 773. Myrti brabanticæ affinis americana; Pluk. alm. 250. tab. 100. fig. 6, 7.) *Stems* near three feet high, ſhrubby, ſlender, hairy, branched. *Leaves* from three to four inches long, half an inch broad, alternately ſinuated almoſt to the midrib, reſembling thoſe of ſpleenwort, dark green, hairy underneath, ſitting cloſe to the ſtalks. *Male catkins* lateral, erect. *Nut* oſſeous, turgidly lenticular, naked, ſmooth, ſhining, obſoletely ſtriated, of a bay colour. A native of New York, Pennſylvania, Virginia, and Carolina; cultivated by the dutcheſs of Beaufort in 1714; flowering from March to May. Boſc was well acquainted with it in Carolina, and obſerved, that the branches generally died at the end of the third year, the new wood then ſucceeding to the old, as in the rubi; it was alſo ſeldom found in fruit, though it flowered abundantly.

COMPTROL, or Controle, is properly, a double regiſter, kept of acts, iſſues, &c. of the officers or commiſſioners in the revenue, army, &c. in order to perceive the true ſtate thereof, and to certify the truth, and the due keeping of the acts ſubject to that enregiſterment. See Register.

COMPTROLLER, an officer eſtabliſhed to comptrol, or over-ſee public accounts, and to certify, on occaſion, whether things have been comptrolled and examined, or not. Thus, we have a *comptroller of the king's houſhold*, or of the accounts of the board of green-cloth: *Comptroller-general* of the cuſtoms; *comptroller* of the navy; *comptroller* of the mint; *comptroller* of the exciſe; *comptrollers* of the accounts of the army; of the chamber, &c. See Clerk.

Comptroller *of the Artillery*, is the perſon who inſpects the artillery-muſters, makes out the pay liſts, takes the accounts of ſtores and the remains of them, and is accountable to the office of ordnance.

Comptroller is alſo the name of an officer, who ſuperintends, examines, and inſpects the accounts of the army at large.

Comptroller *of the hanaper*, is an officer in chancery, attending the lord chancellor daily in term and ſeal time. This officer is to take all things ſealed from the clerk of the hanaper, incloſed in bags of leather, and to note the juſt number and effect thereof; to enter them in a book, with all the duties belonging to the king and other officers for the ſame, and ſo charge the clerk of the hanaper with them. See Clerk and Hanaper.

Comptrollers *of the pells*, are officers of the exchequer, whereof there are two, *viz.* two chamberlains clerks, who keep a comptrol of the pell of receipts, and goings-out; originally they took notes of other officers' accompts, in order to diſcover if they did amiſs.

Comptroller *of the pipe*, an officer of the exchequer, who writes out ſummonſes twice a year, to levy the farms and debts of the pipe. See Exchequer and Pipe.

He was anciently called *duplex ingroſſator*.

Comptroller's *bay*, in *Geography*, a bay of the Pacific ocean in the N.W. part of America, ſituated to the north of Cape Suckling, and of an iſland, ſtretching S. E. and N.W. about 3 leagues, and lying on the N.W. ſide of the N. E. end of Kaye's iſland. N. lat. 60° 6'. W. long. about 215° 30'.

COMPULSION, and *inevitable Neceſſity*, in *Law*, conſtitute a ſpecies of defect of will, and they denote ſuch a conſtraint upon the will, by which a man is urged to do that which his judgment diſapproves; and which, it is to be preſumed, his will (if left to itſelf) would reject. As puniſhments are only inflicted for the abuſe of that free will, which God has given to man, it is highly juſt and equitable that a man ſhould be excuſed for thoſe acts, which are done through unavoidable force and compulſion. Of this nature is the obligation of *civil* ſubjection, whereby the inferior is conſtrained by the ſuperior to act in a manner contrary to what his own reaſon and inclination would ſuggeſt; as when a legiſlator eſtabliſhes iniquity by a law, and commands the ſubject to do an act contrary to religion or ſound morality. How far the excuſe will be admitted "in foro conſcientiæ," or whether the inferior in this caſe is not bound to obey the divine rather than the human law is a queſtion, which admits of no doubt. Nevertheleſs, obedience to exiſting laws is unqueſtionably a ſufficient extenuation of civil guilt before the municipal tribunal. The ſheriff, who burnt Latimer and Ridley, in the bigotted days of queen Mary, was not liable to puniſhment from Elizabeth, for executing ſo horrid an office; being juſtified by the commands of that magiſtracy, which endeavoured to reſtore ſuperſtition under the holy auſpices of its mercileſs ſiſter, perſecution. As to perſons in private relations, the principal caſe where conſtraint of a ſuperior is allowed as an excuſe for criminal miſconduct, is with regard to the matrimonial ſubjection of the wife to her huſband; for neither a ſon nor a ſervant is excuſed for the commiſſion of any crime, whether capital or otherwiſe, by the command or coërcion of the parent or maſter; (1 Hawk. P. C. 3.) though in ſome caſes the command or authority of the huſband, either expreſs or implied, will privilege the wife from puniſhment, even for capital offences. And, therefore, if a woman commit theft, burglary, or other civil offences againſt the laws of ſociety, by the coërcion of her huſband; or even in his company, which the law conſtrues a coërcion; ſhe is not guilty of any crime; being conſidered as acting by compulſion, and not of her own will. (1 Hal. P. C. 45.) This doctrine is at leaſt a thouſand years old in this kingdom, being found among the laws of king Ina the Weſt-Saxon. (cap. 57.) This rule, however, with regard to crimes, admits of an exception in crimes that are "mala in ſe," and prohibited by the law of nature, as murder and the like. Alſo in treaſon, no plea of coverture ſhall excuſe the wife. In inferior miſdemeanors there is likewiſe an exception; for a wife may be indicted and ſet in the pillory with her huſband, for keeping a *brothel*. And in all caſes where the wife offends alone, without the company or coërcion of her huſband, ſhe is reſponſible for her offence, as much as any feme-ſole. Another ſpecies of compulſion or neceſſity is what our law calls *dureſs per minas*; which ſee. A third ſpecies of neceſſity, diſtinguiſhable from the actual compulſion of external force or fear, is, when a man has his choice of two evils ſet before him, and being under a neceſſity of chooſing one, he chuſes the leaſt pernicious of the two. Of this ſort is that neceſſity, where a man by the commandment of the law is bound to arreſt another for any capital offence, or to diſperſe a riot, and reſiſtance is made to his authority; it is in this caſe juſtifiable and even neceſſary to beat, to wound, or perhaps to kill the offenders, rather than permit the murderer to eſcape, or the riot to continue. 1 Hal. P. C. 53. There is another caſe of neceſſity, which has occaſioned much ſpeculation among the writers upon general law; *viz.* whether a man in extreme want of food or cloathing may juſtify ſtealing either, to relieve his preſent neceſſities. Grotius and Puffendorf, and many other of the foreign juriſts, maintain the affirmative; alleging that in ſuch caſes the community of goods by a kind of tacit conceſſion of ſociety is revived. Some of our own lawyers have held the ſame opinion (See Britton, c. 10. Mirr. c. 4. § 16.); though it ſeems to be an unwarranted doctrine, borrowed from the notions of ſome civilians: at leaſt, it is now antiquated; the law of England admitting no ſuch excuſe at preſent. 1 Hal. P. C. 54. However, the founders of our conſtitution have thought it better to veſt in the crown the power of pardoning particular objects of compaſſion than to countenance and eſtabliſh theft by one general undiſtinguiſhing law. Blackſt. Com. vol. iv.

COMPULSOR, formed of the verb *compellere, to oblige, conſtrain*, an officer under the Roman emperors, diſpatched from court into the provinces, to compel the payment of taxes, &c. not paid within the time preſcribed.

Theſe were charged with ſo many exactions, under colour of their office, that Honorius caſhiered them by a law in 412.

The laws of the Viſigoths mention military compulſors; who were officers among the Goths, whoſe buſineſs was to oblige the tardy ſoldiers to go into the fight, or to run to an attack, &c.

Caſſian mentions a kind of monaſtic compulſors, whoſe buſineſs was to declare the hours of canonical office, and to take care the monks went to church at thoſe hours.

COMPULTERIA, in *Ancient Geography*, a town of Italy, in Campania. It abandoned the Romans to ſurrender itſelf to Hannibal; but Fabius reſtored it by the ſword.

COMPUNCTION, formed from *compungere*, of *pungere, to prick*, in *Theology*, an inward grief in the mind for having offended God.

The Romaniſts own their confeſſion inſignificant, unleſs attended with compunction, or pricking of heart. See CONFESSION.

Among ſpiritualiſts, compunction bears a more extenſive ſignification; and implies not only a grief for having offended God, but alſo a pious ſenſation of grief, ſorrow, and diſpleaſure, on other motives. Thus, the miſeries of life, the danger of being loſt in the world, the blindneſs of the wicked, &c. are to pious people motives of compunction.

COMPURGATOR, in *Law*, one that by oath juſtifies, or clears, another's innocence. They were introduced as evidence in the juriſprudence of the middle ages, and their number varied according to the importance of the ſubject in diſpute, or the nature of the crime with which a perſon was charged. In ſome caſes theſe compurgators were multiplied to the number of three hundred. (Præf. Nicol. ad Wilkins, p. 11.). But the uſual number was eleven. It has, indeed, been held by later authorities, that fewer than eleven compurgators will anſwer the purpoſe; but ſir Edward Coke is poſitive that there muſt be this number; and his opinion is founded both on better authority and on better reaſon, for as wager of law is equivalent to a verdict in the defendant's favour, it ought to be eſtabliſhed by the ſame or equal teſtimony, namely, by the oath of twelve men. Thus Glanvil expreſſes it (l. 1. c. 9.) "jurabit duodecima manu;" and in 9 Hen. III. when a defendant in an action of debt waged his law, it was adjudged by the court "quod defendat ſe duodecima manu." Thus too, in an author of the age of Edward I., we read, "adjudicabitur reus et legem ſuam duodecima manu." And the ancient treatiſe, entitled, "Dyverſite des courts," expreſsly confirms ſir Edward Coke's opinion.

This device, which was adopted for rendering the purgation by oath more certain and ſatisfactory, was found to be ineffectual. It was a point of honour with every man in Europe, during ſeveral ages, not to deſert the chief on whom he depended, and to ſtand by thoſe with whom the ties of blood connected him. Whoever then was bold enough to violate the laws, was ſure of devoted adherents, willing to abet and eager to ſcreen him in whatever manner he required. The formality of calling compurgators proved an apparent, not a real ſecurity, againſt falſehood and perjury; and the ſentences of courts, while they continued to refer every point in queſtion to the oath of the defendant, became ſo flagrantly iniquitous as to excite univerſal indignation againſt this method of prevention. See Oath and Wager *of Law*.

COMPUTATION, the manner of accounting and eſtimating time, weights, meaſures, and money.

The word is ſometimes alſo uſed among mathematicians in the like ſenſe as Calculation.

Computation *of a planet's motion*. See Planet.

Computation is particularly uſed in *Law* in reſpect of the true account, or conſtruction of time, ſo underſtood, as that neither party do wrong to the other, nor the determination of time be left at large, or be taken otherwiſe than according to the judgment and intention of law.

A deed, dated May 11, to hold from the day of the date, ſhall be conſtrued to begin on the 12th day of May.

If indentures of demiſe be ingroſſed, bearing date May 11, 1769, to have and to hold the land in S. for three years from henceforth; and the indentures be delivered the 4th of June following: in this caſe, *from henceforth* ſhall be computed from the day of the delivery, and not from the date. And if the indentures be delivered at four of the clock in the afternoon, the ſaid 4th of June, the leaſe ſhall end the third day of June in the third year; the law, in ſuch computation, rejecting all fractions or diviſions of the day, on account of that uncertainty which is the mother of contention. In writings, ordered by the ſtat. 27 Hen. VIII. to be inrolled within ſix months, if ſuch writings have date, the ſix months ſhall be accounted from the date, and not from the delivery: if they want date, it ſhall be accounted from the delivery. Coke, lib. 5.

If a deed be ſhewn to a court at Weſtminſter, it ſhall remain in court (by judgment of law) all the term in which it is ſhewn: for all the term is but as one day in law. Coke, ibid.—If a church be void, and the patron does not preſent within ſix months, the biſhop of the dioceſe may collate his chaplain; but theſe ſix months ſhall be computed according to 28 days of the month; and not according to the calendar.

Computation *of Miles*, after the Engliſh manner, allows 5280 feet, or 1760 yards to each mile; and the ſame ſhall be reckoned, not by ſtraight lines, as a bird or arrow may fly, but according to the neareſt and moſt uſual way. Cro. Eliz. 212.

COMPUTO, a writ thus called from its effect, which is to compel a bailiff, chamberlain, or receiver, to yield his accompts. It is founded on the ſtatute of W. & M. 2. c. 12.

The ſame lies for executors of executors; and againſt the guardian in ſocage, for waſte made in the minority of the heir.

Computo *vicecomitis habendo reſpectu*. See Respectu.

COMPZA, in *Ancient Geography*, a town of Italy, in the territory of the Hirpini, towards the frontiers of Lucania. Hannibal, after the battle of Cannæ, was invited into the country of the Hirpini by Statius, who promiſed to ſurrender to him the town of Compza. The modern name is Consa or Conza. See alſo Compsa.

COMRADE is a common appellation for a fellow-ſoldier in the ſame regiment, troop, or company.

COMSHE, in *Geography*. See Comche.

COMTAT Venaissin, a country ſituated in the ſouth of France, formerly belonging to the pope, by whom it was ceded, together with its chief city Avignon, to the French government, ſoon after the revolution of 1789. It now forms part of the department of Vaucluſe.

COMTE, Count. The titles of *comte*, of *duc*, of *vicaire*, of *centenier*, or *thungen* before the time of Charles the Bald, were not hereditary in families. Theſe officers adminiſtered the finances and juſtice in the provinces: they were, at the ſame time, magiſtrates and military characters; they convoked the *ban* and *arriere-ban*. They aſſembled and conducted the troops to the general rendezvous. And when they judged a cauſe they had their ſhields on.

Comte *du Palais*. See Majordome.

COMUM, in *Ancient Geography*, a town of Gallia Tranſpadana, ſituated towards the north, on the ſouthern bank of the lake Larius. It was founded by the Gauls, became a Roman colony, and was enlarged by Scipio. Julius Cæſar eſtabliſhed Greeks in it, and then called it the new Comum, but upon their departure it loſt this epithet. It was a municipal town. Pliny founded in it ſchools and a public library. See Como.

COMUS, in *Mythology*, the god of jollity or feſtivity. There is great reaſon to believe he was the Chamos of the Moabites; Baal-Phegor, Baal-Peor, Priapus, and Bacchus. He is repreſented under the appearance of a young man, with an inflamed red countenance, his head inclined, and crowned with flowers; his air drowſy; leaning on a huntſman's ſpear in his left hand, and holding an inverted torch in his right. His ſtatue was placed at the chamber doors of new married perſons; his pedeſtal crowned with flowers.

CON, *Ital.* a propoſition, placed before many muſical terms; as *Con ario*, with the bow, after a *pirricato*, which ſee. *Con ſordini*, with the ſordini or mute. *Con affetto*, tenderly. *Con furia*, furiouſly. *Con diſcrezione*, diſcreetly, as to rapidity. *Con violini*, with violins, &c.

CONADIPSAS, in *Ancient Geography*, an ancient town of Scythia, on the other ſide of Imaus.

CONAFADOS, an epiſcopal town of Arabia, under the metropolis of Boſtra.

CONAJOHARY, in *Geography*, a poſt town of America, on the ſouth ſide of Mohawk river, in the ſtate of New York, 36 miles above Schenectady, and 318 from Philadelphia.

CONAME, in *Botany*, the name given by Aublet to a genus formed by him for a ſhrub found in Cayenne, which has ſince been conſidered as a phyllanthes. He gives it the following character. Male and female flowers on different plants. *Calyx* ſix-cleft. *Cor.* none. *Stam.* numerous. *Piſt.* Germ ſtriated; ſtyle bifid; ſtigma villous. *Peric.* Capſule ſix-celled.

CONANA, in *Ancient Geography*, an epiſcopal town of Aſia, in Pamphylia.

CONANICUT, in *Geography*, an iſland near the coaſt of America, a little to the eaſt of Rhode iſland. N. lat. 41° 25'. W. long. 71° 20'.

CONANT, John, in *Biography*, was born at Yeatenton, Devon, in the year 1608. He was entered at Exeter college, Oxford, in 1626, where he acquired great reputation for his diligence and for his talents as an able diſputant. As a claſſical ſcholar he was remarkable for the purity of his Latin ſtyle, and for his intimate and extenſive acquaintance with the Greek language. He was alſo well verſed in the ſeveral oriental tongues. In 1633, he was choſen fellow of Exeter college, where his fame, as a tutor, procured him pupils from many very reſpectable families. The commencement of the civil wars obliged him to retire from the univerſity, and he officiated for ſome time at the living of Lymington, where he was plundered of his property, and impriſoned. As ſoon as he was liberated he went to London, and became domeſtic chaplain to lord Chandos. While he continued in his lordſhip's houſe at Hanfield in Middleſex, he preached a gratuitous lecture at Uxbridge on a week day to numerous audiences. On the 7th of June 1649, he was unanimouſly choſen rector of Exeter college, without any ſolicitation on his own part. Shortly after this he was in danger of being driven out of all public employment, by the parliament's requiring his ſubſcription to the "engagement," by which a promiſe was to be given to be true and faithful to the commonwealth of England, without a houſe of lords. This he at firſt declined; having however a fortnight given him to reconſider the matter, he ſubmitted; but under a declaration, ſubſcribed at the ſame time with the "engagement," which rendered that inſtrument almoſt nugatory. He now entered upon his office as rector with increaſed zeal, and diſcharged the ſeveral duties incumbent upon him, with the utmoſt diligence and fidelity. In December 1654, he was appointed divinity-profeſſor of the univerſity of Oxford, and in three years afterwards he was raiſed to the dignity of vice-chancellor of that univerſity, which he retained till Auguſt 5, 1660. While he held this high office, he was very inſtrumental in procuring Mr. Selden's valuable collection of books for the public library; he diſtinguiſhed himſelf by the correction of abuſes, and by the regulation of the public exerciſes in ſuch a manner, as proved highly beneficial to the intereſts of ſolid learning. By ſome of his biographers, Mr. Conant has been applauded for the ſhare which he took in defeating a project for erecting an univerſity in the county of Durham. Praiſe on this account to us ſeems very ill beſtowed, becauſe the intended object was worthy of a great nation, whoſe places of public inſtruction cannot be regarded as ſufficiently numerous, to ſuperſede the neceſſity of others in diſtant parts of the kingdom. Upon the reſtoration of Charles II. Dr. Conant, in his official capacity, came to London, attended by the proctors, and others, and being introduced to the king he made a Latin ſpeech on the occaſion, and preſented his majeſty with a book of verſes written by the members of the univerſity. He was appointed, in March 1661, a commiſſioner with others to review the book of common prayer, and he aſſiſted at the Savoy conferences. After this, upon the paſſing of the act of uniformity, he was deprived of his preferments, becauſe he refuſed to conform. During eight years he lived in retirement, when, upon ſerious deliberation on the nature and lawfulneſs of conformity, he reſolved to comply, and ſubmitted to a re-ordination by Reynolds, biſhop of Norwich, whoſe daughter he had married nearly twenty years before. Preferments were now immediately offered to his choice; and he accepted of the vicarage of All-Saints, Northampton, in which town he had for ſeveral years reſided, in the higheſt eſtimation of the moſt reſpectable inhabitants. In Sept. 1675, his church and the greater part of the pariſh were deſtroyed by fire; but his own houſe eſcaped. In the ſucceeding year the biſhop of Norwich offered him the archdeaconry, with this high compliment, "I do not expect thanks from you, but ſhall be very thankful to you, if you will accept of it." He conceded to this handſome requeſt, and diſcharged the office worthily, as long as his health would allow. In December 1681, he was inſtalled a prebendary in the church of Worceſter, at the requeſt of the earl of Radnor, who aſked for it of the king, ſaying he came to beg preferment for a very deſerving perſon, who never ſought any thing for himſelf. He had long laboured under a weakneſs of ſight, which terminated in total blindneſs in the year 1686. This heavy calamity, and the weight and infirmities of old age, he bore with exemplary reſignation to the divine will till his death, which happened March 12, 1693. He was interred in his own pariſh church of All-Saints in Northampton, where a handſome monument was erected to his memory. Dr. Conant was a man of ſolid and extenſive learning, but his great diffidence led him to conceal his acquirements. We have ſix volumes of his ſermons, of which one was dedicated by himſelf to the inhabitants of Northampton, the others were publiſhed after his death, by Dr. John Williams, afterwards biſhop of Chicheſter, and Mr. Coates principal of Magdalen-hall. Biog. Brit.

CONARIUM, in *Anatomy*, a term which has been applied to the pineal gland of the brain, in conſequence of its conical figure. See BRAIN.

CONATUS, *endeavour*, a term frequently uſed by philoſophical and mathematical writers; nearly equivalent to *niſus*. Conatus ſeems to be the ſame, with reſpect to motion, that a point is with reſpect to a line; at leaſt the two have this in common, that as the point is inceptive of the line, or the term from which it commences; ſo is the beginning of all motion called the *conatus*. Add, that as in mathematical demonſtrations, the extenſion of the point is conceived as if it were nothing at all; ſo, in the *conatus* of motion, there is no regard to the time wherein, or the length which, it advances. See *Laws of* NATURE.

Hence, ſome define conatus to be a quantity of motion not capable of being expreſſed by any time or length. Accordingly, all motion tends preciſely the ſame way wherein the moveable is acted on, or determined by the ſame moving power. See MOTION.

CONAWANGO, in *Geography*, a northern branch of Alleghany river, in Pennſylvania, which riſes from Chataughque lake.

CONCA, CAV. SEBASTIANO, in *Biography*, an hiſtorical painter of conſiderable reputation in the 18th century. He was born at Gaeta in the year 1676, and became the diſciple of F. Solemene, the moſt celebrated maſter of the ſchool of Naples at that period. At the age of forty, Conca eſtabliſhed himſelf at Rome, and ſpent five whole years in drawing from the fineſt productions of ancient and modern art, in the vain hope of uniting to the graceful facility he had acquired from his maſter, a greater purity and correctneſs of deſign. But it was too late; bred a manneriſt, he had inſenſibly imbibed thoſe maxims which were to decide his future character; and at length he had the good ſenſe to adopt the advice of the ſculptor Le Gros, by purſuing the track which had originally been pointed out to him. He ſoon became an able machiniſt *(pittore di macchina)*, in a ſtyle not very unlike that of Cortona. He united to facility of invention, and rapidity of pencil, a gay and faſcinating diſtribution of colour; but his fleſh has generally too green a hue in the ſhadows. Amongſt his large works at Rome, the "Aſſumption," at the church of St. Martino, and the "Prophet Jonas," at St. Giovanni Laterano, are of the beſt. Many of his other productions are at Loretto, Ancona, and other towns of the eccleſiaſtical ſtate, beſides an infinity of cabinet pictures diſperſed throughout all parts of Europe. This artiſt died in 1764. He had a brother, Giovanni Conca, who aſſiſted him in the execution of many of his large works, and is ſaid to have been an excellent copyiſt. Lanzi, Storia Pittorica.

CONCA, in *Geography*, a town of the iſland of Corſica, 12 miles N. of Porto Vecchio.—Alſo, a market town in a ſmall lake in the Campagna di Roma, in Italy.—Alſo, a ſmall

ſmall river of Italy, which has its ſource in the duchy of Urbino, and flows into the gulf of Venice.

Concale. See Cancale.

Concale *Bay*, in the channel, on the coaſt of the department of Ille and Vilaine in France, is a fine bay, in which the Engliſh effected a landing in June 1758, and whence they proceeded to the port of St. Malo, where they burnt above 100 veſſels of different ſizes.

CONCAMERATED, among *Builders*, an appellation given to ſuch roofs as are arched in the vaults.

CONCAMERATIO, was an arched room in our ancient churches, between the eaſt end of the church and the high altar; ſo formed, that in proceſſions they might ſurround it.

CONCAN, or Cockun, in *Geography*, a tract of country on the weſtern coaſt of Hindooſtan, ſituated between Bombay and Goa, and ſeparated from the reſt of the continent by a ridge of high mountains called the Gauts. When the Moguls ſeized on Hindooſtan, they found this coaſt infeſted with pirates, and fitted out a fleet to protect their veſſels. The Mahrattas, finding their piracies interrupted, armed againſt the Moguls, ravaged their poſſeſſions, and fitted out a fleet to protect their pirates. Conagy Angria, who by his courage had acquired the ſupreme command, was appointed governor of Severndroog, one of the beſt fortreſſes on the coaſt, where he formed an independent ſtate, and in a little time extended his dominions for the ſpace of 40 leagues along the coaſt, and ſix leagues wide towards the mountains. His ſucceſſors aſſumed the name of Angria, and made peace with the Mahrattas on paying an annual tribute. They continued to make depredations on the coaſt, and ſeize all veſſels that paſſed that way till the year 1756, when their fleet was deſtroyed, and the ſtrong fort of Gheriah, in which the chief reſided, was taken by admiral Watſon and colonel Clive. The country now belongs to the Mahrattas. The principal towns are Choul, Fort Victoria, Dabul, Severndroog, Gheriah, Tamana, and Sunderdoo.

CONCANA, in *Ancient Geography*, a town of Spain, towards the north-eaſt of Lucus Aſturum, and to the ſouth of Salia, near the ſea. Horace ſays, that the inhabitants of this city took pleaſure in drinking the blood of horſes: and although a change took place in the manners of the people in Spain under the dominion of the Romans, Silius Italicus, who wrote under Trajan, gives an account of them ſimilar to that of Horace.

CONCANGIUM, a Roman ſtation, under the government of the honourable the duke of Britain, not mentioned in the Itinerary, but recorded in the Notitia Imperii, and generally believed to have been ſituated at Watercrook, near Kendal, where are viſible remains of a Roman ſtation, and where Roman antiquities have been found.

CONCARNEAU, or Conquerneau, in *Geography*, a ſmall, but neat ſea-port town of France, in the department of Finiſtere, and chief place of a canton in the diſtrict of Quimper, 42 miles S.E. of Breſt. The place contains 2,200, and the canton 6,320 inhabitants; the territory includes 125 kiliometres, and 4 communes. Its principal and almoſt only trade, is in pilchards, of which the average annual ſhipment is 600 barrels. The price of a barrel varies from 150 to 300 livres. N. lat. 47° 55′. E. long. 3° 45′.

CONCATENATION, in *Philoſophy*, a connexion of things, in manner of a chain.

The concatenation of ſecond cauſes is an effect of Providence. See Cause.

CONCAVE is applied to the inner ſurface of a hollow body; particularly if it be circular.

Concave is particularly underſtood of mirrors and lenſes: concave lenſes are either concave on both ſides, called *concavo-concave*; or concave on one ſide, and plane on the other, called *plano-concave*; or concave on one ſide, and convex on the other, called *concavo convex*, or *convexo-concave*, as the one or the other ſurface is a portion of a leſs ſphere.

The property of all concave lenſes is, that the rays of light, in paſſing through them, are deflected, or made to recede from one another; as in convex lenſes they are inflected towards each other; and that the more, as the concavity and convexity pertain to leſs circles.

Hence, parallel rays, as thoſe from the ſun, by paſſing through a concave lens, become diverging; diverging rays are made to diverge the more, and converging rays are either made to converge leſs, or become parallel, or go out diverging.

Hence, objects viewed through concave lenſes appear diminiſhed; and the more ſo, as they are portions of leſs ſpheres; and this in oblique, as well as in direct rays. See Lens.

Concave mirrors have the contrary effect to lenſes: they reflect the rays which fall on them, ſo as to make them approach more to, or recede from, each other than before, according to the ſituation of the object; and that the more as the concavity is greater, or the ſpheres whereof they are ſegments, leſs.

Hence, concave mirrors magnify objects preſented to them; and that in a greater proportion, as they are portions of greater ſpheres. See Mirror.

Hence, alſo, concave mirrors have the effect of burning objects, when placed in their focus. See Burning-glass.

CONCAVITY. An arch of a curve has its concavity turned one way, when the right lines that join any two of its points are all on the ſame ſide of the arch.

Archimedes, intending to include ſuch lines as have rectilinear parts, in his definition, ſays, a line has its concavity turned one way, when the right lines that join any two of its points are either all upon one ſide of it, or while ſome fall upon the line itſelf, none fall upon the oppoſite ſide. Archim. de Sphær. and Cyl. Def. 2. Mac Laurin's Fluxions, art. 180.

When two lines, having their concavity turned the ſame way, have the ſame terms, and the one includes the other, or has its concavity towards it, the perimeter of that which includes, is greater than the perimeter of that which is included. Archim. ib. ax. 2.

CONCEALERS, in *Law*, ſuch as find out concealed lands, *i. e.* lands kept privily from the king, by common perſons, having nothing to ſhew for their title, or eſtate therein.

They are thus called *per antiphraſin, a concelando*; as *mons* is *a movendo*, &c. Lord Coke calls them *turbidum hominum genus*.

CONCEALMENT *of baſtard's death*. See Bastard.

Concealment *of Treaſon*. See Misprision.

CONCELHO de Anciaens, in *Geography*, a town of Portugal, in the province of Tra-los-Montes, 8 miles W.N.W. of Mirandela.

Concelho *de Jaes*, a town of Portugal, in the province of Tra-los-Montes, 10 miles W.S.W. of Mirandela.

CONCELLANA, a town of Naples, in the province of Baſilicata; 5 miles S. of Acerenza.

CONCENTEYNA, a town of Spain, in the province of Valencia; 25 miles N. of Alicant.

CONCENTRATION, in general, denotes the retiring, or withdrawing of a thing inwards, towards the centre, or middle.

External cold is ſaid to concentrate the heat within bodies: after meals, the natural warmth retires, and as it were concentrates to promote the digeſtion.

Concentration is alſo uſed by Dr. Grew for the higheſt degree of mixture, *viz.* that wherein two or more atoms or particles touch, by a reception, and intruſion of the one within the other. See Mixtion.

This he takes to be the caſe of all fixed bodies without taſte or ſmell; their conſtitution being ſo firm, that till the particles be detached from each other by ſome extraordinary means, they cannot affect thoſe ſenſes.

Concentration, in *Chemiſtry*, the act of increaſing the ſtrength of fluids, which are rendered ſtronger by abſtracting a portion of the mere menſtruum. This is generally effected by evaporation, where the menſtruum is driven off at a lower heat than is required to drive off the ſubſtance with which it is united. Thus, dilute ſulphuric acid may be conſidered as a mixture of the real acid with water, and by applying a certain heat, the water may be evaporized, leaving the acid behind in a ſtate of concentration. When concentrated as much as poſſible, its ſpecific gravity is about twice as great as that of water, but it can rarely be obtained denſer than 1,85. When concentrated to 2,000 it contains a conſiderable portion of water, as has been proved by combining it with barytes or potaſh, in which caſe water remains behind, and does not enter into the combination. Again, vinegar conſiſts of an acid and water, and brandy of alcohol and water, and in proportion as the acid and alcohol are freed from the water, they are ſaid to be more or leſs concentrated. This may be performed, 1. Either by ſimple diſtillation, in which caſe the acid or ſpirit comes over firſt, leaving the water behind; or, 2. By expoſing the vinegar or brandy to ſevere froſt, when the water will be frozen, and the acid or alcohol will be found in a ſtate of concentration in the middle of the ice; the greater the cold, the higher the ſtate of concentration; M. Lowitz has found, that the acid, however concentrated, congeals at—22°. Sulphuric acid, on the other hand, expoſed to a much leſs ſevere cold, cryſtallizes, and to effect this, it muſt not be greatly concentrated. 3. Another mode of concentrating the acetic acid, is by diſtilling acetate of copper, reduced to powder, in a retort; at firſt there comes over a liquid nearly colourleſs, and almoſt inſipid, and afterwards a highly concentrated acid tinged with green; but being diſtilled a ſecond time in a moderate heat, it is colourleſs, tranſparent, exceedingly pungent and concentrated. 4. The moſt perfect method of obtaining this acid in a concentrated ſtate, was diſcovered by M. Lowitz of Peterſburg; it is thus: diſtil a mixture of three parts of acetate of potaſh, and four parts of ſulphuric acid, till the acetic acid has come over into the receiver. To ſeparate it from the ſulphuric acid, with which it is ſlightly contaminated, it muſt be diſtilled over a portion of acetate of barytes. By the experiments of Adet, Darracq, and others, on concentrating the acetic and acetous acids, it is aſcertained that they differ only in concentration, each containing preciſely the ſame proportion of oxygen. Concentrated acetic acid is capable of an acceſs of oxygen, and in that ſtate it is called oxygenated acetic acid. Sulphuric and nitric acids, whether diluted or concentrated, are ſtill the ſame ſulphuric and nitric acids; but ſulphur*ic*, and ſulphur*ous*, or nitr*ic* and nitr*ous* acids, whatever be the ſtate of concentration, have different properties, and are of courſe ſpecifically different acids. Elem. de Chymie. Thompſon's Chemiſtry, Gren's Principles.

Concentration, in *Diſtillery*. Dr. Shaw, in his "Eſſay on the Diſtillery," is for introducing a method of concentrating the fermentable parts of vegetables from which their ſpirits are to be drawn by diſtillation; which, if it can be brought to be practiſed in the large way, will prove of very great uſe to the Britiſh diſtillery, as it will greatly ſhorten the diſtiller's buſineſs; which, at preſent, including the brewing, fermenting, &c. is much too long. He propoſes only to evaporate carefully the wort, or other tinctures or decoctions of vegetables made for the diſtilling of their ſpirits, to the conſiſtence of treacle: in this form they might be ſold to the diſtiller, who might keep them by him as long as he pleaſed, and occaſionally uſe them, by the eaſy method of reducing them into wort, by mixing warm water with them.

CONCENTRIC, in *Geometry* and *Aſtronomy*, ſomething that has the ſame common centre with another.

The word is principally uſed in ſpeaking of round bodies and figures, *viz.* circular, elliptical ones, &c. but may be likewiſe uſed for polygons, drawn parallel to each other, upon the ſame centre.

Concentric ſtands oppoſite to excentric.

To find the area of the ſpace included between the circumferences of two concentric circles; ſee Annulus.

Nonius's method of graduating inſtruments, conſiſts in deſcribing with the ſame quadrant 45 concentric arches, dividing the outermoſt into 90 equal parts, the next into 89, &c. See Nonius.

CONCENTRICITY *of the Strata*, in *Natural Hiſtory*. The idea has very generally prevailed among geologiſts and mineralogical writers, that the ſeveral layers of matter or ſtrata, which compoſe the ſurface of the earth we inhabit, were originally formed or depoſited in uniform and level beds, or concentric to the centre or maſs of the earth. Among theſe Mr. Whitehurſt, in his "Enquiry into the Original State and Formation of the Earth," 1ſt edit. p. 192, ſays, the ſtrata "obtained an uniform concentric arrangement, ſurrounding the centre of the earth, as ſo many ſhells may be ſuppoſed to ſurround an egg." And nearly ſimilar have been the opinions of a large portion of writers on this ſubject. Mr. Kirwan, "Geological Eſſays," p. 22, ſuppoſes, that the cryſtallization of ſtrata from the chaotic or polygenous fluid, in ſome caſes, began at the ſurface, as we ſee happen to ſome ſalts and to lime water under evaporation, and that thus extenſive ſtrata might have been formed and ſunk to the bottom, moſtly in an horizontal poſition, but often from accidental ruptures during their fall, in an oblique or nearly vertical poſition. Dr. Townſon, "Philoſophy of Mineralogy," p. 68, ſays, "we muſt not ſuppoſe that the ſtrata regularly ſurround the globe like the concentric circles of an onion; they are rather like the ſcales of a lily; rather *ſquamoſus* than *tunicatus*. Though, in general, they are of great extent when not broken and loſt, they are known to have a natural termination." In the "Philoſophical Tranſactions," No. 391, Mr. John Stracey gives a figure for explaining a ſuppoſition of his on this ſubject, *viz.* that the ſtrata were originally formed while in a ſoft ſtate, as ſo many wedges, each pointing to and terminating in the axis of the earth; and that by the diurnal revolution of the earth from weſt to eaſt, theſe became bent into ſpirals, each lapping round each other, for ſome diſtance, and then ending, in ſucceſſion.

Whimſical as this laſt idea muſt have appeared, when it was firſt publiſhed, now more than 80 years ago, we are ſomewhat ſurprized that it had not the effect of occaſioning ſubſequent geological obſervers to notice, more particularly, the endings of the ſtrata, and the remarkable prevalence of their dip towards the ſouth-eaſt, compared with thoſe in any other direction; eſpecially when practical miners muſt have ſo often mentioned the dip "towards the 10 o'clock ſun," as being the moſt common. Under the articles Coal, and Colliery, the writer of this has endeavoured to ſhew that the ſtrata of the Britiſh iſlands end in ſucceſſion in proceeding from the ſouth-eaſtern part of England towards the north-weſt; the general dip being towards the ſouth-eaſt or nearly ſo, except in immenſely diſlocated parts of the country, as the wealds of Suſſex, Kent, and Surry, the peak of Derbyſhire and Staffordſhire, &c. of which ſome further and curious particulars will be given under the articles Denudation, Elevation, and Endings *of Strata*. From all which, it is expected that it will be made evidently to appear, that the ſtrata were not originally concentric with the earth's centre, but that the ſame formed planes or zones, inclined eaſtward in a ſmall angle with the horizon, which were of amazing extent, and were perfectly regular in their poſition, before they experienced the rude and almoſt inconceivable violence, which broke and tore the earth in pieces, and left it in its preſent form.

CONCEPTACULUM, in *Botany*, was originally applied by Linnæus to that kind of ſeed-veſſel which he afterwards termed *folliculus*, and which conſiſts of one valve only, burſting longitudinally, as in the natural order of *aſclepiadeæ*. Gærtner uſes the term *conceptaculum* in a general and lax ſenſe for a ſeed-veſſel, nor is it at preſent technically applied to any particular kind of fruit.

CONCEPTION, in *Geography*, otherwiſe called *Penco*, a city of Chili, in South America, and capital of a juriſdiction or biſhopric, ſuffragan of the archbiſhop of Lima, and having a chapter, conſiſting of a biſhop, dean, archdeacon, and two prebendaries. The ancient city ſtood at the mouth of the river St. Pierre, E. of Talcaguana, on the S.W. ſhore of a beautiful bay, and on a ſmall declivity, having a little river running through it, in S. lat. 36° 43′ 15″, and in longitude from the meridian of Teneriff, according to Father Feuillée, 303° 18′ 30″. The houſes were built with mud or burnt bricks, and covered with tiles; the churches, and alſo the Franciſcan, Auguſtine, and Dominican convents, as well as thoſe belonging to the fathers of mercy, were ſmall and mean, but the college of the Jeſuits was conſtructed in a ſuperior ſtyle of architecture. This city was firſt founded by captain Pedro de Valdivia in the year 1550; but the powerful revolt of the Indians of Arauco and Tucapel, obliged its inhabitants to remove to Santiago. Pedro de Valdivia, its founder, was killed in this conteſt, and his ſucceſſor in the command ſhared the ſame fate. The inhabitants, however, petitioned the audience of Lima for leave to return to their original city; they were again either ſlain or diſpoſſeſſed by the Indians; but thoſe that ſurvived were afterwards reſtored to their former poſſeſſion, which they for ſome time continued to enjoy with apparent ſecurity. In 1603 a more general confederacy was formed againſt the city, by which it was almoſt wholly deſtroyed; but receiving freſh ſuccours, it was again repaired. Subject, however, to dreadful earthquakes, and conſiſting of buildings ill adapted for permanent duration; it was totally deſtroyed by an earthquake in 1751 and nothing but its ruins are now viſible on the ſpot where it once ſtood. After the deſtruction of this town, which, during the earthquake, was ſwallowed up rather by the ſea than by the land, the inhabitants diſperſed and encamped in the environs. In 1763 they ſelected another ſpot, ſituated about a quarter of a league from the river Biobio, and three leagues from the ancient town of Conception, and the village of Talcaguana. On this ſpot they erected a new town, to which the biſhopric, the cathedral, and the religious houſes were transferred. The houſes conſiſt only of one ſtory, that they may be able more effectually to reſiſt the ſhock of earthquakes, which occur in thoſe parts almoſt evey year. This town occupies a large extent of ground. The inhabitants are about 10,000; and here is the reſidence of the biſhop and a colonel of horſe, who is the military governor. The biſhopric is nominally bounded on the north by that of Santiago, the capital of Chili, where the governor-general reſides, and on the eaſt by the Cordilleras, and extending on the ſouth as far as the ſtraits of Magellan. But its true limit is the river Biobio, about a quarter of a league from the town. M. de la Perouſe ſays of this part of Chili, that it is the moſt fertile ſpot in the world. Corn, he ſays, produces ſixty-fold, and the vine is equally abundant; the fields are covered with innumerable flocks, which, without requiring any care, multiply beyond all calculation. The only care neceſſary is to keep ſeparate the different property of individuals; and oxen, horſes, mules, and ſheep herd together in the ſame paſtures. A large ox is commonly worth eight dollars, a ſheep ¾ of a dollar; but there are no purchaſers, ſo that the inhabitants kill every year a great quantity of cattle, the ſkins and tallow of which are ſent to Lima. They alſo cure ſome proviſions for the conſumption of the ſmall coaſting veſſels which navigate the ſouth ſeas. The climate is remarkably healthy, and M. Pérouſe found ſeveral in this town that had completed 100 years; but notwithſtanding all theſe advantages, the colony is not thriving, which he attributes principally to the prohibitory regulations that extend through every part of Chili. This kingdom, he ſays, of which the productions, increaſed to their maximum, would ſupply all Europe; whoſe wool would be ſufficient for the manufacture of France and England, and whoſe herds, converted into ſalt proviſion, would produce a vaſt revenue; has no commerce. Four or five ſmall veſſels bring every year from Lima tobacco, ſugar, and ſome articles of European manufacture, which the miſerable inhabitants receive after having been charged with heavy cuſtoms at Cadiz, at Lima, and, laſtly, at their arrival at Chili; in exchange for which they give their tallow, hides, ſome deals, and their wheat, which, however, bears ſo low a price, that the cultivator has no inducement to extend his tillage. Unfortunately, ſays Pérouſe, for this country, it produces a ſmall quantity of gold; the annual amount of which in the dioceſe of Conception is eſtimated at about 200,000 piaſtres. The adminiſtration of juſtice is very defective. To theſe ſeveral circumſtances it is owing that the land remains uncleared, that commerce is in a low ſtate, that the houſes of the moſt opulent inhabitants of La Conception are almoſt deſtitute of furniture, and that the only workmen in the town are foreigners. The dreſs of the women conſiſts of a plaited petticoat, diſcovering half the leg, formed of gold and ſilver ſtuffs, which, being reſerved for extraordinary occaſions, is transferred, like jewels, from grand-mother to grand-daughter, ſtriped ſtockings of red, blue, and white, and very ſhort ſhoes, but ſuch ornaments are only within the reach of a few; the reſt having ſcarcely clothes to cover their nakedneſs. The idleneſs, together with the credulity and ſuperſtition of the inhabitants, has filled this kingdom with convents, both for men and women. The common people are a mongrel race, much addicted to theft, and the women are very eaſy of acceſs. Nevertheleſs, thoſe of a ſuperior claſs, or the true Spaniards, are extremely polite, and hoſpitable. The inhabitants, and even the women, excel in horſemanſhip; they are very dextrous in managing the lance and nooſe; and they rarely miſs their aim, though at full ſpeed, with the nooſe, which they throw 40 or 50 yards, and thus halter the object of their diverſion or revenge. The nooſe is made of thongs of cow-hides, which they twiſt with oil, till it is rendered ſupple and pliant, and ſo ſtrong ,as to hold, it is ſaid, a wild bull which would break a halter of hemp of double thickneſs. De Ulloa's, &c. Voyage to South America, vol. i. Perouſe's Voyage round the World, vol. i.

Conception, *the bay of,* is one of the moſt commodious that can be found in any part of the world. The length from Terra-firma, N. and S. is nearly 3½ leagues, and its breadth from E. to W. almoſt 3 leagues, which is contracted by the iſland of Quiriquina, forming two entrances; of theſe, that on the eaſt ſide is the ſafeſt, being two miles broad, and accordingly frequented by moſt ſhips. The weſt entrance is between the iſland and Talcaguana point, and is near half a league in breadth. In the principal entrance of this bay is 30 fathom water, which depth afterwards decreaſes to 11 and 10, till within about a mile of the ſhore, oppoſite to the entrance. The weſtern entrance, though the numerous rocks and breakers in it make it to appear very dangerous, has a channel with water ſufficient for the largeſt ſhip, the depth being at firſt 30 fathom, and never leſs than eleven. Within the bay are three roads or harbours, where ſhips anchor; for though the bottom be every where clear, it is only in one of theſe three places that ſhips can ride in ſafety, being no where elſe ſheltered from the wind. The firſt, called Puerto Tome, lies eaſt and weſt, with the north point of Quiriquina, contiguous to the coaſt of Terra-firma. The anchoring place is about half a league diſtant from the land; in about 12 fathom water. But this road is uſed only when the ſhips come in during the night; it being difficult to reach either of the other two before day-light, as ſeveral tacks muſt be made for that purpoſe. In this bay the principal port is that of Talcaguana. It is properly an elbow, and bears S. S.W. from the ſouth point of Quiriquina. This is much the moſt frequented, ſhips in general anchoring here, as it has not only better ground than any other part of the bay, but is moſt ſheltered from the north winds. Whereas at Cirillo Verde, a little green mountain, ſituated near the city, they lie expoſed not only to theſe winds, but alſo to the ſouth winds; the land which ſhould intercept them being low. Beſides, the bottom is of a looſe mud, ſo that the anchors in a hard gale of wind generally come home; and conſequently the ſhips are in great danger of being ſtranded on the coaſt. From theſe inconveniences it may be concluded, that the only ſhips which anchor here are ſuch as happen to be in theſe parts in the midſt of ſummer, for which this road is moſt convenient, as it is neareſt to the city. Although the tide riſes in this bay ſix feet three inches, the water is ſmooth, and there is ſcarcely any current. It is high water here at the full and change of the moon, at 45 minutes paſt one. The bay is open only to the north winds, which never blow but in the winter, that is, from the end of May to October. Two rivers empty themſelves into this bay; one of which paſſing through the city of Conception bears its name; the other is called St. Pedro. The firſt is the watering place for ſhips anchoring at Cirillo Verde; whereas thoſe at Talcaguana ſupply themſelves from ſtreams that flow from the adjacent eminences; they eaſily take on board a ſufficient quantity of wood, of which there is plenty, and alſo of all other neceſſaries. Ships, before they enter the bay of Conception, endeavour to make the iſland of Santa Maria, and then coaſt along it keeping at the ſame time a good look out for a reef of rocks which ſtretches out almoſt three leagues from the north-weſt point; thence they continue their courſe, keeping at a little diſtance from the main, there being no rocks beſides thoſe that are above the water. After weathering the rocks on the iſland of Santa Maria, they ſteer directly for Talcaguana point, at the diſtance of about half a league; from which ſea-ward is a rock called Quiebra-ollas, which ſhould be carefully avoided, as it is ſurrounded with ſhoals. After being abreaſt of this rock, they ſteer for the north point of Quiriquina; off which lie two rocks ſwarming with ſea-wolves; but as there is a ſufficient depth of water all round them, there is no other danger in ſtanding near them beſides that which is viſible. After paſſing them, the courſe is continued as near as poſſible to the iſland of Quiriquina, care being taken to avoid ſome other rocks lying along the ſhore. In making ſeveral tacks to get into Conception-bay, the iſland of Quiriquina muſt be avoided on the eaſt and ſouth ſides, as there is a ſhoal on the ſouth extending to a conſiderable diſtance from the ſhore. At a third part of the diſtance between the road at Talcaguana, and the point of the ſame name, is another ſhoal, running about half a league towards the eaſt, in the middle of which is a ridge of rocks. To avoid this ſhoal, it is beſt at entering the bay with a land wind, to ſteer directly for the middle of a ſpot of red earth on a mountain of middling height, ſituated at the bottom of the bay, continuing this courſe till the ſhip has paſſed the ſhoal; and then to ſteer directly for the houſes at Talcaguana, till within about half a mile from the ſhore, which is the uſual anchoring place in 5 or 6 fathom water. The ſame care is alſo neceſſary to avoid another reef of rocks, lying between the Morro and the coaſt of Talcaguana.

Conception, or *Conception de los Pampas,* a town of South America, in Paraguay, on the S. ſide of the river Plata. S. lat. 36° 30′. W. long. 57° 11′.

Conception, *La,* a ſea-port town of America, in the province of Veragua, on the Spaniſh main, with a harbour, formed by the river Veragua; 90 miles W. of Panama. N. lat. 8° 52′. W. long. 81° 51′.

Conception, a river of America, on the iſthmus of Darien, which runs into the Spaniſh main. N. lat. 9° 4′. W. long. 78° 15′.

Conception *Bay,* a large bay on the eaſt coaſt of Newfoundland iſland, whoſe entrance is between Cape St. Francis on the ſouthward, and Flamborough head on the northward. It runs a great way into the land in a ſouthern direction, having numerous bays on the W. ſide, in which are two ſettlements, Carboniere and Havre de Grace. Settlements were made here in 1610, by about 40 planters, under governor John Guy, to whom king James had granted a patent of incorporation. N. lat. 47° 40′. W. long. 52° 40′.

Conception *de Salava,* or *of Salaye,* a ſmall town of North America, in the province of Mechoacan, in Mexico. It was built by the Spaniards, as well as the ſtations of St. Michael and St. Philip, to ſecure the road from Mechoacan to the ſilver mines of Zacatea. N. lat. 10°. W. long. 83° 5′. They have alſo given this name to ſeveral boroughs of America, to a ſea-port of California, &c. &c.

Conception *de la Vega,* a town of Hayti, in what was formerly the Spaniſh part of Hiſpaniola, or St. Domingo. It gave the title of duke to the family of Columbus, the immortal diſcoverer of America.

Conception, in *Grammar.* See Syllepsis.

CONCEPTION, in *Logic* and *Metaphyſics*, the ſimple apprehenſion or perception which we have of any thing, without proceeding to affirm or deny any thing about it.

The ſchoolmen uſually make two kinds of conception; the one formal, the other objective.

The firſt is defined to be the immediate and actual repreſentation of any thing propoſed to the mind: on which footing, it ſhould be the ſame thing to the underſtanding, that a word or voice is to the ear; whence ſome alſo call it *verbum mentis*.

The ſecond is the thing itſelf repreſented by a formal conception. But others explode the notion of an objective conception, as being, in reality, no conception at all; excepting where the mind contemplates its own acts, &c.

Formal or proper conceptions, are ſubdivided into univocal, where ſeveral things are diſtinctly repreſented as under ſome common ratio, or in the ſame degree of perfection; analogous, where ſeveral things are repreſented as under ſome proportional likeneſs; and equivocal, where they are repreſented immediately as ſuch, without regard to any common ratio or likeneſs.

Dr. Reid, in his "Inquiry into the Human Mind, on the Principles of Common Senſe," and alſo in his "Eſſays on the Intellectual Powers of Man," (Eſſ. iv.), ſubſtitutes the word conception inſtead of the ſimple apprehenſion of the ſchools, and employs it in the ſame extenſive ſignification. He alſo uſes it, in common with ſome other writers, as ſynonymous with *Imagination*, which ſee. To this purpoſe, he ſays, that "conceiving, imagining, apprehending, underſtanding, and having a notion of a thing, are common words to expreſs that operation of the underſtanding, which the logicians call "*Simple* APPREHENSION;" which is defined by them to be the bare conception of a thing without any judgment or belief about it. However, although conception may be exerciſed without any degree of belief, even the ſmalleſt belief cannot take place without conception; for he who believes muſt have ſome conception of the object of his belief. Dr. Reid, without attempting a definition of this operation of the mind, explains ſome of its properties, ſtates different theories concerning it, and points out ſome miſtakes of philoſophers in their account of it. In every operation of the mind, ſays this writer, and in every thing which we call thought, there muſt be conception. Our ſenſes cannot give us the belief of any object, nor can we remember or reaſon, nor exert any of our active powers, without this mental operation; but in bare conception, there can, he thinks, be neither truth nor falſehood, becauſe it neither affirms nor denies. In this reſpect, conception differs from opinion; as an opinion, though ever ſo wavering, or ever ſo modeſtly expreſſed, muſt be either true or falſe; whereas a bare conception, which expreſſes no opinion or judgment, can be neither; to this purpoſe, Mr. Locke obſerves very juſtly, if we ſubſtitute conceptions for ideas, that our ideas, being nothing but bare appearances, or perceptions, in our minds, cannot properly and ſimply in themſelves be ſaid to be true or falſe, no more than a ſimple name of any thing can be ſaid to be true or falſe. Mr. Locke, following the example of Des Cartes, Gaſſendi, and other Carteſians, has given the name of perception to the bare conception of things; and he has been followed in this reſpect by biſhop Berkeley, Mr. Hume, and many late philoſophers, when they are diſcuſſing the ſubject of ideas. They have been probably led into this impropriety, ſays Dr. Reid, by the common doctrine concerning ideas, which teaches us, that conception, perception by the ſenſes, and memory, are only different ways of perceiving ideas in our own minds; and if that doctrine be well founded, he thinks that it will be very difficult to find any ſpecific diſtinction between conception and perception. He adds, there is reaſon to diſtruſt any philoſophical theory, when it leads men to corrupt language, and to confound, under one name, operations of the mind, which common ſenſe and common language teach them to diſtinguiſh. This author further obſerves, when he is tracing the analogies that ſubſiſt between the operations of body and thoſe of the mind in the plaſtic arts, and particularly in painting, that nothing more readily gives the conception of a thing than the ſeeing of an image of it; and hence, by a figure common in language, conception is called an image of the thing conceived. Nevertheleſs, the image in the mind is not the object of conception, nor is it any effect produced by conception as a cauſe, but it is conception itſelf. In this mode of illuſtrating conception, Dr. Reid differs from many other philoſophers, who have generally maintained, that in conception there is a real image in the mind, which is its immediate object, and diſtinct from the act of conceiving it. This author proceeds to trace the analogy that ſubſiſts, not only between conceiving and painting in general, but between the different kinds of our conceptions, and the different works of the painter. As this artiſt makes fancy-pictures, or copies from the painting of others, or paints from the life, that is, from real objects of art or nature which he has ſeen, our conceptions, in Dr. Reid's opinion, admit of a very ſimilar diviſion. Some conceptions may be called fancy-pictures, being commonly called creatures of fancy or of imagination, which are not the copies of any original that exiſt, but are originals themſelves. There are other conceptions, which may be called copies, becauſe they have no original or archetype, to which they refer, and with which they are believed to agree; and we call them true or falſe conceptions, as they agree or diſagree with the ſtandard to which they are referred. Theſe are of two kinds, *viz.* ſuch as are analogous to pictures taken from the life, or ſuch a we have of individual things that really exiſt; and ſuch as are analogous to the copies which the painter makes from pictures done before, which are the conceptions we have of what the ancients called univerſals, or of things which belong or may belong to many individuals. Theſe univerſals are always expreſſed by general words; and all the words of language, proper names excepted, are general words, or the ſigns of general conceptions, or of ſome circumſtances relating to them. Such general conceptions are formed for the purpoſe of language and reaſoning.

Having thus ſtated the three different kinds of our conceptions, and illuſtrated them at large, our author proceeds to deſcribe their different properties. Accordingly he obſerves, that our conception of things may be ſtrong and lively, or it may be faint and languid in all degrees. In this connection it is ſaid, that imagination, when it is diſtinguiſhed from conception, ſeems to ſignify one ſpecies of conception, *viz.* the conception of viſible objects. Again, our conceptions of things may be clear, diſtinct, and ſteady; or they may be obſcure, indiſtinct, and wavering. Moreover, when we barely conceive any object, the ingredients of that conception muſt either be things with which we were before acquainted by ſome other original power of the mind, or they muſt be parts or attributes of ſuch things Thus, a man cannot conceive colours, if he never ſaw, nor ſounds, if he never heard. If man has not a conſcience, he could not conceive what is meant by moral obligation, or by right and wrong in conduct. Nevertheleſs, we are unconfined with regard to the arrangement of the ingredients of our conception; and this laſt property of the faculty of conception, and that which eſſentially diſtinguiſhes it from every other power of the mind, is this, that it is not employed ſolely about things which have exiſtence.

The powers of ſenſation, of perception, of memory, and of conſciouſneſs, are all employed ſolely about objects that [illegible]; but conception is often employed about objects [illegible]ther do, nor did, nor will exiſt. To prevent imp[illegible]n in this matter, we ought to diſtinguiſh between that act or operation of the mind, which we call conceiving an object, and the object which we conceive. [illegible]ceive any thing, there is a real act or opera[illegible] mind; of this we are conſcious, and can have [illegible]ce; but every ſuch act muſt have an [illegible] conceives muſt conceive ſomething. For th[illegible] of conception ſtated by Dr. Reid, [illegible] upon them, we muſt refer to the ar[illegible] cloſes his account of the faculty of conception with an enumeration of what he conceives to be the errors into which writers have fallen in their diſcuſſion of the operations of the mind. In all judgment and in all reaſoning, he ſays, conception is included. We can neither judge of a propoſition, nor reaſon about it, unleſs we conceive or apprehend it; and therefore thoſe are miſtaken who ſo diſtinguiſh between conception, judgment, and reaſoning, as to imply, that a propoſition, or even a ſyllogiſm, may not be ſimply apprehended. Dr. Reid further obſerves, that the diviſion, commonly made by logicians, of ſimple apprehenſion into ſenſation, imagination, and pure intellection, ſeems to be, in ſeveral reſpects, very improper. Senſation, and the perception of external objects by the ſenſes, are, in his opinion, very different operations of the mind; and, though commonly conjoined by nature, they ought to be diſtinguiſhed by philoſophers. Neither ſenſation, nor the perception of external objects, is ſimple apprehenſion; becauſe both, as he thinks, include judgment and belief, which are excluded from ſimple apprehenſion. Moreover, thoſe who diſtinguiſh imagination from pure intellection, by referring to the imagination an image in the brain, and to pure intellection an image in the intellect, ground their diſtinction upon an hypotheſis; ſince we have no evidence, as he apprehends, that there are images either in the brain, or in the intellect. See Imagination. Dr. Reid further obſerves, that it is a miſtake to repreſent ſimple apprehenſion as the firſt operation of the underſtanding, and judgment as a compoſition or combination of ſimple apprehenſions, which miſtake probably has ariſen from ſuppoſing that ſenſation and the perception of objects by the ſenſes, are nothing but ſimple apprehenſion. Although theſe are very probably the firſt operations of the mind, they are not ſimple apprehenſions. See Perception. Inſtead of ſaying, that the more complex operations of the mind are formed by compounding ſimple apprehenſions, we ought rather to ſay, that ſimple apprehenſions are obtained by analyſing more complex operations. In this connection, Dr. Reid obſerves, that a ſimilar miſtake pervades the whole of Mr. Locke's Eſſay. It is this, that our ſimpleſt ideas or conceptions are got immediately by the ſenſes, or by conſciouſneſs; and the complex afterwards formed by compounding them. He notices alſo another miſtake concerning conception, which is, that our conception of things is a teſt of their poſſibility; ſo that, what we can diſtinctly conceive, we may conclude to be poſſible; and of what is impoſſible, we can have no conception. This opinion has been held by philoſophers for more than 100 years, without contradiction or diſſent, as Dr. Reid believes; and he conſiders it as a neceſſary conſequence of the received doctrine of ideas; ſince it is evident, that there can be no diſtinct image, either in the mind, or any where elſe, of that which is impoſſible. Our author has inveſtigated this opinion, and urged a variety of objections againſt it. Whatever, he ſays, is declared to be poſſible or impoſſible is expreſſed by a propoſition; and every propoſition, of which you underſtand the meaning diſtinctly, is poſſible. Farther, every propoſition, that is neceſſarily true, ſtands oppoſed to a contradictory propoſition that is impoſſible; and he that conceives one, conceives both: thus, a man who believes that two and three neceſſarily make five, muſt believe it to be impoſſible that two and three ſhould not make five. Again, mathematicians have, in many caſes, proved ſome things to be poſſible, and others to be impoſſible; which, without demonſtration, would not have been believed; "yet I have never found," ſays Dr. Reid, "that any mathematician has attempted to prove a thing to be poſſible, becauſe it can be conceived, or impoſſible, becauſe it cannot be conceived." Moreover, mathematicians often require us to conceive things that are impoſſible, in order to prove them to be ſo; and this is the caſe in all their demonſtrations, "ad abſurdum." For other particulars connected with the ſubject of this article, and a fuller view of Dr. Reid's illuſtration and reaſoning, we muſt refer to his Eſſays above cited.

A late excellent writer, to whom thoſe who wiſh to underſtand the philoſophy of the human mind are under great obligation, though they may not admit all his principles and reaſoning, has particularly conſidered the power of conception. By conception profeſſor Dugald Stewart (ſee his "Elements of the Philoſophy of the Human Mind," ch. iii.) means, that power of the mind which enables it to form a notion of an abſent object of perception, or of a ſenſation which it has formerly felt. Although this is not excluſively the proper meaning of the word, yet he thinks that the faculty now defined deſerves to be diſtinguiſhed by an appropriated name. Conception is often confounded with other powers: memory recognizes the features of an abſent or deceaſed friend, and every act of this faculty includes an idea of the paſt; whereas conception implies no idea of time whatever. Thus conſidered, the word conception correſponds to what was called by the ſchoolmen *ſimple apprehenſion*; with this difference only, that they included, under this name, our apprehenſion of general propoſitions; whereas the profeſſor wiſhes to limit the application of the word *conception* to our ſenſations, and the objects of our perceptions. By thus reſtricting the application of the term, more than Dr. Reid has done, our ideas become more diſtinct; and for ſuch a reſtriction the authority of philoſophers in an analogous caſe may be juſtly pleaded. In ordinary language, we apply the ſame word *perception* to the knowledge which we have by our ſenſes of external objects, and to our knowledge of ſpeculative truth; and yet an author would be juſtly cenſured, who ſhould treat of theſe two operations of the mind under the ſame article of perception. "Thus," ſays the profeſſor, "there is as wide difference between the conception of a truth, and the conception of an abſent object of ſenſe, as between the perception of a tree, and the perception of a mathematical theorem." For this reaſon, he has confined conception to that faculty, whoſe province it is to enable us to form a notion of our paſt ſenſations, or of the objects of ſenſe which we have formerly perceived. The buſineſs of conception, thus defined, is to preſent us with an exact tranſcript of what we have felt or perceived. The firſt remarkable fact which ſtrikes us with regard to conception is, that we can conceive the objects of our ſenſes much more eaſily than thoſe of others. Thus, we can conceive an abſent viſible object much more eaſily than a particular ſound, a particular taſte, or a particular pain, which we have formerly felt. This peculiarity ſeems to ariſe from this circumſtance, that when we think of a ſound, or of a taſte, the object of our conception is one ſingle detached ſenſation; whereas every viſible object is complex, and the conception which we form of it as a whole, is aided by the aſſociation of ideas, which connects the different parts together, and preſents them to the mind in their proper arrangement; whilſt the various relations which theſe parts bear to one another in point of ſituation equally contribute to ſtrengthen the aſſociations. This power of conceiving viſible objects may be much improved by habit. Theſe obſervations, together with others adduced by our author, are applicable to conception as diſtinguiſhed from imagination, though the two powers are very nearly allied, and often ſo blended, that it is difficult to ſay to which of the two ſome particular operations of the mind are to be referred. Among logicians, it is a common, and almoſt an univerſal doctrine, that conception (or imagination, often uſed as ſynonymous with it) is attended with no belief of the exiſtence of its object. To this purpoſe, Dr. Reid ſays, "perception is attended with a belief of the preſent exiſtence of its object; memory with a belief of its paſt exiſtence; but imagination is attended with no belief at all; and was therefore called by the ſchoolmen *apprehenſio ſimplex.*" Profeſſor Stewart controverts the truth of this principle, and alleges ſeveral circumſtances in juſtification of his doubts concerning it. "If it were a ſpecifical diſtinction between perception and imagination, that the former is always attended with belief, and the latter with none; then the more lively our imagination were of any object, and the more completely that object occupied the attention, the leſs ſhould we be apt to believe its exiſtence; for it is reaſonable to think, that when any of our powers is employed ſeparately from the reſt, and there is nothing to withdraw the attention from it, the laws which regulate its operation will be moſt obvious to our obſervation, and will be moſt completely diſcriminated from thoſe which are characteriſtical of the other powers of the mind. So very different however is the fact, that it is matter of common remark, that when the imagination is very lively, we are apt to aſcribe to its objects a real exiſtence, as in the caſe of dreaming or madneſs; and we may add, in the caſe of thoſe who, in ſpite of their own general belief of the abſurdity of the vulgar ſtories of apparitions, dare not truſt themſelves alone with their own imaginations in the dark. That imagination is in theſe inſtances attended with belief, we have all the evidence that the nature of the thing admits of; for we feel and act in the ſame manner as we ſhould do, if we believed that the objects of our attention were real; which is the only proof that Metaphyſicians produce, or can produce, of the belief which accompanies perception." The author acknowledges, however, that in moſt caſes it is true that imagination is attended with no belief, if by belief we mean a permanent conviction which influences our conduct. But if the word be uſed in the ſtrict logical ſenſe, he inclines to think, that the exerciſe both of conception and imagination is always accompanied with a belief that their objects exiſt. From a variety of obſervations, which we cannot ſtate within the limits of this article, the ingenious profeſſor infers, that when the conceptions of the mind are rendered ſteady and permanent, by being ſtrongly aſſociated with any ſenſible impreſſion, they command our belief no leſs than our actual perceptions; and, therefore, if it were poſſible for us with our eyes ſhut to keep up for a length of time the conception of any ſenſible object, we ſhould, as long as this effort continued, believe that the object was preſent to our ſenſes. See NOMINALS, REALISTS, and UNIVERSALS.

CONCEPTION, in *Phyſiology*, denotes the changes which take place in the internal organs of generation of the female ſex, connected with the developement and growth of the embryo. See GENERATION.

CONCEPTION, *in Animals*, is ſaid to be occaſioned by ſomething emitted by the male, in the act of coition, impregnating and vivifying the rudiments of an animalcule contained in the female. To explain in what manner this is effected, and to ſhew

> "How the dim ſpeck of entity began
> T' expand its recent form and ſtretch to man,"
> Garth.

has been the object of anxious inquiry from the earlieſt ages. But though much learning has been expended on the ſubject, and ſeveral ingenious theories contrived, to explain the myſtery (ſee GENERATION), yet very little of real knowledge has been obtained.

In this place, without deciding whether the male ſperm contains the animalcule, or only a ſubtle aura, giving life to ſomething engendered in the female, it will be ſufficient to obſerve, that the firſt effect of impregnation, or conception, will be found in one of the ovaries, or female teſticles, as they are called (ſee OVARY), and not in the uterus, as was generally believed.

That the ovaries are neceſſary to conception, has been long known, as is evident by the practice of ſpaying (that is, taking out the ovaries of) ſows and other animals, to prevent their breeding. The late Mr. John Hunter took one of the ovaries out of a ſow (Obſ. on the Animal Œcon. 4to.), and found ſhe left off breeding two years ſooner, and produced fewer pigs at each litter, than another ſow, kept with her, that was perfect. The perfect ſow continued breeding ſix years, and produced 162 pigs; the half-ſpayed ſow continued to be fruitful only four years, and brought only 76 pigs: whence he concluded, that there is a certain limited number of eggs in each of the female ovaries, and when they are exhauſted, the animal is no longer fit for conception.

Anatomiſts, in the courſe of their examination of the bodies of females, have found hair, teeth, and other organiſed parts in the ovaries; and ova, containing fœtuſes, have been found in the Fallopian tubes. (See FALLOPIAN *tubes*, alſo FOETUS *extra uterine.*)

On carefully examining into the contexture of the ovaria, they are found to conſiſt of cluſters of veſicles, like bunches of grapes, which are ſuppoſed to be ova or eggs.

When one of the veſicles, or eggs, as they are called, become ripe, it enlarges, and puts on a yellowiſh hue, and if at this time it ſhould be impregnated by the male ſperm, it burſts the thin membrane that confines it to the ovarium, enters the fimbriated end of the Fallopian tube, and thence deſcends into the uterus.

The rent in the ovarium, through which the ovum had paſſed, forms a cicatrice, which is called, from its colour, *corpus luteum.* (See CORPUS *luteum.*) On diſſecting the ovaria, there are always found as many of theſe corpora lutea, as the woman, the ſubject of the diſſection, had borne children.

While impregnation, or conception, is taking place in the ovarium, and the fertilized ovum is deſcending through the Fallopian tube, a proceſs is going on in the uterus, to prepare it for its reception. The veſſels of the uterus, which were before ſo extremely minute, as not to be viſible, begin to be conſpicuous; the whole organ is enlarged, and a ſecretion of a mucus takes place, and lines its internal ſurface. This mucus ſoon puts on the appearance of a rough and ſhaggy membrane, deſtined to become the medium of connection between the ovum and the uterus. The late Dr.

William Hunter called this membrane the decidua, becauſe it is caſt off at the birth of the fœtus. He was ſuppoſed to have firſt diſcovered it; but Needham, who publiſhed his "Obſervations de formato Fœtu," in 1667, gives a clear deſcription of it and of its office, but acknowledges that his account is taken from brutes; he never having had an opportunity of opening the body of a woman who had died undelivered. There are three membranes, he ſays, lining the uterus of viviparous animals when pregnant; "extima prorſus fibroſa eſt, nulla vena, aut arteria viſibili donata," p. 176: it ſerves as a ſheath, he ſays, to the other membranes. Though he gives no name to this membrane, yet, as he places it between the chorion and the uterus, it can be no other than the decidua. Harvey deſcribes it alſo ſtill more diſtinctly. Before any veſtige of the conception can be ſeen, he ſays, "mucoſa quædam filimenta tanquam aranearum telæ, ab ultimo ſive ſuperiore cornuum angulo ducuntur; quæ ſimul juncta membranoſam ac mucilaginoſam tunicam, ſive manticam vacuam referunt." Exercit. ſexageſima nova.

The ovum being received into the uterus, in a little time, puſhes out ſmall fibres, or veſſels, principally, perhaps, from that part by which it had been connected to its calyx in the ovarium, in a manner not diſſimilar to that by which an acorn is joined to its cup, or a hazel nut to its outer green ſhell. Theſe veſſels, piercing the decidua, which affords a ſupport to them, inſinuate themſelves into the pores of the uterus, and abſorb the moiſture from it, for the ſupport and increaſe of the ovum, as the young fibrils, or ſlender radicles of plants and trees, abſorb their nouriſhment from the earth. Although the uterus is intended by nature, and is thus prepared for the reception of the ovum, yet if it happens to be detained in the Fallopian tube, or to fall into the cavity of the abdomen, it there puts forth its radicles, and attaches itſelf to the part it happens to fall upon, or be in contact with, and the incloſed fœtus is nouriſhed and comes to maturity nearly in the ſame manner, as if it had been received in its proper matrix. (See FOETUS *extra uterine*, alſo FOETUS, *Nouriſhment of, in Utero*.)

On examining the ovum, ſoon after its deſcent into the uterus, it appears to contain a clear glutinous fluid, like the white of an egg; in a little time a concretion, like a ſmall maggot, is ſeen in the centre of the fluid, which is the primordium of the embryo. Very minute blood-veſſels are now viſible, branching upon a part of the chorion, hereafter to become placenta; the little galba, or maggot, being attached to it by ſlender threads, ſcarce a line in length, the future funis umbilicalis. At one extremity of the concrete three veſicles are ſeen, the rudiments of the eyes and brain; and beyond them, a crimſon moving point, the punctum ſaliens, or heart. Soon after, fine white filaments are perceived, variouſly circumvoluted, the inteſtines. The reſt of the viſcera are now faintly delineated; then the integuments covering and confining the viſcera; then the extremities, or limbs, begin to ſprout, at firſt ſhort ſtumps, without hands or feet, which at length emerging, complete the transformation. The whole fœtus is ſaid to be completely formed, by the end of the fourth week from the time of conception. See Harvey, De Generat. Anim.: and his predeceſſor, under whom he ſtudied at Padua, Fabricius ab Aquapendente. For the further developement and growth of the fœtus, ſee EMBRYO, and alſo FOETUS.

CONCEPTION, *Symptoms of, in Women.* As ſoon as a woman hath conceived, a train of ſymptoms commence, which announce ſome conſiderable alteration has taken place. "Mulier ubi concipit," Hippocrates ſays, "ſtatim inhorreſcit, et incaleſcit, ac dentibus ſtridet, et articulos reliquumque corpus, convulſio prehendit, et uterum torpor." A woman, as ſoon as ſhe has conceived, ſhivers, and then becomes hot, her teeth chatter, and ſhe ſuffers a ſlight convulſive motion of her whole body. And in another place, "Pregnantem mulierem, ſi aliter non cognoſcas, oculi tracti, et caviores fiunt, et candidum oculorum albedinis naturam non habet, ſed lividius exiſtit." Op. Om. cura Vand. Linden. t. ii. p. 285. In pregnancy the eyes become hollow, the whites of them loſe their clearneſs, and become thick and muddy. If towards the end of the term of uterine geſtation, he adds, the eyes become hollow, and the face and the whole body are affected with œdema, if the tips of the ears and of the noſe are white, and the lips livid, the child will be found to be diſeaſed or dead. Andreas Laurentius, who was phyſician to Henry IV. of France, recites the following circumſtances, as indicative of a woman having conceived. "Nos mulierem concepiſſe exiſtimamus," he ſays, "ſi in ſeminum concurſu totum corpus leviter cohorruerit, aut titulatu quodam uterum contrahi perceperit; ſi exceptum cum voluptate ſemen non exciderit; ſi uteri os internum exquiſitè conniveat; ſi menſtrua ſubſiſtat purgatio; ſi lenis doloris ſenſus circa umbilicum et hypogaſtrium oberret; ſi mammæ obdureſcant, extuberant, perdoleant; ſi veneris appetentia langueſcat; ſi ocyſſimè lætatur, et ſubinde mœrore afficiatur; denique ſi in eduliis faſtidium." We know a woman to have conceived, if immediately after copulation ſhe is affected with ſhivering; if the ſemen, received with pleaſure, is not ſuffered to eſcape; if the mouth of the womb is found to be completely cloſed; if a ſlight ſenſe of pain is perceived about the navel; if ſhe ceaſes to menſtruate, and the breaſts become large, hard, and painful; if the appetite for venery abates; if ſhe has frequent and ſudden changes from mirth to ſadneſs; and, laſtly, if ſhe has a loathing to her uſual food, and a deſire for things before indifferent, or to which ſhe had an averſion. Theſe obſervations are in general juſt, and may ſerve to ſhew the accuracy with which the ancients noticed the minuteſt circumſtances; but they are for the greater part ſuch as we can make little uſe of in practice; as we ſhould neither be permitted to inquire whether a ſuperior degree of pleaſure was felt at the moment of coition, or whether the ſemen was retained, or to examine whether the os uteri was completely cloſed. Waving, therefore, theſe minutiæ, it will be ſufficient to deſcribe the moſt uſual ſymptoms attendant on conception and pregnancy, in the order they occur, and to make ſome obſervations on each of them, with the view of ſhewing the cauſes from which they are derived, and the means by which they may be mitigated, or appeaſed, when they are ſo violent as to endanger abortion, or are likely to occaſion any permanent evil to the conſtitution.

The firſt ſymptom by which women judge themſelves to have conceived, is an intermiſſion of the regular diſcharge of the menſes. This is ſo general, that women who have been accuſtomed to be regular, always date their conception from the time they firſt miſs their courſes, as they are popularly called; and in this judgment, they are almoſt conſtantly right, unleſs fever, or ſome other cauſe has intervened, to which the interruption of them may be attributed.

Nauſea and vomiting are alſo pretty conſtant attendants on pregnancy. Theſe are moſt troubleſome in the morning, and often commence before the period for meſtruation arrives. They have been ſuppoſed to be occaſioned by the ſubſidence of the uterus into the pelvis, dragging part of the bowels with it. But as they come on before the uterus has obtained ſufficient bulk to diſturb the bowels by its weight, they are with more propriety aſcribed to ſympathy, between the ſtomach and the uterus. Nauſea and vomiting, unleſs uncommonly violent, are rather to be eſteemed ſalutary than dangerous, and it has been obſerved, that women, attacked with theſe ſymptoms, are leſs liable to miſcarry, than thoſe who are free from them. Blood has even been known to be thrown up from the ſtomach, from the violence of the ſtraining, without any ſubſequent ill conſequence. When, however, the vomiting is extremely violent, and obſtinate, if there are alſo ſigns of plethora, or general fulneſs of the veſſels, two or three ſmall bleedings have often proved ſalutary. In the mean while the body ſhould be kept open, by adminiſtering gentle eccoprotics, which the coſtive ſtate of the bowels, incident alſo to pregnancy, makes particularly neceſſary. Infuſion of ſenna, with ſoluble tartar, or the bitter purging ſalt; lenitive electuary, rhubarb, magneſia, or caſtor oil, may be conveniently uſed, or emollient and opening glyſters, adminiſtered advantageouſly for this purpoſe. In the relaxed ſtate of the bowels, to which ſome delicate women are inclined, the confectio alkermes, or aromatica, given in weak cinnamon water, with three or four drops of the tincture of opium, twice or thrice a day, or from a quarter of a grain to a grain of opium may be given advantageouſly every night at bed time; where theſe have failed, the diarrhœa has been removed, by giving occaſionally, in addition to the above, ſmall doſes of ipecacuanha; or, laſtly, by change of air, all other methods having proved unſucceſsful.

The diſpoſition to vomiting uſually ceaſes between the fourth and fifth month, or ſoon after the woman has quickened, (ſee QUICKENING). The uterus now riſing above the brim of the pelvis, and entering into the cavity of the abdomen, is leſs preſſed upon by the neighbouring parts, and has more room for diſtenſion; perhaps alſo having been long uſed to the irritation, occaſioned by the increaſe of the ovum, it is leſs ſenſibly affected by it. In ſome conſtitutions, however, the ſickneſs and vomiting continue to haraſs the women through the whole courſe of pregnancy: yet even in theſe caſes, although the vomiting is ſo inceſſant, that the whole of what is taken into the ſtomach ſeems to be ejected that way, yet ſuch women have ordinarily as favourable labours, produce as healthy children, and recover from child-birth as ſpeedily and completely as thoſe who paſs through their pregnancy with only the uſual ſickneſs.

Subſidence, or falling in of the abdomen, ſo as to be leſs prominent than uſual, is conſidered as another of the early ſymptoms of pregnancy.

Dans une ventre plat
Un enfans il y a,

as the old French proverb has it. This has been ſaid to be occaſioned by the deſcent of the uterus into the pelvis, drawing with it a portion of the bowels, but with little propriety. The real cauſe ſeems to be emptineſs of the bowels: Women not only vomiting up the greater part of the food they take in, during the firſt five or ſix weeks of their pregnancy, but being uſually during that time ſo troubled with nauſea, as to have little inclination to take ſuſtenance.

The aureola, or circle round the nipple, which in virgins is of a beautiful pink colour, becomes darker, it is ſaid, after conception. It is certain, the aureola is darker in women who have had children, than in thoſe who were never pregnant, and in ſome women who have borne many children, it becomes of a dark chocolate colour, but as that colour continues after child-birth, no indication can be taken thence, whether the woman is actually pregnant, unleſs perhaps with the firſt child.

Enlargement, hardneſs, and tenderneſs of the breaſts, with pains darting through them, and a diſcharge of a thin paliſh milk, or whey, are commonly attendant on a pregnant ſtate. This alteration in the ſtate of the breaſts uſually takes place in the third or fourth month after conception, ſometimes earlier, and is indicative of the preparation making in them for the ſecretion of milk, the future nouriſhment for the child. If from this plump and firm ſtate, the breaſts ſubſide, and become looſe and flaccid, unleſs a violent diarrhœa may have ſupervened to occaſion it, the fœtus may be expected to be weak, ſickly, or dead.

Cardialgia, or heart-burn, is a frequent and troubleſome attendant on pregnancy. (See CARDIALGIA). This has obtained its name cardialgia, from its being ſuppoſed to be an affection of the cardia, or upper orifice of the ſtomach. A ſenſe of burning, or of intenſe heat, moleſts the patient, which demands almoſt inceſſant drinking to appeaſe it. As the uterus enlarges, it thruſts the inteſtines higher into the abdomen, hence the liver, and other viſcera, are diſturbed and ſtraightened, and thence probably a more plentiful ſecretion of bile, which flowing into the ſtomach, is thought to occaſion this uneaſy ſenſation, which is obſerved to be more troubleſome in a recumbent, than in an upright poſture. Pills with ſoap and rhubarb, Columbo root, magneſia, and other teſtaceous powders, are found to be the moſt uſeful medicines in this complaint. Milk and water, pyrmont and other chalybeate waters, bark and tonics are alſo ſerviceable; but it ſometimes reſiſts every medicine, and only ſubſides after the food is digeſted, and the ſtomach is nearly emptied. This points to the only preventive, abſtinence. Women ſubject to this complaint ſhould content themſelves with the lighteſt diet, and that taken in ſmall quantities. In the mean while, the rhubarb, ſoap, and Columbo, ſhould be perſiſted in to help digeſtion, and to cleanſe and empty the bowels.

Cramp, attacking the legs, thighs, or belly, is alſo a frequent attendant on the pregnant ſtate. This is probably occaſioned by the preſſure of the head, or other part of the fœtus on the iliac or neighbouring nerves, and conſequently becomes more troubleſome the farther the woman advances in her pregnancy. An unnaturally irritable ſtate of the nervous ſyſtem ſeems to be the pre-diſpoſing cauſe of this complaint. Hence, perſons in the higher ranks of life, whoſe conſtitutions are debilitated by ſitting up late at nights, by large companies, luxurious diet, &c. are moſt frequently tormented by it. A more ſimple diet, early hours, exerciſe in the open air, keeping the bowels empty, bark, and other bitter and tonic medicines, promiſe moſt, both in preventing and curing this troubleſome complaint.

Of the ſymptoms here enumerated, many are equivocal, as happening indifferently in the pregnant, or in the unimpregnated ſtate; and none of them are ſingly of ſufficient validity, to enable us to form a deciſive opinion from them; but from the conjunction of ſeveral of them, a pretty certain conjecture may be formed. If a woman accuſtomed to be regular, ſoon after marriage ceaſes to be ſo, and about the ſame time is affected with nauſea and vomiting, there would be little hazard in pronouncing ſuch a perſon to be pregnant. But where the ſymptoms are equivocal, it is always beſt to defer giving a deciſive opinion, until the commencement of the ſixth month, when from the motion of the fœtus, and the increaſed bulk of the abdomen, we may be enabled to determine with certainty.

About this time, a new train of ſymptoms ſucceeds, principally dependent on mechanical cauſes. The volume of the uterus, daily enlarging, preſſes on, and flattens the urinary bladder, and diminiſhes its capacity. Hence a more frequent neceſſity for making water. The uterus, at the ſame time, preſſing on the rectum, occaſions the alvine fæces to be diſcharged with difficulty; hence coſtiveneſs, and the return of the blood by the iliac and hæmorrhoidal veins being prevented, by the ſame cauſe, the piles; hence, alſo, œdematous ſwellings of the legs, thighs, and labia pudendi.

The labia pudendi, conſiſting almoſt entirely of cellular membranes, are ſometimes ſo enormouſly diſtended as to prevent the perſon from walking, and to occaſion conſiderable pain. Scarifying the labia, or making two or three punctures with a lancet, the parts being afterwards fomented with warm water, ſometimes ſucceeds in reducing theſe ſwellings. Bleeding and moderate purges are alſo neceſſary. However formidable the appearance of the labia, when thus enlarged, may be, they offer no impediment to the labour, which is frequently, in theſe caſes, uncommonly expeditious. In theſe leuco-phlegmatic habits, the fibres ſeem to have loſt their tone or power of reſiſting, and to give way to the ſlighteſt impulſe, ſo that the child is frequently expelled by the moſt trifling effort. The hæmorrhoids, or piles, are not ſo tractable, but frequently elude every attempt to cure them, until after delivery, when they uſually ſoon ſubſide.

Varices, or enlargement of the veins of the legs and thighs, being dependent on the ſame cauſes, the preſſure of the uterus, preventing the return of the blood from the lower extremities, can only be palliated, until after the birth of the child, when they gradually vaniſh. It will be right, while waiting for this event, to moderate the diſtenſion of the veins, and prevent their burſting, by keeping in a recumbent poſture, and by wearing bandages around the parts. The piles may be relieved by taking a deſert ſpoonful of cream of tartar every day, and by anointing them with a preparation, conſiſting of galls of Aleppo reduced to an impalpable powder, and mixed to the conſiſtence of an ointment with cold drawn linſeed oil, or green tea, macerated in boiling water, may be applied as a poultice.

An idea prevails among women, that it is neceſſary they ſhould take a greater quantity of nouriſhment during the pregnant ſtate, than at other times, as they are then to furniſh ſuſtenance to an additional being; and they frequently, at the exhortation of their friends, take in a greater quantity of food than they have any inclination for, leſt they ſhould deprive the child of its neceſſary nouriſhment. But as no more of the food they ſwallow can be of uſe for that purpoſe, than what is properly digeſted, and as all the ſymptoms ſhew the depreſſed ſtate of the ſtomach, it is evident that by loading that organ unneceſſarily, all the complaints incident to the pregnant ſtate will be aggravated and increaſed. The greater part of the bile being diſcharged by vomiting, during pregnancy, a ſufficiency does not remain to complete the digeſtion of the food, to which it greatly contributes. Hence the chyle, admitted in too crude a ſtate into the veſſels, by its ſtimulus, excites after every meal a kind of hectic, by which the body is emaciated, the face is contracted, or ſhrunk, and the eyes, as Hippocrates obſerved, become ſunk or hollow. In this ſtate, therefore, an increaſed quantity of food, by increaſing the labour of digeſtion, adds to the miſchief. A moderate diet, with a due quantity of vegetables, and of ripe fruit, with country air, when it can be obtained, are the beſt remedies, and are to be recommended in every caſe during pregnancy.

It has been obſerved, that the ceſſation of the menſes is one of the earlier ſigns of pregnancy; but ſome women continue to have a diſcharge of blood from the pudenda, recurring at longer or ſhorter intervals, for the firſt four, five, or ſix months of their pregnancy; but the return of theſe diſcharges is rarely regular, recurring at the end of the ſecond, third, or fourth week, and ſometimes at the end of longer intervals. The quantity alſo varies, being ſometimes more ſparing, at others more profuſe than the menſes uſually are. Theſe diſcharges happen whenever any portion of the placenta, or membranes, is detached from the uterus, and generally terminate in abortion, or the premature birth of the fœtus; or, if the woman carries her burthen to the end of the ninth month, the child is uſually weak, ſickly, or dead born. "Si pregnanti," Hippocrates ſays, in the place laſt quoted, "purgationes menſtruæ curſum ſuum teneant, bene valere fœtum eſt impoſſibile." A ſlender diet, with occaſional ſmall bleedings, and mild purges are the beſt preventives, in theſe caſes.

Pica, or an irregular or depraved appetite, exciting women to long for, or intenſely deſire, ſome particular kind of food, is ſometimes an attendant on pregnancy. (See Pica.) This formerly, from an improper indulgence of the appetites and fancies of pregnant women, was a very troubleſome, and ſometimes a formidable affection; as not only the health and life of the mother, but the perfection of the fœtus, were ſuppoſed to depend on gratifying theſe longings. If a child happened to be born with ſome mark or blemiſh on its body, the memory of the female relatives or friends was racked, to recollect ſome deſire of the woman that had been diſappointed, to which the accident was attributed. Sometimes, however, theſe marks were ſuppoſed to have been occaſioned by the ſudden ſight of ſome object, which it was thought to reſemble.

This idea of the power of the imagination of the mother, in marking or diſfiguring the fœtus, is ſo ancient that we can ſcarce trace its origin. We read in Geneſis, that Jacob placed peeled rods before the ewes when in company with the rams, "and it came to paſs, that when the ewes looked at the rods, that the lambs they yeaned, were party-coloured, and ſtreaked." And Heſiod, the moſt ancient of the Greek poets, ſays, "Ne quis rediens e funere, liberis operam det, ne imaginatio rei triſtis, in proles tranſeat, eaſque permutet." Let no one returning from a funeral, embrace his wife, leſt the melancholy he had contracted, ſhould make an impreſſion on the fœtus. Dr. Daniel Turner, who was an intire convert to the opinion, has made a large collection of ſtories of monſtrous births, all occaſioned, he ſays, by the diſappointed longings of their mothers, or by their being frighted by the ſight of ſome hideous or miſhapen objects. See his Treatiſe, De Morbis cutaneis. lib. xii. Turner's book was anſwered by Dr. Blondee, in a maſterly and ſatisfactory manner. The opinion is now wearing away very faſt, and bids fair in a little time to be totally obliterated. See Imagination.

When the appetite, during pregnancy, is inordinate or depraved, requiring improper food, it may be remedied by taking ſmall doſes of ipecacuanha, of rhubarb and magneſia, of Columbo, and other bitter and tonic medicines.

Conception, *immaculate*, of the Holy Virgin, is a feaſt eſtabliſhed in honour of the Holy Virgin; particularly with regard to her having been conceived and born immaculate: *i. e.* without original ſin; held in the Romiſh church on the 8th of December.

The Latin church, ſays Gibbon, (Hiſt. of the Decline and Fall of the Roman Empire, vol. ix. p. 265.) has not diſdained to borrow from the Koran the immaculate conception of the virgin-mother. It is darkly hinted in the Koran (c. 3. p. 39.) and more clearly explained by the tradition of the Sonnites. (Sale's Note, and Maracci, tom. ii. p. 112.) In the 12th century, the immaculate conception

tion was condemned by St. Bernard as a preſumptuous novelty. However Allatius, in his Prolegomena on Damaſcenus, endeavours to prove this feaſt to have been celebrated by ſeveral churches in the Eaſt, as early as the eighth century. It was firſt eſtabliſhed about the year 1138, though it is not known, with any degree of certainty, by whoſe authority it was introduced, nor in what place it was firſt celebrated; about 1140 certain churches in France began to obſerve it; but it had been obſerved in England, in conſequence of the zeal of archbiſhop Anſelm, before this period.

The church of Lyons in France was one of the firſt that adopted this new feſtival, but the canons of Lyons were ſeverely cenſured by St. Bernard for the innovation, and he vigorouſly oppoſed the immaculate conception of the Virgin, becauſe it ſuppoſed her being honoured with a privilege which belonged to Chriſt alone. Thus commenced a controverſy, which occaſioned two parties in the Chriſtian church that contended with each other for ſeveral centuries.

This has been a great ſubject of controverſy between the Scotiſts and Thomiſts; the former maintaining, and the latter impugning it.

The Dominicans eſpouſed the party of St. Thomas, and held out a long time in defence of the Virgin's being conceived in original ſin. When this controverſy was renewed at Paris in 1384, by John de Monteſono, a native of Arragon, a Dominican friar and profeſſor of divinity, who publicly aſſerted that all who believed the immaculate conception were enemies of the true faith, the college of divines, and the whole univerſity of Paris, condemned this and ſome other tenets of Monteſonus. Upon this the Dominicans, together with their champion Monteſonus, appealed from the ſentence of the univerſity to pope Clement VII. at Avignon, (the name aſſumed by cardinal Robert of Geneva, on his election during the pontificate of Urban VI.) and raiſed an outcry, that St. Thomas himſelf was condemned by the judgment paſſed upon their brother. But, before the pope could decide the affair, the accuſed friar fled from the court of Avignon, went over to the party of Urban VI., who reſided at Rome, and thus, during his abſence, was excommunicated. Whether or not the pope approved the ſentence of the univerſity of Paris is not aſcertained. The Dominicans, however, deny that he did, and affirm, that Monteſonus was condemned merely on account of his ſlight; though there are many others who aſſert, that his opinion was alſo condemned. And as the Dominicans would not acknowledge the ſentence of the univerſity to be valid, they were expelled in the year 1389, and were not reſtored to their ancient honours in that learned body till the year 1404. The council of Trent, ſeſſ. v. in the decree of *original ſin*, declares it not to be the intention of the council to include the Virgin under it; her conception it calls immaculate; and appoints the conſtitutions of Sixtus IV. to be obſerved with regard to it.

This controverſy between the Dominicans and Franciſcans was revived in the ſeventeenth century; and a feſtival was appointed by Clement XI. in 1708, to be celebrated throughout the Romiſh church: however, the Dominicans perſiſt in denying the obligation of this law, and in maintaining their ancient doctrines.

In the three Spaniſh military orders of St. James of the Sword, Calatrava, and Alcantara, the knights take a vow, at their admiſſion, to defend the immaculate conception. This reſolution was firſt taken in 1652.

Peter d'Alva and Aſtorga have publiſhed forty-eight huge volumes in folio, on the myſteries of the conception.

Conception, *Order of*, in Germany, was inſtituted in 1618, by Charles de Gonzaguez of Cleves, duke of Nivernois and Rheteblois, and was confirmed by pope Urban VIII. in 1624. The badge of this order was a golden croſs of eight points enamelled blue; in the centre a medallion rayonnated gold, thereon the image of the Virgin ſtanding on a creſcent, holding in her arms our Saviour, and round her head 12 ſtars all enamelled proper; the reverſe was enamelled as the front, and on the medallion St. Michael; the whole of the ſtar environed with the cordon of St. Francis, tied at the bottom: this badge was worn round the neck pendent to a ſky blue ribbon.

Conception, *religious of the order of*. See Theatines.

CONCEPTUALISTS, in *Logic* and *Metaphyſics*, a denomination given to a party of nominaliſts, who took a middle road between the two ſects of nominaliſts and realiſts, into which the ſcholaſtic philoſophers were divided from the beginning of the twelfth century. That univerſality, which the realiſts hold to be in things themſelves, and the nominaliſts in name only, the conceptualiſts hold to be neither in things nor in names only, but in our conceptions, whence they derived their appellation; but being expoſed to the batteries of both the oppoſite parties, they made no great figure. It is not an eaſy matter, ſays profeſſor Dugald Stewart (Elem. of the Philoſophy of the Human Mind, p. 192), to aſcertain preciſely the meaning of the conceptualiſts on the point in queſtion, their language on the ſubject being indiſtinct and inaccurate; but the profeſſor thinks that, upon the whole, it amounted to the two following propoſitions: firſt, that we have no reaſon to believe the exiſtence of any eſſences, or univerſal ideas, correſponding to general terms; and, ſecondly, that the mind has the power of reaſoning concerning genera, or claſſes of individuals, without the mediation of language. In denying the exiſtence of univerſals, the conceptualiſts agreed with the nominaliſts. To what then, can we ſuppoſe, ſays the profeſſor, that they differed from them, but about the neceſſity of language, as an inſtrument of thought, in carrying on our general ſpeculations? Mr. Locke is referred by Dr. Reid (Eſſays on the Intellectual Powers of Man, p. 478) to the claſs of conceptualiſts. He does not maintain, that there are things which are univerſal; but that we have general or univerſal ideas which we form by abſtraction; and this power of forming abſtract and general ideas, he conceives, to be that which makes the chief diſtinction in point of underſtanding between men and brutes.

If Mr. Locke, ſays profeſſor Stewart (ubi ſupra), had any decided opinion on the point in diſpute, it did not differ materially from what is ſtated in the general propoſitions, which we have already cited. The apparent inconſiſtencies which occur in that part of his Eſſay in which the queſtion is diſcuſſed, have led ſubſequent authors to repreſent his ſentiments in different lights; but as theſe inconſiſtencies plainly ſhew, that he was ſatisfied neither with the ſyſtem of the realiſts, nor with that of the nominaliſts, they ſeem to demonſtrate that he leaned to the intermediate hypotheſis already mentioned, notwithſtanding the inaccurate and paradoxical manner in which he has expreſſed it. Dr. Reid's opinion ſeems to the profeſſor to coincide nearly with that of the conceptualiſts; or, at leaſt, to coincide with the two propoſitions, which are ſuppoſed to contain a ſummary of their doctrine. The abſurdity of the ancient opinion concerning univerſals, as maintained both by Plato and Ariſtotle, he has expoſed by the cleareſt and moſt deciſive arguments; and by his own very original and important ſpeculations concerning the ideal theory, he has, in the ingenious profeſſor's opinion, completely deſtroyed that natural prejudice from which the whole ſyſtem of univerſal ideas gradually took riſe. If, even in the caſe of individuals, we have no reaſon to believe the exiſtence of any object of thought in the mind, diſtinct from the mind itſelf, we are at once relieved from all the difficulties in which philoſophers have involved themſelves, by attempting to explain, in conſiſtency with that ancient hypotheſis, the proceſs of the mind in its general ſpeculations. On the other hand, it is no leſs clear from Dr. Reid's criticiſms on Berkeley and Hume, that his opinion does not coincide with that of the nominaliſts; and that the power which the mind poſſeſſes of reaſoning, concerning claſſes of objects, appears to him to imply ſome faculty, of which no notice is taken in the ſyſtems of theſe philoſophers. However, he has no where poſitively aſſerted, that language is not an eſſential inſtrument of thought in our general reaſonings. At the ſame time, as he has not affirmed the contrary, and as he has declared himſelf diſſatisfied with the doctrines of Berkeley and Hume, his readers are naturally led to conclude, that this is his real opinion on the ſubject. His ſilence on this point is the more to be regretted, as it is the only point about which there can be any reaſonable controverſy among thoſe who allow his refutation of the ideal hypotheſis to be ſatisfactory. In conſequence of that refutation, the whole diſpute between the realiſts and the conceptualiſts falls at once to the ground; but the diſpute between the conceptualiſts and the nominaliſts (which involve the great queſtion concerning the uſe of ſigns in general ſpeculation) remains on the ſame footing as before. See Conception.

CONCERT, an aſſembly of muſicians, or a band of muſical performers aſſembled for the entertainment of muſical hearers.

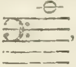
Concert *Spirituel*, Fr. A concert of ſacred muſic, originally eſtabliſhed at Paris in 1725, by permiſſion of the manager of the opera; which permiſſion was purchaſed by the brother of the celebrated Philidor, to perform concerts in Lent, on the days the theatres were cloſed, at the price of 1000 livres a year, for three years, on condition that no French muſic or ſelections from the opera ſhould be performed at theſe concerts. This firſt gave birth to the uſe of foreign muſic and foreign muſicians in France. The licence was renewed from time to time, but always at an advanced price, till it amounted, in 1749, to 9000 livres a-year. In 1734, the two celebrated Bezzozi's, from Turin, performed at the concert ſpirituel, one on the hautbois and the other on the baſſoon, with more applauſe than any foreign muſicians had ever before received in France. The celebrated Mondonville had the direction of this concert for ſeveral years, and compoſed expreſsly for its uſe motets for a ſingle voice, accompanied by a rapid and difficult harpſichord leſſon. It was at the concert ſpirituel, which, like our oratorios, takes place when no dramatic performances are allowed, that Giornovichi, La Motte, Viotti, the Agujari, Madame Mara, the Todi, Savoi, and David, were firſt heard in France; and afforded the inhabitants of Paris an opportunity of comparing the muſic and performance of foreign muſicians with their own.

In 1749, during Lent, Geminiani had a concert of ſacred muſic at Drury-lane theatre, the vocal pieces were all Italian to Latin words. Geminiani himſelf led the band on this occaſion, and played one of his own ſolos. This performance, in imitation of the French, was called Concerto Spirituale.

In Italy and Spain, *academia*, Ital. implies a concert. In France, Academie Royale de Muſique, was the title given at Paris to the eſtabliſhment of the opera under Lulli by Louis XIV. in 1672, which it retained till the revolution. Rouſſeau, the ſcourge of French muſic and French muſicians, traduced both ſo much in his famous letter on French muſic, that he was burnt in effigy at the Opera-houſe door. And in the article Academie *Royale de Muſique*, in the Encyclopedie, and Dict. de Muſique, he has given great offence by a pun; when after barely mentioning this academy, he only adds—"I ſhall ſay nothing further concerning this celebrated eſtabliſhment, except that of all the academies in the world, this is that which has made the *moſt noiſe*," *(le plus de bruit)*.

Concert-*Pitch*. This term, among muſicians, implies that particular elevation of tone, as to gravity or acuteneſs, which ought to obtain between different muſical inſtruments intended to be uſed in concert, which, when thus adjuſted, are ſaid to be tuned, or in tune. In concerts entirely vocal, or thoſe wherein adjuſtable or perfect inſtruments only are uſed, as violins, violincellos, &c., any preciſe pitch being fixed for the notes is immaterial, ſo that all the inſtruments derive their notes from ſome *one* ſound, within moderate limits of the pitch in general uſe, and for which the inſtruments were by their dimenſions calculated; ſingers therefore uſually derive their pitch from a ſimple wind inſtrument called a Pitch-pipe (ſee that article), becauſe the ſame admits of taking their key-note a little higher or a little lower than the note marked on the ſtopper of the pipe, according to circumſtances, and the nature of the piece of muſic to be performed. Violin performers, when no keyed-inſtruments are preſent, uſually derive their pitch from a ſimple ſteel fork, tuned to the note A, called a Tuning-fork (ſee that article.)

Inſtruments, which either from their large and complicated conſtruction, as organs, piano-fortes, &c., or the fixed nature of their notes, as baſſoons, oboes, flutes, &c., cannot admit of the occaſional variation in the pitch of all their notes which we have mentioned above, are regulated by the makers and tuners of them, to what is called by ſome the *concert-pitch*, and by others the *opera-pitch*; though others maintain that the latter, or that uſed by the Italian opera band, is higher than the uſual concert-pitch of the country. It were much to be wiſhed, that one invariable pitch were adopted and uſed, but this cannot be hoped for, until the ſame is accurately expreſſed by the number of pulſes or vibrations excited in the air in a given time by the given note; and the number of theſe vibrations is eſſential to be known, before the theory of *beats*, as laid down by Dr. Robert Smith in his "Harmonics," the only general and accurate method of tuning inſtruments to a required temperament, can be applied. We ſhall therefore firſt explain the different methods which have been invented for aſcertaining the exact number of vibrations made by any given muſical ſound, and conſequently of fixing its *pitch*, and then relate ſuch experiments as have fallen within our knowledge for determining what is the preſent concert-pitch in this country.

The problem being of conſiderable importance, we ſhall enumerate eight different methods of ſolving it; in order that experiments may be varied in different ways, both for obtaining greater accuracy, and that the coincidence of their reſults may inſpire confidence in the minds of ſuch as have not ſufficient mathematical knowledge or patience to go through the inveſtigations, on which the theory of the vibrations of a muſical ſtring, and the *beats* of an imperfect conſonance are founded: and ſince the note C-*ſol-fa-ut*, or that on which the tenor-cliff is placed, being alſo the ledger line above the baſe ſtaff , or the ſame below the treble ſtaff of muſic , is now generally made the key-note, in ſtating the notes of the octave, whether diatonic or tempered, we ſhall adopt each of the formulas, to the finding of the pulſes made by this note in ten ſeconds of time, to be determined by a ſtop-watch, a ſecond pendulum clock, or a ſimple pendulum, uſed for the expreſs purpoſe of determining periods of 10″ each. (See PENDULUM.)

The *firſt* method was ſuggeſted by Pere Merſenne. It conſiſts in a wire or catgut ſtring, of about 15 to 17 feet in length, over two fixed bridges at its extremities; and after this, dividing the diſtance between the bridges accurately into eight equal parts; then fixing another bridge at one of thoſe diviſions from the end; taking care that the new bridge, which ſhould have a tolerably ſharp edge or top, does not ſtrain the ſtring, or force it out of its ſtraight line. The tuning-fork, pipe, or ſtring C, upon the inſtrument whoſe pitch is to be determined, is now to be compared with the ſound of the $\frac{1}{8}$th part of the ſtring; and if its double octave below nearly agrees therewith, the tenſion of the whole ſtring is to be altered, as in tuning a ſtringed inſtrument, either tightening or ſlackening it, until the $\frac{1}{8}$th part is in exact uniſon with the double octave below the note C, without any beats or undulations: if the ſound of the $\frac{1}{8}$th of the ſtring ſhould be found on trial to give a clear muſical note, and yet differ very materially from the double octave below C, it may be neceſſary to aſſume a greater or leſſer length between the extreme bridges, and to determine anew the place of the bridge for the $\frac{1}{8}$th part thereof: and after the $\frac{1}{8}$th part has been nicely adjuſted to the double octave below the note C, as above, it will be proper again to compare the meaſure of the $\frac{1}{8}$th part of the ſtring with its whole length, to ſee that the points of bearing on the bridges are accurately adjuſted to theſe proportions. Now remove carefully the middle bridge, and cauſe the whole ſtring to vibrate, which it will be found to do ſo ſlowly, as not to cauſe an audible ſound, [if any ſound is heard, it will be one of the HARMONICS of that note, ſee that article, and TRUMPET], but ſo that its number of vibrations in 10″ can be ſeen and counted, eſpecially if a quill be held ſo near to the middle part of the ſtring, that it may touch it at each extremity of its vibration; 32 times the number of theſe vibrations will give the number of pulſes or complete vibrations made by C in 10″, and may be called its pitch.

The *ſecond* method is that which Dr. Robiſon uſed, wherein a machine, conſiſting of a combination of wheel-work, could be ſo regulated by the motion of a fly, that any given number of the teeth of a wheel ſhould paſs and ſtrike a quill projecting againſt them, during the ſpace of 10″. In uſing ſuch a machine as this, the velocity of the laſt wheel ſhould be ſo regulated, that the ſound produced by the ſnaps of the quill againſt the teeth, ſhould be in exact uniſon with the note C; when the known number of teeth which ſtrike the quill in the given time, will determine the pitch.

The *third* method is by the ſame learned and ingenious gentleman, who contrived an apparatus, regulated in the manner laſt deſcribed, which opened and ſhut the paſſage to an even current of air, produced by a pair of bellows, ſuch as are uſed in organs, any required number of times in 10″; this ſingular apparatus was found to give a clear muſical ſound, which regulated to an uniſon with C, gave the exact pitch thereof, by the number of alternate openings and ſhuttings of the cock in 10″.

The *fourth* method is founded on the following propoſition, by the author laſt mentioned, *viz.* "An open organ pipe, when ſounding its fundamental note, undulates with one node in its middle, and its undulations are analogous, in reſpect of their mechaniſm, with the vibrations of a wire of the ſame length, and the ſame weight, with the column of air in the pipe, and ſtretched by a weight equal to that of a column of the ſame air, reaching to the top of a homogeneous atmoſphere, or equal to the weight of a column of mercury, as high as that in the barometer." (See PIPES, *Theory of the Sound of*, TRUMPET, &c.) Whence this ſimple practical rule, when the barometer ſtands at about 30 inches, and the thermometer at about 55°, *viz.* divide the number 226620 by the length in inches and tenths, of an open cylindrical pipe which ſounds C, and the quotient will be the number of pulſes or complete vibrations made thereby in 10″.

The *fifth* method conſiſts in ſuſpending a known weight (equal to W grains) at one end of a wire, ſuch as is uſed for the loweſt notes of a piano-forte, the other end of which is lapped round a thumb-peg, ſuch as is uſed for tuning a violin, ſcrewed tightly into the wainſcot, near to an inſtrument whoſe pitch is to be determined; then by turning the peg, lengthen or ſhorten the vibrating part of the wire, until when ſtruck it ſounds exactly a double octave below C; meaſure exactly the length of the vibrating part of the ſtring, between its contact with the peg and the loop which ſuſtains the weight; call this L inches. After this, cut off exactly L inches of this ſame wire and weigh it, call its weight W grains; then will the number of complete vibrations or pulſes made by C in 10″ be found by the following theorem; *viz.* $\sqrt{\frac{154463 \times W}{L \times W}}$. See our article CHORDS.

The *ſixth* method is by Dr. Robiſon, and is as follows. Let a violin-guitar, or any ſuch inſtrument, be fixed up againſt a wall with the finger-board downwards, and in ſuch a manner that a violin-ſtring, ſtrained by a weight, may preſs on the bridge, but hang free of the lower end of the finger-board. Let another ſtring be ſtrained by one of the tuning-pins, till it be in exact uniſon with C, then hang weights on the other ſtring, till upon drawing the bow acroſs both ſtrings at a ſmall diſtance below the bridge, they are found to be perfect uniſons, taking care that the preſſure of the bow on the ſtrings is ſo moderate, as not to affect the tenſion of the ſtring firſt tuned. Then, having noted carefully the weight appended to the firſt ſtring, add one-fortieth part thereof to the ſame. Now draw the bow carefully again acroſs the ſtrings as before, and an audible *beating* will be heard between the ſounds of the two ſtrings; count the number of theſe beats during 10″, and 80 times this will be the number of complete vibrations, or pulſes, made by C in 10″.

The *ſeventh* method, as well as the beſt, depends on tuning a major comma; for which ſeveral rules are given under the article COMMA. From the octave below C tune upwards three ſucceſſive perfect *fifths* upon a ſingle ſtop of an organ, C G, G D, and D A; and thence tune downwards the perfect major *ſixth*, A C; which laſt C will be a major comma above the firſt C, and will beat conſiderably when ſounded therewith; count theſe beats during 10″, and 81 times this will be the number of complete vibrations, or pulſes of C in 10″. See Dr. Smith's Harmonics, p. 195.

The *eighth* method (Harmonics, p. 197.) conſiſts in tuning a major a major *ſixth*, C A, above C, not perfect, but ſuch that it may beat ſharp B times in 10″; from thence tune downwards three ſucceſſive perfect *fifths*, A D, D G, and G C; which laſt note will be an imperfect octave below C, the beats of which octave are to be counted during 10″, carefully diſtinguiſhing whether it beats ſharp or flat, and calling the number, if ſharp, S, and if flat, F; then will $81S + 16B$, or $16B - 81F$, according as the caſe may be, expreſs the number of complete vibrations, or pulſes of C in 10″.

It is not in our power to give ſo ſatisfactory an account of what is the preſent concert or opera-pitch in this country, as we could have wiſhed; but we hope that experiments will hereafter be multiplied, for fixing it very exactly (at a mean ſtate of the barometer and thermometer), and after ſuch determination, that the exact number of pulſes or complete vibrations from one extreme of the vibrations of a ſtring until its return to the ſame point, will be reſorted to by inſtrument-makers and tuners, for regulating the pitch of their forks, pipes, and inſtruments.

The vibrations, mentioned in M. Euler's experiment, (after our fifth method, under our article CHORDS) were ſemi-vibrations, or thoſe made, while a point in a muſical ſtring, went from and returned to the axis, or line of reſt, between the two points of ſuſpenſion, and not complete vibrations, or thoſe made while the ſtring went from and returned to the place of its greateſt deviation from the axis: therefore $\frac{392}{2}$, or 196, was the number of complete vibrations per 1″, made by the A, a minor third below our C; whence this made $\frac{6}{5} \times 196 \times 10 = 2351$ complete vibrations in 10″.

Dr. Robert Smith (Harmonics, p. 220 and 271), calculated about the middle of the laſt century, that the tenor clef C note, upon the organ in Trinity college, Cambridge, made $232\frac{1}{2}$ complete vibrations in 1″, or 2322 in 10″, which, he ſays, was above half a mean-tone lower than the London *opera pitch* at that time, and which therefore probably gave about 2460 or 2470 pulſes in 10″. The above experiment of Dr. Smith's was made, after Trinity college organ had been depreſſed a whole tone in its pitch, by making the keys each to act on two pipes lower in the ſcale than they originally did, by which it was reduced (Harmonics, p. 208, and 218) to the Roman *pitch*, or that to which the pitch-pipes, made about the year 1720, were generally tuned. Dr. Thomas Young, in his lectures at the Royal Inſtitution (Syllabus, p. 95), ſtates our C to make 256 vibrations in 1″, apparently only, for the purpoſe of agreeing with an imaginary C eight octaves below, which is to make but 1 vibration in 1″, but which imaginary C, according to the recent determinations of *concert-pitch*, which we are about to mention, ought to make but the $\frac{15}{16}$ part of a vibration in 1″, the 8th octave above which will be moved at the rate of 2400 pulſes in 10 ſeconds.

The late Dr. Robiſon applied our ſecond, third, and ſixth methods, for determining the complete vibrations made by C, and ſtates them all to agree extremely near with 240 in 1″, or 2400 in 10″. Many other experiments are upon record, but generally ſome other note than C was ſelected for the experiment, the exact interval between which and C we are ignorant of, owing to the temperament of the inſtrument; this is the caſe with Dr. Smith's determinations (by the fifth and others of the methods above, Harmonics, p. 192, &c.) of the vibrations made by D *la-ſol re*, upon the organ above-mentioned.

We were lately preſent at an experiment by Mr. John Iſaac Hawkins, at his houſe in Great Titchfield-ſtreet, where he manufactures the finger keyed viols and double-baſſes, mentioned under our article CLAVIOL, (ſee FINGER-KEYED VIOL) according to our firſt method above: two pieces of hard wood, about an inch thick, were ſcrewed down to the floor in his room, at about 22 feet aſunder, and were pierced for the two ſtring-pegs of a harpſichord wire; ſeveral thin pieces of wood with a ſharp edge at top, and riſing a very ſmall height more above the floor, than the fixed pieces of wood, were provided as moveable bridges. A braſs wire, called No. 15, by the piano-forte makers, and the largeſt ſize which they uſe in grand piano-fortes, which was found to be .033 inch diameter, was lapped round the pins, and ſtretched by turning one of them. From a point marked 0 on the floor, 8 or 10 inches from one of the fixed pieces of wood, the ſeveral diſtances $7\frac{1}{2}$ inches, 15, 30, 60, 120, and 240 inches were carefully meaſured and marked under the ſtring; a bridge was then placed under the ſtring, at the point 0; another at $7\frac{1}{2}$, and another at 240 inches, and one of the tuning pegs was turned until the ſhort portion of the ſtring, 0 to $7\frac{1}{2}$, was in perfect uniſon with Mr. H's ſmall, or mouth tuning-fork, C; [which is a very conſiderable improvement upon the large tuning forks which require to be ſtruck upon a table, ſee TUNING-FORK] the bridge at $7\frac{1}{2}$ inches was then ſucceſſively moved to 15 and 30 inches, in order to compare the octave and double octave below with the fork, and which on trial appeared to be accurately in tune. This middle bridge was then removed, and the counting of the viſible vibrations of the whole ſtring, 0 to 240, or five octaves below C, was conducted as follows. Mr. H. kneeling down on one knee, placed a ſeconds watch before him, and held a quill with one hand ſlightly againſt the ſtring, about two feet from the bridge, ſo as to be ſtruck by the wire at each vibration; this was for aſſiſting the ſight, in counting the vibrations, by means of the audible ſtrokes thus produced on the quill: for ſome time. Mr. H. continued attentively to notice the vibrations, and to beat down with his toe at every fourth vibration, as a performer on the violin, &c. does in playing in common time; this was purſued, until ſuch a regular rate of beating was obtained by the toe that the experiment was not interrupted by a new twitch or impulſe given to the vibrating ſtring by an aſſiſtant; the counting then commenced, and was continued during 60 ſeconds, in the firſt of which 111 beats of the toe were made, and in a repetition of the experiment, after examining the time of the $\frac{1}{32}$ part of the ſtring, 113 beats were counted; the mean of theſe, or 112 per minute, gave $112 \times 4 \div 6 = 74\frac{2}{3}$ vibrations for the whole ſtring in 10 ſeconds, and conſequently C, five octaves above, gave $47\frac{2}{3} \times 32 = 2386$ vibrations in 10″, which agrees extremely near with Dr. Robiſon's experiments above mentioned, in ſhewing, that 2400 may be taken as the preſent concert-pitch.

We have only to add, that an experiment and calculation ſome years ago by the fifth method above, gave us 2415 pulſes in 10″ for a tuning-fork then in our poſſeſſion, marked C, but whether the ſame had been adjuſted to the acknowledged concert-pitch, we are unable to ſay. The ſtate of the barometer and thermometer ſhould always be noted, at the time of making experiments of this kind, if it is intended accurately to determine the pitch: and it may be well, inſtead of truſting to the ear alone, in determining the uniſon or octave of the fork and ſtring, to count and equalize their *beats* with a third ſound, a little different from both of them, as recommended by Mr. Nicholſon, Phil. Journ. 8vo. i. p. 320, for the making of correct tuning-forks.

CONCERT *of Ancient Muſic.* This excellent eſtabliſhment was originally ſuggeſted by the late earl of Sandwich in 1776, in favour of ſuch ſolid and valuable productions of old maſters as an intemperate rage for novelty had too ſoon laid aſide as ſuperannuated, was ſupported with ſpirit and dignity, by the concurrent zeal and activity of other noblemen and gentlemen of the firſt rank, who united with his lordſhip in the undertaking, till 1785, when it was honoured with the preſence of their majeſties, whoſe conſtant attendance ever ſince has given to this inſtitution an elevation and ſplendor, which perhaps no eſtabliſhment of this kind ever enjoyed before. Here the productions of venerable old maſters, particularly thoſe of Purcell and Handel, are performed by a ſelect and powerful band, with ſuch correctneſs and energy, as the authors themſelves never had the happineſs to hear.

CONCERT, *To*, in a *Military Senſe*, is not only to deliberate upon, but to arrange, form, and agree upon plans of co-operation, for the purpoſes of either offence or defence.

CONCERTANTE, Ital. from *cancertare*, to concert, order, arrange. In the muſical technica, it uſed to be equivalent to harmonizing, adding inſtrumental parts to vocal. But at preſent, the term concertante is uſed ſubſtantively, for a ſymphony or full piece dialogued. In which there are ſolo parts for the diſplay of great talents on particular inſtruments. At the concerts of Bach and Abel, ſolo parts were frequently allotted in theſe compoſitions to Cramer, Fiſcher, the younger Stamitz, Hindmarſh, Shields, Holmes, Tacit, and the elder Florio, Abel, on the viol di gamba, and Bach himſelf on the piano-forte. Bach's concertante in C♮, and Pleyel's in E♭, were always heard with rapture; not only from the merit of the compoſition, but exquiſite manner in which they were performed, and the ingenuity of the written cadences, generally furniſhed by Fiſcher.

CONCERTATO, a term in *Muſic*, implying the addition of inſtrumental parts to a vocal compoſition; as *motetto concertato*, a motet or anthem, accompanied by inſtruments.

CONCERTO, ſynonymous with *concento*, which long ſupplied its place. Concento and ſuono implied nearly the ſame things in the days of Boccaccio, as concerto and ſonata ſince; but concertare and concertanti were at firſt applied to the union of inſtruments with voices, in motets and madrigals, by doubling the voice-parts. It was not till late in the ſeventeenth century, that inſtrumental pieces of many parts, began to be called concertos, and of few parts ſonatas.

The earlieſt compoſitions which we found in Italy, for three or more inſtruments of the ſame ſpecies, were Ricercari and Fantaſie. But of theſe none ſeem to have been printed, when the elder Doni publiſhed the ſecond edition of his "Libreria," 1557, as all the inſtrumental muſic that appears in his catalogue of muſical compoſitions, which had then been publiſhed in Italy, are "Intabolature da organi, et da leuto, d'Anton da Bologna, di Giulio da Modena, di Franceſco di Milano, di Jaches Buas, piu di dieci volumi, e la continua."

About the beginning of the ſeventeenth century madrigals, which were almoſt the only compoſitions in parts for the chamber, then cultivated, ſeem to have been ſuddenly ſupplanted in the favour of lovers of muſic by a paſſion for fantaſias of three, four, five, and ſix parts, wholly compoſed for viols, and other inſtruments, without vocal aſſiſtance. And this paſſion ſeems to have ariſen, from the calling in theſe inſtruments to reinforce the voice parts, with which they played in uniſon, in the performance of motets and madrigals, thence termed *concertati*. At length the inſtrumental performers diſcovered that both the poetry and ſinging of the times might be ſpared without any great loſs or injury to muſical effects; as the words, if good, were rendered unintelligible by fugue, imitation, and multiplicity of parts; and the ſinging, being often coarſe and out of tune, could be better ſupplied by their own performance. Thus vocal muſic not only loſt its independence, but was almoſt totally driven out of ſociety; as the ancient Britons, calling in the Saxons to aſſiſt them in their conflicts with the Picts, were themſelves ſubdued and forced from their poſſeſſions, by too powerful auxiliaries. See FANCIES and BASE-VIOLS.

Simpſon in his "Compendium," ſpeaking of fancies, page 118, ſays: "In my opinion, no nation is equal to the Engliſh in this way, as well for their excellence, as for their various and numerous conſorts of 3, 4, 5, and 6 parts, made properly for inſtruments, of which fancies are the chief."

In the MS. "Memoirs of Muſic," by the hon. Roger North, who ſpeaking of Jenkins, an eminent Engliſh compoſer in the time of Charles I. ſays, that "of all his concerts, none flew about with his name to it, ſo univerſally, as the ſmall piece called his "Five Bell Conſorte." And this is only in three parts, ſo that the import of the term concert or conſorte was not then ſettled.

Montaigne, who travelled through Italy and Germany in 1580, ſays that the maſs in great churches was accompanied by organs and violins. But though the word concerto occurs ſo early as the year 1587, in the "Trattenimenti" or "Divertimenti" of Scipion Bargagli, it was only applied to ſhort Fantaſie and Ricercari. Salmi concertati was often uſed when inſtruments were added to voices, in concerti eccleſiaſtici.

At the latter end of the 17th century moſt of Baſſani's, Corelli's and Torelli's violin muſic was compoſed for the church. The firſt and third ſet of Corelli's ſonatas, and his firſt eight concertos, we are certain were thus appropriated. Somis, Veracini, and Tartini, compoſed their own ſolo concertos, and performed them likewiſe in the ſeveral churches of Italy. And Pugnani uſed to accompany the "Meſſa Bolla," or Silent Maſs, at the chapel royal in Turin, with his violin ſolo concertos.

Concertos merely inſtrumental, for ſecular uſe, ſeem to have had no exiſtence before the time of Corelli. The honour of the invention has been aſſigned to Torelli, but from no good authority. Six concertos by Aleſſandro Scarlatti, manifeſtly, from the gravity of their ſtyle, compoſed for the church, were printed by Benjamin Cook, in New-ſtreet, Covent-garden, about the year 1730. But at the beginning of the laſt century, beſides the concertos of Corelli, Geminiani, and Handel, concertos by Albinoni, Alberti, Teſſarini, and Vivaldi, were diſperſed all over the kingdom, and heard with great delight at our country concerts, muſic-meetings, and clubs. Theſe were chiefly on the model of Torelli and Corelli, but with melody of a lighter kind. They were all in ſeven or eight parts for two choirs; that is, with ſolo parts for the concertini, or ſolo inſtruments, and ripieno parts for the concerto groſſo, or chorus of the whole band. But theſe were ſoon ſuperſeded by great performers on the violin, ſuch as Locatelli, Tartini, Somis, Veracini, Nerla, and Giardini, who, in order to diſplay their ſuperior powers of execution, rendered them too difficult for general uſe. But theſe being brought into public favour by the admirable performance of their ſeveral authors, were followed by the concertos of Barthelemon, Cramer, La Motte, Lolli, Salomon, Viotti, Giornovichi, &c. who, by ſome peculiar excellence in the knowledge of the finger-board, uſe of the bow, or accurate performance of double-ſtops, ſeem to have arrived at the acme of perfection in executing ſolo concertos.

Concerto *Groſſo*, a grand concerto, or full piece.

Concerts, *public.* Theſe were firſt eſtabliſhed in London by Baniſter, maſter of king Charles II's new band of 24 violins. The firſt notice we find of theſe aſſemblies is in the London Gazette, No. 742, for Dec. 30th, 1672, in which there is the following advertiſement: "Theſe are to give notice, that at Mr John Baniſter's houſe, now called the muſic-ſchool, over againſt the George Taverne, in White Fryers, this preſent Monday, will be muſic performed by excellent maſters, beginning preciſely at four of the clock in the afternoon, and every afternoon for the future, preciſely at the ſame hour."

There are other advertiſements from Baniſter of the ſame kind, in 1674, 1676, and 1678. In that for Dec. 11th, 1676, his muſical performance is ſaid to be "At the academy in little Lincoln's-inn fields," where it was to begin "with the parley of inſtruments, compoſed by Mr. Baniſter, and performed by eminent maſters."

In Mr. North's manuſcript "Memoirs of Muſic," we have a more minute account of theſe performances. "Baniſter having procured a large room in White Fryars, near the Temple back-gate, and erected an elevated box or gallery for the muſicians, whoſe modeſty required curtains, the reſt of the room was filled with ſeats and ſmall tables, alehouſe faſhion. One ſhilling, which was the price of admiſſion, entitled the audience to call for what they pleaſed. There was very good muſic, for Baniſter found means to procure the beſt hands in London, and ſome voices to aſſiſt him. And there wanted no variety, for Baniſter, beſides playing on the violin, did wonders on the flageolet to a thorough baſe, and ſeveral other maſters likewiſe played ſolos."

Theſe were followed by other public concerts of a ſuperior kind, at the Crown and Anchor, the Caſtle in Paternoſter row, the Swan and King's Arms, Cornhill, York Buildings, Hickford's Room, &c. &c.

CONCESSI, q. d. *I have granted*; a term much uſed in conveyances, &c. Its effect is to create a covenant in law, as *dedi* (I have given) does a warranty. Co. Lit. 384. This word is of a general extent, and is ſaid to amount to a grant, feoffment, leaſe, and releaſe, &c. 2 Saund. 96.

CONCESSION, in *Rhetoric*, a figure whereby ſomething is granted or allowed to the adverſary, either to prevent being detained by unneceſſary incidents, or to make ſome advantage of. "I will not conteſt with you the reality of the contract; what I plead for, is relief againſt the injuſtice of it." "True, ſhe is fair; but ought ſhe not to ſhew her acknowledgments to heaven for the favour, by making a virtuous uſe of her beauty?" See Epitrope.

CONCESSIT, Sur, in *Law*, a ſpecies of *Fine*; which ſee.

CONCEVEIBA, in *Botany*, Lam. Encyc. Aubl. Guian. 924. tab. 353. Claſs and order, *diœcia*. Nat. Ord. *Euphorbiæ*; Lam.

Gen. Ch. *Male* flower not known. *Female. Cal.* one-leafed, fleſhy, trigonous near the bottom, with three large glands at its baſe, terminated by five thick acute teeth, each of which has on the inner ſide of its baſe a gland preſſing upon the germ. *Piſt.* Germ ſuperior, triangular; ſtyle none; ſtigmas three, thick, concave, furrowed, incurved. *Peric.* Capſule globular, trigonous, with three furrows, three-celled, three-valved, each valve dividing into two. *Seeds*, one in each cell, roundiſh, inveloped in a white pulpy matter which has a ſweet pleaſant taſte.

Sp. C. *guianenſis*. A ſmall tree. *Trunk* ten or twelve feet high, about a foot in diameter, with grey bark and white wood, much branched. *Leaves* alternate, at unequal diſtances from each other, oval-oblong, acuminate, toothed, green and ſmooth on their upper ſurface, cinereous underneath. *Stipules* in pairs, ſmall, caducous. *Flowers* ſeſſile, alternate, in a terminal ſpike, common peduncle fleſhy, trigonous. A native of Guiana, on the banks of rivers. When the bark is cut, or the leaves torn, a greeniſh juice iſſues from the wound.

CONCEZE, in *Geography*, a town of France; in the department of the Correze, and diſtrict of Brive; 6 leagues N.W. of Brive.

CONCH, in *Mythology*. See Triton.

CONCHA *Auris*, in *Anatomy*, is the large hollow of the external ear, included between the tragus, antitragus, and anthelix, and having at its anterior part the commencement of the meatus auditorius externus. See Ear.

Concha, Χογχη, in *Antiquity*, a liquid meaſure among the Athenians, which contained two *myſtra*, or half an ounce. As much oil as it was capable of holding, weighed five drams one ſcruple and twenty grains, according to Gor. Defin. Pitiſci Lex. & Eiſenchom. Others think that the *concha* contained three ſpoonfuls, ninety-ſix of which filled a pint veſſel (*ſextarius*;); a *ſextarius* was therefore equivalent to thirty-two *conchæ*, and ſix *ſextarii* made one *congius*, a meaſure equivalent to our three quarts, according to Salmaſ. Exerc. Plinian. and Bodæus in Theophraſt. According to Fernelius, the concha was equivalent to two *myſtra*, or five ſpoonfuls; which, according to Jacobus Sylvius, are equivalent to ſix drams. According to Galen, in his work De Ponderibus & Menſuris, cap. 11, the *concha magna* contained the ſame quantity with the *acetabulum*, which in liquid meaſure was an ounce and a half, and in weight fifteen drams. The *concha minor* was in liquid meaſure half an ounce, and in weight five drams.

Concha, in *Conchology*. See Conchology.

Concha, in *Muſic*, a trumpet among ancient inſtruments, or a trump-marine, ſuch as Triton uſed;

—— Tritona vocat; conchæque ſonaci
Inſpirare jubet.
Ov. Met. 1.

Concha *anatifera*. See Anatifera.

Concha *anomia*, the name of a foſſil ſhell-fiſh, found in great abundance, and in a great variety of ſpecies, but not known in any of them living, on the ſhores or in the ſeas of our own or other countries. In Glouceſterſhire, and ſome other of our counties, theſe are found as common as pebbles on the ploughed lands in other places. They are a ſort of bivalve ſhell, the valves of which are of unequal extent, both of them convex, and the head or beak of the longer valve crooked, and falling over the head of the other.

The great general diſtinction of this numerous claſs of bodies, is into thoſe which are of a ſmooth ſurface, and thoſe which are of a ſtriated or rough one.

Others alſo of the ſame claſs, or of one very nearly allied to it, are found in many of our inland counties, ſome very long from the cardo, or hinge, to the margin; and others very ſhort, and very long the contrary way. They are found indifferently in all ſorts of ſtrata, in earth, in ſtone, in ſand, and among gravel. See Anomia.

Concha *fortificata*, a name given by ſome authors to the genus of ſhells, called by others the Murex.

Concha *globoſa*, the name of a large genus of ſhells, called by authors the Dolium, and in French the *tonne*.

CONCHÆ Lapideæ, was the name by which ſome writers diſtinguiſhed the foſſil ſhells found lodged in the ſtrata of the earth, before the whims of certain authors reſpecting the *vis plaſtica, vis formativa,* &c., by which they attempted to account for the formation of theſe organic remains, had been entirely exploded, and the truth of their being animal exuviæ generally eſtabliſhed.

Concha *margaritifera,* a name ſometimes uſed for thoſe *mytuli* which produce pearls. See Muscle.

Concha *margaritifera,* is the name by which ſome writers have deſcribed a foſſil ſhell, ſomewhat reſembling the recent ſhells of this genus, in the equality of their valves, the appearance of their guttered and toothleſs hinges, &c.

Conchæ *narium,* in *Anatomy,* is a term applied to the turbinated bones of the noſe. See Skeleton.

CONCHA *ſpectrorum,* in *Natural Hiſtory,* the *ſpectre ſhell,* a name given by authors to a ſpecies of voluta, from ſome odd figures deſcribed on its ſurface, repreſenting rough draughts of terrible phantoms. It is an elegant ſhell, of a middle ſize, and is of a white ground, and the figures are reddiſh; theſe form three large and broad bands, ſurrounding the ſhell at top and bottom, and in the middle; and between theſe there are ſeveral ſeries of ſmall ſpots. It is a ſcarce ſhell, and uſually ſells at a large price.

Concha *Veneris,* the name by which ſeveral ſpecies of chama are called. The ſhell is univalve, wreathed, and has a ſmall longitudinal and denticulated chink, or aperture, in it. It is alſo called *concha porcellana,* from its aperture in ſome meaſure reſembling the mouth of a hog; and *concha erythræa,* from its being found in the Red Sea, called *erythræum.* It is alſo called *concha cytheriaca,* from Venus, who received the epithet *cytheræa,* from Cythera, a Grecian iſland. That this fiſh was uſed by the ancients as an aliment, we read in Seneca, Ep. 95. Mundius aſſerts that they prove a ſtimulus to venery, and provoke urine. Rondeletius informs us, that theſe ſhells are an ingredient in the *pilulæ de bdellio,* for removing fluxes, and curing ulcers in the uterus. But inſtead of the *concha venerea,* the apothecaries generally uſe cockles. Excellent dentrifices are prepared from this ſhell, which is alſo uſed for curing ulcers in the canthus of the eye, and the *fiſtula lachrymalis.* It is remarkably drying, without exciting any heat.

CONCHARUM Promontorium, in *Ancient Geography,* a promontory of Aſia Minor, on the Thracian Boſphorus, in the ſouthern part of the Caſtacian gulf.

CONCHES, in *Geography,* a town of France, in the department of Eure, and chief place of a canton in the diſtrict of Evreux, 12 miles S. E. from Evreux, 39 S. from Roüen, and 87 N. E. from Paris. The place contains 2259, and the canton 13050 inhabitants. The territory includes 257½ kiliometres, and 33 communes.

Conches, a town of France, in the department of the lower Pyrenées, and diſtrict of Pau; 6 leagues N.N.E. of Pau.

CONCHITES, or Conchitæ, in *Natural Hiſtory,* a name which has been indifferently uſed by writers, in deſcribing foſſil bivalve ſhells of different kinds.

Conchites *marmor,* a name given by the ancients to a ſpecies of marble dug near Megara, and remarkable for containing a great number of ſea-ſhells, and other marine bodies immerſed in it.

CONCHIUM, in *Botany,* from κόγχη, a bivalve ſhell, in alluſion to the form of the fruit. Smith, Tr. of Linn. Soc. v. 4. 215. Donn. Cant. ed. 3. 21. Vent. Jard. de la Malmaiſon, 110. (Hakea; Schrad. Sert. 27. Cavan. Jc. v. 6. 24.) Muſcle-ſhrub. Claſs and order, *tetrandria monogynia.* Nat. Ord. *Proteæ,* Juſſ.

Gen. Ch. *Cal.* none. *Cor.* of four petals, linear, cohering at their baſe, ſomewhat dilated and concave at the ſummits, nearly equal. *Stam.* four; filaments ſhort, inſerted towards the ſummit of each petal: anthers lodged in the cavity of each petal, erect, oblong, two-celled. *Piſt.* Germen ſuperior, ſmall, ovate, oblique: ſtyle aſcending, recurved, cylindrical, thick, as long as the corolla; ſtigma turbinate, pointed. *Peric.* Capſule ovate, oblique, gibbous and rugged, pointed, of two hard, thick, woody valves, and one ſmall eccentric cell. *Seeds* two, elliptical, flat on one ſide, convex on the other, filling the cavity of the capſule, each furniſhed with a black, membranous, tranſparent, oblong wing.

Eſſ. Ch. *Calyx* none. *Petals* four, bearing the ſtamens. *Stigma* turbinate, pointed. *Capſule,* of one cell. *Seeds* two, winged.

Sp. 1. C. *gibboſum.* Donn. Cant. 21. (Bankſia gibboſa; White Voy. 224. t. 22. f. 2. Willden. Sp. Pl. v. 1. 536. Hakea gibboſa; Cavan. Ic. t. 534. H. pubeſcens; Schrad. Sert. 27.) "Leaves cylindrical, ſlightly downy, rather longer than the fruit. Corolla ſmooth. Capſules roundiſh-ovate, gibbous, rugged." Sm MSS. *Stem* ſhrubby, branched, rigid, ſmooth. Young branches hairy. *Leaves* numerous, evergreen, alternate, ſeſſile, ſpreading, cylindrical, near two inches long, ſomewhat downy, eſpecially when young, each tipped with a ſharp ſpine. *Flowers* in ſmall, axillary, hairy umbels, white. *Corolla* nearly or quite ſmooth. *Capſules* ſolitary, the ſize of a walnut, black and rugged, very gibbous underneath; the valves extremely thick, hard and woody, each tipped with a ſhort ſharp point; cavity very ſmall, eccentric, uneven, of a mahogany colour. *Seeds* with black wings like gauze or crape. A native of New South Wales, near Port-Jackſon. It is now frequent in the more curious European green-houſes, but is rather ſingular than beautiful. 2. C. *ſphæroideum.* "Leaves cylindrical, as long as the fruit, downy as well as the branches. Capſules orbicular, depreſſed, ſmoothiſh." Sm. MSS. A ſmaller ſhrub than the laſt. *Branches* clothed with denſe woolly hairs. *Leaves* about an inch long, very hairy. *Flowers* unknown in Europe. *Capſules* of a ruſty brown, the ſize of the laſt, but much leſs rugged, and when viewed vertically, almoſt orbicular, their points ſcarcely extending beyond the circumference. Sent from Port-Jackſon with the preceding. 3. C. *aciculare.* Donn. Cant. 21. Vent. Jard. de la Malm. t. 111. (Hakea ſericea; Schrad. Sert. 27?) "Leaves cylindrical, ſmooth, as long as the fruit. Corolla ſmooth. Capſules roundiſh-ovate, rugged, elongated at the point." Sm. MSS. Like C. gibboſum, but in all its parts about half as large. *Leaves* in every period of their growth quite ſmooth. *Flower-ſtalks* and young branches ſilky. *Fruit* more oblong than in the two preceding, but its lateral protuberances are more globoſe. A native of Port-Jackſon, not rare in our gardens. 4. C. *longifolium.* Donn. Cant. 21. (Bankſia teretifolia; Saliſb. Prod. 51?) "Leaves cylindrical, ſmooth, thrice as long as the fruit. Corolla clothed with ſilky hairs." Sm. MSS. *Leaves* three inches or more in length, ſpinous, as in all the foregoing, always ſmooth, as well as the branches. *Corolla* clothed with white, cloſe, ſilky hairs. Perhaps only a variety of C. *pugioniforme* hereafter deſcribed, which cannot be determined till the fruit of the preſent ſpecies be known. 5. C. *compreſſum.* "Leaves cylindrical, ſmooth, ſcarcely ſo long as the fruit. Capſules ovate, compreſſed, ſomewhat rugged." Sm. MSS. The fruit of this is not more than an inch long, and ovate, partaking but little of the globular protuberant figure of the preceding kinds. *Leaves* ſmall and ſlender. 6. C. *pugioniforme.* (Hakea pugioniformis; Cavan. Ic. v. 6. 24. t.

533. H. glabra. Schrad. Sert. 27. t. 17.) "Leaves cylindrical, ſmooth. Corolla clothed with ſilky hairs. Capſules lanceolate, pointed, beſet with ſharp tubercles towards the baſe." Sm. MSS. *Leaves* an inch or inch and a half long, bright green, always ſmooth, as well as the branches. *Flowers* white and ſilky. *Capſules* very different from the reſt of the genus, being much more ſlender. This, like all the preceding, is found in the country about Port-Jackſon, New South Wales. 7. C. *trifurcatum.* "Leaves cylindrical, three-cleft; ſometimes dilated, ſimple, elliptical and flat. Corolla hairy." Sm. MSS. This moſt remarkable ſpecies, diſcovered by Mr. Archibald Menzies, F.L.S. at King George's Sound, on the weſt coaſt of New Holland, is diſtinguiſhed by its three-forked leaves, but eſpecially by their occaſional variation from a cylindrical to a broad flat elliptical figure, on the ſame branch, and even in the ſame individual leaf. The *flowers* and their ſtalks are clothed with rough, ſhaggy, not ſilky, hairs. *Fruit* unknown. 8. C. *dactyloides.* Vent. Jard. de la Malm. t. 112. (C. nervoſum; Donn. Cant. 21. Hakea dactyloides; Cavan. Ic. v. 6. 25. t. 535. Bankſia dactyloides; Gærtn. v. 1. 221. t. 47. f. 2. B. oleæfolia; Saliſb. Prod. 51.) "Leaves obovate-oblong, with a ſmall point, triply nerved, veiny. Capſules ovate, acute." Sm. MSS. *Leaves* various in length and breadth, flat, thick, rigid, ſmooth, entire, obovate, tapering towards the baſe, marked with three principal nerves united above the baſe, and connected upwards by interbranching veins, forming ſometimes ſpurious nerves. The young leaves and branches are ruſty and downy. *Flowers* numerous, ſmall, white, ſmooth, on hairy ſtalks. *Capſule* ovate, acute, rugged, ſcarcely gibbous. Common about Port-Jackſon, and not rare in our gardens, where the varieties to which it is ſubject in the leaves, afford the nurſerymen an opportunity of furniſhing their friends with many new ſpecies. 9. C. *ellipticum.* "Leaves elliptical, bluntiſh, pointleſs, with five nerves, reticulated with veins. Capſules ovate, obtuſe." Sm. MSS. Allied to the laſt, but diſtinct. *Leaves* broad, exactly elliptical, ſomewhat glaucous, having five ribs, which all ſpring from the baſe, and deſtitute of any terminal point or ſpine. The ſpaces between the ribs or nerves are beautifully and copiouſly reticulated. *Capſule* more obtuſe than in C. *dactyloides*, but otherwiſe much like it. Found by Mr. Menzies at King George's Sound, but not yet brought alive to Europe. *Flowers* not ſeen. 10. C. *oleifolium.* "Leaves elliptic-lanceolate, with a ſmall point, ſingle-nerved. Capſules ovate, gibbous, ſomewhat rugged." Sm. MSS. Brought by Mr. Menzies from the ſame country as the laſt. Full-grown *leaves*, ſcarcely an inch and half long, ſmooth, even and entire, with only one rib, tipped with a little ſpine. Veins few and obſcure. *Flowers* ſpiked, ſmooth, as well as their partial ſtalks, though the common ones are hairy. *Capſule* ovate, gibbous on one ſide, very rugged all over. 11. C. *ceratophyllum.* "Leaves three-lobed, pinnatifid. Capſules ovate, compreſſed." Sm. MSS. *Leaves* very fine, large and divaricated, from two to four inches long, ſmooth, except when very young, hard and rigid, obſcurely ribbed, lobes and teeth ſpinous. *Flowers* ſilky. *Capſule* narrow, ovate, compreſſed, ſmooth, apparently ſucculent in its outer coat, which ſeems to be the caſe with the three preceding ſpecies. Gathered at King George's Sound, by Mr. Menzies. It is one of the handſomeſt of its genus. 12. C. *ſalignum.* Donn. Cant. 21. (Embothrium ſalignum. Andr. Repoſ. t. 215.) "Leaves linear-lanceolate, acute, without ſpines, ſingle-nerved. Capſules ovate, gibbous, recurved." Sm. MSS. A tall elegant ſhrub, with the habit of a willow. *Leaves* five or ſix inches long, ſmooth and pliable, of a narrow lanceolate form, entire, acute, but not ſpinous, with one nerve and a few lateral veins. *Flowers* copious, white, ſmooth, in ſmooth umbels, which, as in all the reſt of the genus, are axillary. *Capſule* ſmalliſh, ovate, recurved, very gibbous, and ſomewhat rugged, at each ſide, tapering at the baſe, externally hard and not ſucculent, each of its valves tipped with a lateral ſpine. A native of New South Wales, frequent in gardens.

Propagation and Culture. All the ſpecies are ſhrubby and perennial, eaſily raiſed from ſeeds brought in the capſules from their native country, and requiring with us only the uſual ſhelter of a green-houſe or conſervatory. Thoſe from King George's Sound are as yet ſtrangers to our gardens. The others thrive in ſandy peat earth, but require regular and rather copious ſupplies of water. They may be increaſed by cuttings. C. *ſalignum* ripens ſeeds in abundance when planted in the ground under glaſs, and riſes to the height of 12 or 15 feet. S.

CONCHOID, or CONCHILIS, in *Geometry*, a curve line which always approaches nearer a ſtraight line to which it is inclined, but never meets it. It was invented by Nicomedes, and much uſed by the ancients, as we learn from Pappus, in the conſtruction of ſolid problems.

It is deſcribed thus: draw a right line B D (*Plate, Analyſis, fig.* 2.) and another A C, perpendicular to it in E; draw any number of right lines, as C M, C M, cutting B D in Q; make $QM = QN = AE = EF$: the curve wherein the points, M, M, are found, is the *conchilis*, or *conchois prima*, ſo called by Nicomedes. The other, wherein the points, N, N, are found, is the *conchois ſecunda*; the right line B D the *rule*, or *directrix*, the point C the *pole*, or centre of the conchoid. In reality, they are both parts of the ſame curve, having the ſame pole C, and four infinite legs, to which the line B D is a common aſymptote. The inventor alſo contrived an inſtrument, whereby the firſt conchoid may be deſcribed mechanically: thus, in the rule A D (*fig.* 3.) is a channel or groove cut, ſo that a ſmooth nail, firmly fixed in the moveable rule C B, in the point F, may ſlide freely within it: into the rule E G is fixed another nail in K, for the moveable rule C B to ſlide upon. If then the rule B C be ſo moved, as that the nail F paſſes along the canal A D; the ſtyle, or point in C, will deſcribe the firſt conchoid.

Now let $AP = x$ (*fig.* 2.); $AE = a$; $PE = MR = a - x$; wherefore, as x increaſes, $a - x$, or M R will decreaſe; and therefore the curve continually approaches nearer to the rule B D.

In the ſame manner it appears, that the right line N O muſt continually decreaſe; and therefore that the ſecond conchoid, alſo, muſt continually approach nearer the rule.

But inaſmuch as between each conchoid and the right line B D, there will be the right line Q M or Q N, equal to A E; neither of the conchoids can concur with the right line B D: conſequently B D is an aſymptote of each conchoid. See ASYMPTOTE.

If from any point, A, of the curve (*fig.* 4.), A H and F T P be drawn perpendicular to the rule, or directrix, H T, and A L parallel to it; and if the quadrant, F G K, be deſcribed interſecting A L in G; we ſhall have $PL \times LG = TL \times LA$. For the triangles, A H B, T L G, are ſimilar and equal, as the angles at H and L are right; and $AB = TF = TG$, and $AH = TL$; therefore $BH = GL$. Alſo the triangles, A H B, A L P, are ſimilar. Whence $AH : HB :: PL : AL$; that is, $TL : GL :: PL : AL$; therefore, $PL \times GL = TL \times AL$. Hence, the ſame things being ſuppoſed, we ſhall have $AG = BT$, and $GL = HB$. For $AL = HT$, and $GL = HB$.

$= HB$; therefore, by ſubtraction, we ſhall have $AG = BT$. This propoſition is equally true in the inferior conchoid *(fig. 5.)*. In the inferior conchoid $gl = bh$. Moreover, in the ſuperior conchoid *(fig. 4.)*, if PTF and AH be perpendicular to the directrix HT, and AL parallel to it, $TL^2 : TF^2 - AH^2 :: PL^2 : AL^2$. For, by the preceding propoſition, $TL : GL :: PL : AL$, and $TL^2 : GL^2 :: PL^2 : AL^2$; but $GL^2 = GT^2 - TL^2 = TF^2 - AH^2$; therefore $TL^2 : TF^2 - AH^2 :: PL^2 : AL^2$.

Hence, putting $FT = a$, $PT = b$, axis $TH = x$, ordinate $HA = y$; the equation of the ſuperior conchoid will be $\frac{\overline{b+y}\sqrt{aa-yy}}{y} = x = AL$, or, by reducing it, we ſhall have $\overline{b+y}\sqrt{a^2-y^2} = yx$, i. e. $\sqrt{\overline{b^2+2by+y^2}\times\overline{a^2-y^2}} = yx$, or $\sqrt{a^2b^2+2a^2by+a^2y^2-b^2y^2-2by^3-y^4} = yx$, and $a^2b^2+2a^2by+a^2y^2-b^2y^2-2by^3-y^4 = y^2x^2$; whence, by tranſpoſition, we ſhall have $y^4+2by^3+b^2y^2-a^2y^2+x^2y^2-2a^2by = a^2b^2$, i. e. $y^4+2by^3+\overline{b^2-a^2+x^2}\times y^2-2a^2by = a^2b^2$. Thus alſo, in the inferior conchoid *(fig. 5.)*, if pft and ah be perpendicular to the directrix ht, and al parallel to it; we ſhall have $tl^2 : tf^2 - ah^2 :: Pl^2 : al^2$. For $tl : gl :: Pl : al$; and $tl^2 : gl^2 :: Pl^2 : al^2$: but $gl^2 = bh^2 = ba^2 - ah^2 = tf^2 - ah^2$; therefore $tl^2 : tf^2 - ah^2 :: Pl^2 : al^2$.

Hence putting $tf = a$, $tP = b$, axis $th = x$, ordinate $ha = y$, the equation of the inferior conchoid will be $\frac{\overline{b-y}\sqrt{a^2-y^2}}{y} = x = al$. And, when reduced, $y^4 - 2by^3 + \overline{bb-a^2+x^2}\times y^2 + 2a^2by = a^2b^2$. Or, it may be had from the equation of the other curve by merely changing the ſign of y, which in this caſe is negative.

Of the whole conchoid, expreſſed by theſe two equations, or rather by one equation only, with different ſigns, there are three caſes or ſpecies; as firſt, when EF is leſs than EC, as in *fig.* 2; when EF is equal to EC, as in *fig.* 6; and when EF is greater than EC, as in *fig.* 7, in which latter caſe the conchoid is called *nodated*. The ſame equation holds for this nodated conchoid, the whole difference being merely that a is here greater than b.

Sir Iſaac Newton approves of the uſe of the conchoid for triſecting angles, or finding two mean proportionals, or for conſtructing other ſolid problems. To this purpoſe, he ſays, in the linear conſtruction of equations towards the cloſe of his "Univerſal Arithmetic:" "The ancients at firſt endeavoured in vain at the triſection of an angle, and the finding of two mean proportionals by a right line and a circle. Afterwards they began to conſider ſeveral other lines, as the conchoid, the ciſſoid, and the conic ſections, and by ſome of theſe to ſolve theſe problems." Again, "Either, therefore, the trochoid is not to be admitted at all into geometry, or elſe, in the conſtruction of problems, it is to be preferred to all lines of a more difficult deſcription; and there is the ſame reaſon for other curves; for which reaſon we approve of the triſecting of an angle by a conchoid, which Archimedes in his Lemmas, and Pappus in his Collections, have preferred to the inventions of all others in this caſe; becauſe we ought either to exclude all lines, beſides the circle and right line, out of geometry, or admit them according to the ſimplicity of their deſcriptions, in which caſe the conchoid yields to none, except the circle." Laſtly, "that is *arithmetically* more ſimple which is determined by the more ſimple equations; but that is *geometrically* more ſimple which is determined by the more ſimple drawing of lines; and in geometry, that ought to be reckoned beſt, which is geometrically moſt ſimple; wherefore I ought not to be blamed, if, with that prince of mathematicians, Archimedes, and other ancients, I make uſe of the conchoid for the conſtruction of problems."

There will be other kinds of conchoids produced, if $CE : CQ :: QM : AE$; or indefinitely, if $CE^m : CQ^m :: QM^m : AE^m$: wherefore, if $CE = b$, $EA = a$, $CQ = x$, $QM = y$; then $ab = xy$; and for infinite conchoids, $a^m b^m = x^m y^m$.

CONCHOLOGY. "The ſtudy of ſhells, or teſtaceous animals," it has been well obſerved by a plain, but ingenious writer, "is a branch of natural hiſtory, though not greatly uſeful in human economy, yet perhaps by the infinite beauties of the ſubjects it treats of, is adapted to recreate the ſenſes, and inſenſibly lead the amazed admirer into the contemplation of the glory of the Divinity, in their creation." Or, in the more harmonious periods of the poet, we would ſay,

> "Each ſhell, each crawling inſect holds a rank
> Important, in the plan of him who framed
> This ſcale of beings;"———STILLINGFLEET.

Shells appear to form a part of the creation not immediately ſubſervient to the purpoſes of human life. This is granted; but they are a link in the great chain of nature; they conſtitute a department of rational inquiry worthy the reſearches of the man of ſcience; and when we conſider the amazing diverſity of ſingular and beautiful objects they embrace, are ſuch, we are perſuaded, as cannot fail to arreſt in a particular degree the regard of every common obſerver.

A late writer, whoſe talents we reſpect, aſſerts, in undiſguiſed terms, that the purſuits of the conchologiſt are frivolous, and tend to no uſeful purpoſe. For the credit of the philoſophical inquirer in this pleaſing department of natural knowledge, we could wiſh to ſee this opinion controverted. We ſhall not indeed endeavour to ſupport the pretenſions of conchology to a diſtinguiſhed rank among the more beneficial purſuits of ſcience, but we do not fear to prove it in a pre-eminent degree entitled to the attention of every contemplative mind. In the preſent enlightened period, it is not, we ſhould conceive, incumbent to offer any argument in its behalf, becauſe we are unable to prove its utility in the common acceptance of the term. We are not, for this reaſon alone, to eſteem it frivolous; or, in a word, to declare that our ideas are entirely abſorbed in the contemplation of intereſted views and the love of wealth, or that we are ſtudious only to gratify our immediate wants. Our untutored anceſtors cultivated the oak, we are told, that they might eat acorns, regardleſs of the importance of the parent timber; but we are not to imitate their example, and deem it trifling to cultivate any branch of natural ſcience, that is unlikely to afford us ſome direct benefit; nor are we to be content with aſcertaining what may be merely uſeful as food for ourſelves, or fodder for our cattle. How unworthy would this be of the refined conceptions and dignity of intellectual men? But we reſt convinced that a more enlarged and liberal idea of this ſubject will be conceived on the ſlighteſt reflection by every intelligent mind; that the ſcience of conchology will be hereafter more ſucceſsfully purſued in this country than it has hitherto been, and that the obſervations we have to offer as we proceed, though leſs abſtruſe than the ſcience may ſeem to demand, will to a certain extent facilitate this deſirable object.

One clear and moſt important fact, the truth of which we would wiſh to impreſs on the mind of the reader, ſhould be premiſed, that whatever opinion we may form on this ſubject,

ject, or however lightly we may be diſpoſed to appreciate its merits, the ſcience of conchology, or in more humble terms the ſtudy of ſhells, has in a greater or leſs degree attracted the attention of curious and contemplative minds throughout all ages; though, as may be naturally conceived, it has been cultivated with more ſucceſs in ſome periods than in others. The beauties of this part of the creation did not eſcape the obſervation of philoſophers in the firſt ages of learning, as appears obvious from the writings of Ariſtotle, of Pliny, and of Ælian, and we may alſo add of Athenæus and Cicero. The cultivation of this, like all other liberal ſtudies, was neglected in the darker æra that ſucceeded, or at leaſt no evidence to the contrary has ſurvived to this period; but in after ages, as the miſts of Gothic ignorance which had ſo long overhung the weſtern world diſperſed, and the light of ſcience, like the morning twilight, dawned upon the horizon of the human mind, conchology revived, was countenanced, encouraged, and flouriſhed. And if, in later times, it reſigned a precedence to other ſciences, in conformity to the example of the great Linnæus, who was perhaps leſs favourably inclined towards the ſtudy of ſhells than any other department of nature, it is pleaſing to add, that ſince his time this ſubject has been moſt aſſiduouſly cultivated, and that by writers no leſs eminently qualified to exalt its character than to give ſtability to the ſcience itſelf.

The term conchology comprehends the ſtudy of all animals which have a teſtaceous covering, whether inhabitants of the marine element, freſh water, or the land. Teſtaceology is a term ſynonymous with conchology, but is of later origin and application.

A preciſe diſtinction ſhould be drawn between teſtaceous and cruſtaceous animals; they are eſſentially different; though both are protected by a hard exterior ſhell or cruſt, in which they are partially or entirely enveloped; and have been indiſcriminately confounded together, for that reaſon, under the vague denomination of "ſhell-fiſh." Some of the old writers, and alſo Da Coſta, diſtinguiſh the teſtacea as a kind of ſtone-like calcareous covering or habitation, in which the animal, otherwiſe naked, reſides, and from which it can protrude its molluſcous arms, or other naked parts of its body, at pleaſure. The cruſtaceous animals of thoſe authors, on the contrary, are not naked, but have every particular limb or part ſeparately covered with the cruſt, which is thus divided into many joints, inſomuch that the whole animal aſſumes a loricated appearance, as if incloſed in a coat of mail. Among the cruſtaceous order, the *cancri*, or crabs and lobſters, were included, a tribe we have endeavoured to ſhew in another article, to be of a nature altogether diſtinct from teſtaceous animals. (See CANCER.) Klein, in his "Nat. Diſp. Echinodermatum," ſect. I. treats on this ſubject, and labours to prove that the echini, which are evidently cruſtaceous bodies, are of the ſame nature and quality as the teſtacea; but recent, and we think concluſive obſervations, teſtify the fallacy of his opinion. A better definition may be obtained by attending to the chemical properties of the two ſubſtances teſtaceous and cruſtaceous. Poli, in his work on the ſhells of the two Sicilies, demonſtrates that teſtaceous bodies conſiſt of calcareous earth united to a ſmall portion of animal matter or gluten; and Mr. Hatchett, whoſe experiments on the chemical characters of thoſe bodies are inſerted in the Tranſactions of the Royal Society, draws a ſtriking diſtinction from analyſis between the teſtaceous and cruſtaceous bodies, aſcertaining the firſt to conſiſt only of carbonate of lime mixed with gelatinous matter, while in the other the preſence of phoſphate of lime was detected. The cruſtaceous body analyſed by Mr. Hatchett was the echinus.

All teſtaceous animals are compoſed of two parts; one of which, the animal itſelf, is ſoft and molluſcous; the other is the ſhell, or habitation, which is hard, of a ſtony or calcareous nature, and either partially or entirely covers the animal. The animal is attached to the ſhell by means of ligaments or muſcles.

It was long conſidered as a matter of diſpute among naturaliſts, whether the arrangement of ſhells ſhould be conſtituted from the animals or their habitation. No one can deny, that if we proceed on principles ſtrictly ſcientific, we muſt regard them as a department of zoology, and ſhould, on that account, diſpoſe them according to the nature and ſtructure of the animals. But the claſſification formed from the characters of the ſhells is univerſally followed, and we muſt confeſs too, is for many reaſons preferable to any other. Neither is it, in the hands of the ſkilful conchologiſt, attended with ſo much indeciſion, as might be generally imagined.

In the firſt place among the vaſt variety of ſhells hitherto diſcovered, how ſmall comparatively is the number of thoſe, whoſe animal inhabitant is deſcribed or known. It is not of ſpecies only that we ſpeak, but of whole natural families or genera, not a ſingle ſpecies of which has been yet diſcovered with the animal appertaining, ſo little are we acquainted with the molluſcous orders, or animals inhabiting the ſhells. Of the ſhells we daily ſee in collections few are fiſhed up alive, the far greater number are found on ſhores, dead or empty. Neither, if it were otherwiſe, are accurate deſcriptions of animals whoſe parts are not eaſily ſeen, or anatomical inveſtigations, which are in many caſes neceſſary, within the capacity of every one. Many of their parts, and their reſpective functions, are not to be aſcertained, except by comparative analogy, and which in itſelf preſents an inſurmountable difficulty, or a field of critical inquiry ſo extenſive and complicated that few, even with the ability to purſue it with ſucceſs, could be prevailed upon to devote that attention to the ſubject which it requires.

Hence it becomes impoſſible to arrange the far greater number of teſtaceous productions by the animals; the attempt muſt ever prove unſucceſsful. Our arrangements would be partial, and three-fourths of the ſhells known muſt be either excluded from the ſyſtem, or be placed at hazard; and of courſe without order or connection with thoſe whoſe animals we are acquainted with. The latter are chiefly ſuch as are confined to the coaſts of the European ſeas, and ſome of the terreſtrial and freſh water kinds, which, from their abundance and locality, have obtruded themſelves upon the inveſtigations of the naturaliſt. Even our knowledge of thoſe is exceedingly imperfect. For thoſe of the extra European ſpecies, we are indebted chiefly to Adanſon, Rumphius, Argenville, and Favanné, and for the anatomical diſcuſſions on various European kinds to Valentini, De Heide, Liſter, and Müller. The inveſtigations of Poli on the ſhells of the two Sicilies are valuable, in this reſpect, as alſo are the obſervations of Lamarck, and Cuvier, and we may alſo add Olivier; but what is the amount of all theſe diſcoveries, we would aſk, in enabling us to form a ſyſtem of conchology.

The beſt characters upon which to found all ſyſtems of natural hiſtory, muſt be thoſe moſt obvious and acceſſible. All ranks of animals, as nearly as can be with convenience, ſhould be arranged by apparent and external characters. While we ſtudy ſhells, without regarding the animal, we are aware they are but conſidered partially. The animals that inhabit them ſhould guide us in our reſearches; they alone are the fabricators of the ſhell, and the ſhell is only their habitation, to which they give the form, the bulk, hardneſs, colours, and all the peculiarities of elegance we admire. If we were to examine theſe new and almoſt unknown beings, we ſhould diſcover a number of parts as remarkable for their ſtructure as their functions, and an infinite variety of curious and intereſting particulars relative to their general habits and manners of life. It is a ſubject worthy of the ſerious contemplation and attention of the naturaliſt, and ſhould never be neglected when an opportunity offers. But a ſyſtem of conchology, founded entirely on the ſtructure of the animals, muſt, we cannot heſitate in aſſerting, ever remain one of the deſiderata of natural ſcience.

In the ſuperficial arrangement taken from ſhells alone we are not exempt from difficulty. Shells vary exceedingly in form and colour in the different ſtages of their growth, and in this caſe we ſhould ſometimes derive material aſſiſtance from our knowledge of the animal. Young ſhells have been deſcribed as ſpecifically diſtinct from the parent or older ſhells by many writers. It indeed requires a greater degree of caution in determining the ſpecies, nay even genera, of ſhells in the different periods of growth than may be imagined; of this we could adduce many very remarkable inſtances, a few it may be neceſſary to mention to guard the common obſerver from forming haſty, and erroneous concluſions.

Many of the cyprææ, or cowries, when young, have the appearance of a volute, the thick denticulated fold of the exterior lip being wholly wanting, and the column being only partially plaited as in the true voluta. The young of the alated ſhells, in general, are deſtitute of that broad expanſive, or furcated lip, called the wing. The ſpires in many of the turrited kinds of ſhells, when young, are blunt; obtuſe, or terminated in a large globular head, exceeding the ſize of the whorl beneath, but as the ſhell advances in growth, it developes itſelf, extending in a ſpiral direction, and thus in the old ſhells the number of ſpires is greater than in the young ones. The variations in the growth of the patella tribe are often ſo conſiderable, as to almoſt defy the critical obſerver to determine them. Still however the conchologiſt by the dint of application, and nice diſcrimination, will be at laſt enabled to fix on certain characters peculiar to every ſpecies, and be, by that means, enabled to decide on the ſpecies of a ſhell under every ſtage of growth.

Linnæus conſiders the ſtructure of the animal as well as the ſhell in all his generical diſtinctions; the idea is excellent, and we ſhould approve the deſign, but the object itſelf is unattainable; a lamentable proof of which preſents itſelf to view, when we conſider the number of thoſe very animals which he deſcribes that have been aſcertained, by recent obſervations, to be of a very different nature and ſtructure from what he conceived. This error may be eaſily accounted for when we reflect that the judgment of Linnæus was guided in many inſtances by analogy, and the indifferent figures extant in various writers, without himſelf poſſeſſing the means of determining their accuracy, or imperfection. We intend nothing to the diſparagement of Linnæus in this reſpect; the ſtructure of the animal was of too much importance in his mind to be omitted, and he availed himſelf of the beſt ſources of authority within his power, ſome of which, it has ſince been proved, are not ſo accurate as we could wiſh, and others altogether erroneous.

From all that has been advanced on this topic, the reſult will be obvious, that teſtaceous bodies may be conſiſtently arranged, or, in other words, can only be arranged by the organization of the ſhell; that the primary character muſt be taken from the ſhell becauſe this we are acquainted with, while the animal is oftentimes unknown to us. But that the ſtructure of the animal ſhould be regarded in the conſtruction of genera, when it can be aſcertained; as a ſecondary conſideration to guide us in the formation of new genera, or in correcting the old, as opportunities of inveſtigating them occur.

Having defined the meaning of a teſtaceous animal, and endeavoured to prove that the ſtructure of the ſhell is the moſt material object to be regarded in a primary view, we ſhall proceed next to an elementary elucidation of the ſeveral parts of which it is compoſed.

In conchology, as in any other ſcience, the ſtudent muſt neceſſarily acquire, in the firſt inſtance, a diſtinct knowledge of the terms employed. Theſe, except ſuch as relate to ſubordinate characters, or ſpecifical diſtinctions, and which require no explanation in this place, may be ſimplified and reduced to a ſmall number. In the ſelection of theſe terms we can abide by no one particular authority; we muſt be general, deriving our terms from various ſources, or inventing new ones. Hitherto in treating on the different articles of conchology, in the progreſs of this work, it has been our aim to adhere as nearly to the authority of Linnæus as poſſible, reſerving to ourſelves an opportunity of expreſſing our own ſentiments under the preſent article, and ſtating generally theſe points upon which we principally differ in opinion from that author. This will appear more fully in our review of his genera. Our attention is at this time confined to the terms employed in deſcribing the ſeveral parts of ſhells, and as it is well known that Linnæus laid down a ſeries of terms for this purpoſe, it will be expected that we ſhould not paſs over them in ſilence. Upon this ſubject we ſhall however only treſpaſs lightly. We would willingly adopt thoſe eſtabliſhed by Linnæus, in his "Fundamenta Teſtaceologiæ," and other writings; but it muſt be confeſſed, with all our reſpect for the talents of that naturaliſt, his terms are inadmiſſible. The warmeſt of his admirers, and we muſt, on many occaſions, profeſs ourſelves of that number, will not peruſe the definitions he has given of the bivalves, of his venus, and ſome other bivalve genera, of his venus dione, and alſo of ſeveral univalves, without admitting that much of the Linnæan phraſeology on this ſubject is neither applicable to the parts intended, nor if it were, ſuch as modeſty would allow us to retain; and that to expunge them is only a neceſſary ſacrifice which the chaſtity of ſcience imperiouſly demands. Delicacy will pardon the alluſion, and deſire no further explanation.

All ſhells or teſtaceous bodies hitherto diſcovered, may be divided into three principal tribes, and which, after the Linnæan manner, may be denominated Multivalve, Bivalve, and Univalve.

Any external part of a ſhell being of a teſtaceous ſubſtance, and either itſelf, forming a ſhield or covering for the animal, as in univalves, or in union with another, or others connected by a ligament, cartilage, hinge, teeth, or other faſtening, is denominated a valve. The ſhells therefore conſiſting of a ſingle piece, are called univalves, thoſe of two parts bivalves, and thoſe of many parts multivalves. Between bivalve and multivalve no diſtinction is drawn, ſhells conſiſting of more than two ſuch parts, being called multivalve, without any regard to the number. An amendment is propoſed by ſome of the French writers, in a new order under the name of trivalve.

Shells of the ſimpleſt form are arranged by ſome naturaliſts in the firſt claſs, from which they proceed progreſſively to thoſe poſſeſſing the greateſt number of valves, and being of the moſt intricate ſtructure. This is an ancient, and very ſimple mode of arrangement, and has its advocates in the preſent day. Linnæus reverſes this order by beginning with the chiton, lepas, and pholas, which are ſhells of the multivalve and moſt complex ſtructure, and ending with thoſe of the ſimpleſt form. We cannot avoid thinking the former preferable, and ſhall adopt it in the preſent inſtance.

Explanation of the Parts of Shells with Reference to the Elementary Plates of Conchology.

Univalve.

In the examination of a ſhell of this order, the contour, or outline, is the firſt particular to be regarded. By this the conchologiſt is guided in his definition of ſimple, ſpiral, or turbinated ſhells, (or as the Linnæan ſchool divides ſhells, univalves with a regular ſpire, and univalves without a regular ſpire); diſcoid, flattened, or turrited ſhells; thoſe with ſmooth or uneven *anfractus*; the ventricoſe, alated, labiated, roſtrated, and many other diſtinctions, all which ſtrike the eye at the firſt view. It is indeed, by attending to the contour, that the principal diſtinctions in ſhells of this kind are at once perceived, taking into conſideration the back and front profile at the ſame time. Some few ſhells, as the nautilus pompilius, and others of the ſame family, have the ſpire revolving internally, in which the outline offers leſs aſſiſtance in the primary definitions, but the number of ſuch ſhells is very ſmall. Next to the profile of the ſhell, the ſtructure of the mouth, the pillar, and expanſion of the inner lip, the gutter or canaliculation, and the umbilical opening, and operculum if any, are to be conſidered, and laſtly the work on the outer ſurface, as well as the colours with which it is embelliſhed.

The baſe or bottom of the ſhell we conſider that part upon which it reſts when ſupported in an erect poſition, with the ſummit or tip of the ſpire ſtanding vertically. In ſuch ſhells the tip is called the apex. The courſe of the ſpires or wreaths is from the left to right in moſt ſpiral ſhells, ſome few only being of the reverſed or heteroſtrophous kind, the whorls of which are in a contrary direction. When ſpeaking of the right and left ſides of a ſhell, it ſhould be underſtood as having the aperture downwards, and it will be then ſeen that in moſt ſhells the aperture or opening is on the left ſide, *i. e.* facing the right hand of the ſpectator.

Baſe, the tip of the ſalient end of the ſhell, at the extremity oppoſite the apex of the ſpire; in the roſtrated kind of univalves it implies the tip of the beak. Some ſay the ſhell reſts on its baſe when laid upon a flat ſurface, with the mouth downwards; this is not correct, except in the patella tribe, and ſome other univalves which have no regular ſpire, as the dentalium, &c. The baſe in ſeveral ſhells is denoted in the Plate, *Conchology*, *fig.* 1.

Apex, the ſummit of the ſhell. *Fig.* 2.

Front, the face of the ſhell with the aperture placed directly in front of the obſerver. *Fig.* 3.

Back, that part of the ſhell which is immediately oppoſed to the preceding. *Fig.* 4.

Sides, thoſe parts ſeen longitudinally in profile, to the right and left when the ſhell is viewed either in a front or back poſition. *Fig.* 5.

Body, of the ſhell, (corpus) the firſt whorl of the ſpire at the baſe. *Fig.* 6.

Belly, is to be diſtinguiſhed from the body as it implies only the convex or ſwollen part of the firſt whorl, formed by the convexity of the aperture near the lip. *Fig.* 7.

Whorl denotes one of the wreaths, turns, or volutions of the ſhell. *Fig.* 8.

Spire, comprehends, in a general ſenſe, all the whorls of the ſhell, the firſt or body wreath excepted. *Fig.* 9.

The form of the ſpire is of great conſideration in the definition of ſhells as it affords a prominent and diſtinguiſhed character; it is in general flattiſh, ſomewhat depreſſed or elevated; ſometimes convex and ſlightly pointed; or with the point obtuſe; or much elevated and ending in a point; plano-concave, pyramidal, ſubulate, or truncated. Mr. Adanſon obſerves that the diſpoſition of the ſpires varies according to the plane they turn on, which is either horizontal, cylindrical, conic, or ovoid. Theſe, he conceives to be the four principal diſpoſitions of the ſpires, but admits there are many intermediate formations. The number and form of the ſpires vary in the ſame ſpecies, in their different growths. Young ſhells have commonly a leſs number than the old ones, neither have ſhells of the ſame age always the like number of ſpires, a circumſtance attributable to the effects of ſickneſs, or the difference of ſex. Thus in ſome turbinated ſhells we perceive that the males have the ſpires leſs numerous, ſmaller, and of a more lengthened form than in the females.

Suture of the ſpire or whorls, is the ſpiral line which ſeparates the whorls, and which is ſometimes ſulcated, crenulated, or ſomewhat projecting. *Fig.* 10.

Pillar or Columella, is the inner part of the left lip, or column, which runs through the ſhell, from the lower extremity to the tip of the ſpire, and from which all the ſpires take their origin; the columella being ſituated as nearly as poſſible in the axis of the ſhell, and ſerving as its baſis and ſupport throughout. It is generally either flat, grooved, folded, or truncated in that part which is viſible at the opening. *Fig.* 11.

Aperture, called in familiar language, the mouth of the ſhell, is the entrance to the chamber in which the animal reſides, and is applicable to the openings of univalve and multivalve ſhells. The aperture is either entirely open, or cloſed by the operculum attached to the body of the animal, when the animal retires into its dwelling. This aperture varies in form in different ſhells, being angular, rounded, ſemilunar, linear, or otherwiſe, and ſometimes appears double, the inner margin being ſurrounded by an exterior one. *Fig.* 12.

Lip, the expanſion of the exterior part of the aperture conſtitutes the lip in the labiated ſhells, and the wing in the alated kinds. *Fig.* 13.

Beak, or roſtrum, is that part at the baſe which extends in a ſtraight or ſlightly oblique direction from the bottom of the aperture, and is larger or ſmaller in different families. In murex hauſtellum this projection is very conſpicuous. *Fig.* 14.

Canal, or gutter, an elongation of the aperture of the ſhell deſcending in a groove or gutter-like proceſs. Some kinds of roſtrated ſhells have the canal remarkably conſpicuous, forming a ſinus from the aperture throughout the whole length of the beak. *Fig.* 15.

Umbilicus is the opening, or perforation in the lower part of the body, or firſt whorl of many ſpiral univalves, and is very conſpicuous in a number of the trochus and nerita genus in particular. This umbilical perforation runs in a ſtraight line from the baſe to the ſummit of the ſhell, forming throughout a ſpiral groove or gutter, which is wide at the entrance, and tapers gradually towards the apex. In the Linnæan nerita canrena, the ſtructure of the umbilicus is well diſplayed, but is ſtill more obvious in the ſtaircaſe ſhell, trochus perſpectivus. This opening occurs in many ſhells at the baſe of the pillar. *Fig.* 17.

The umbilicus is either ſmooth, carinated, crenulated, or beſet with tubercles, and ſometimes denticulated. It is either entirely, or only partially diſcloſed, being ſometimes half cloſed up by a gibboſity, or other projection at the aperture, in which caſe it is termed by conchologiſts ſemi-umbilicated, or ſub-umbilicated. Sometimes the pillar ſpreads ſo far over as nearly to cloſe up the entrance.

A ſhell without an umbilicus is termed imperforate; ſometimes the term imperforate implies that it has neither umbilicus, nor caniculation at the baſe.

Operculum is a teſtaceous or cartilaginous appendage peculiar in a conſiderable degree to the univalve tribe of ſhells, and thoſe only of the ſpiral or turbinated kinds. This appendage is not connected with the ſhell, but the animal, and ſerves like a lid or little door, to protect or cloſe up the aperture of the chamber when the creature retires within its habitation. Shells of this kind are diſtinguiſhed by the name of *cochleæ operculatæ*, by ſome of the elder conchologiſts. The opercula are often ſmall in compariſon to the ſize of the ſhell to which they belong; their form various in different ſpecies; and their ſubſtance in ſome of a horny texture, and, in others, teſtaceous or approaching the nature of ſtone. Their figure in common is either perfectly round, elliptical, oval, or elongated, and ſometimes wrought with ſpiral work, or concentric lines.

The operculum is commonly adherent either to the upper part of the poſterior end of the foot, or, as denominated by ſome writers, the pedeſtal of the animal, or at its extremity, ſo that when the animal moves along, the operculum appears at a diſtance from the ſhell. In the neritæ, ſome of the turbines, and certain other kinds, which have the aperture of a round, ſemicircular, or oval form, the operculum is uſually of a ſize adapted to the extreme circumference of the opening, or nearly ſo, and fits cloſe at the entrance; or is very little drawn into the opening when the animal retreats into its chamber. On the contrary, in the volutæ and ſome other ſhells which have the mouth of a lengthened or linear form, the aperture is comparatively very ſmall, and the operculum might be drawn far into the ſhell, when the animal retreats into its ſpiral receſs before the channel becomes ſufficiently contracted to be completely cloſed up by this appendage.

The teſtaceous opercula eaſily diſſolve in acids; it therefore happens that when put into vinegar they move briſkly to and fro for ſome time, by the ebullition, hence they have obtained the name of creeping ſtones among the common people. The cartilaginous opercula are not affected by this proceſs. The blatta byzantia, of medical writers, are of this latter kind; being the true opercula of two or three different kinds of ſhells, very abundant in Paleſtine, and other parts of the eaſtern world.

Some of the ſpiral, or turbinated land ſhells, are likewiſe of the operculated kinds, but differ from the foregoing, as they form a new lid, or operculum, every year, or oftener, eſpecially at the approach of winter, when the animal is prompted to make this proviſion, in order to guard itſelf from the inclemencies of the weather. It is formed by a viſcous moiſture emitted from the body of the animal, and which condenſes into a kind of tough coriaceous ſubſtance of pretty conſiderable thickneſs; this covering is never attached to the body of the animal; it merely covers the entrance, nor is it ever wrought like the true opercula of marine ſhells with ſpiral or concentric lines.

Operculated ſhells are chiefly the turbinated kinds of univalves; the opercula of the balani among the multivalve ſhells conſiſt of four pieces, and partake rather of the nature of valves, both in ſubſtance and appearance, than of the opercula above deſcribed.

Involuted ſpire, revolved ſhells (univalvia turbinata claviculæ intus reconditæ, &c. Da Coſta). Theſe ſhells turn or revolve inſide, or have the whorls concealed within the body of the ſhell as the nautilus and cypræa. An involuted ſpire is ſhewn at *fig.* 18.

Chambers are the ſpaces or diviſions formed in the interior part of ſhells by intervening partitions, a kind of articulated ſtructure elucidated completely in the nautilus.—By a chambered ſhell we ſometimes underſtand only that it has ſome laminiform, ſubſpiral, or other proceſs within, as in patella Chinenſis. *Fig.* 19.

Siphunculus, the ſmall canal which penetrates in a ſpiral direction through the chambers of the nautili. An organ of this nature is obſervable alſo in the ammonitæ. *Fig.* 20.

Epidermis is a kind of ſkin or coating, with which the exterior ſurfaces of many ſhells, both of the univalve and bivalve tribe, are covered. It is conſidered as a ſort of perioſteum or membrane, deſigned by nature to defend the ſhell from accidents and aid their growth, and to prevent other teſtaceous or marine animals from fixing their habitations on theſe ſhells, as they do upon moſt bodies in the ſea, where there is no power of reſiſtance. The epidermis is a genuine covering formed by the animal itſelf, peculiar to ſome kinds, and as conſtantly never obſerved on others. There is no doubt but the animal to which this ſort of covering is peculiar, poſſeſſes a proper apparatus for its conſtruction. The ſtructure of this epidermis, it ſhould be added, is very diſtinct in different ſhells, conſiſting in ſome of a very thin pellucid film, and in others laminated, pilous, velvetty, fibrous, or rugged. Few ſhells, having a rugoſe ſurface, are deſtitute of this external covering or epidermis.

The ſpines, protuberances, longitudinal ridges, carinations, furrows, ſtriations, punctations, granulations, and other peculiarities of what is termed the "outſide work" of the ſhells, are to be regarded only as ſpecifical diſtinctions of ſhells; and the variegations of colours, ſpots, and other ſimilar particulars, are to be conſidered in the ſame point of view. Thoſe peculiarities are not obſervable in many ſhells in their natural ſtate, being concealed beneath the thick epidermis which inveſts them; in others which have the epidermis thin and membranaceous, they are perceptible, but the beauty of the ſhell is diſcloſed only upon removing this exterior covering. See *fig.* 21.

Bivalves,

Or ſhells of two valves united by means of a cartilage, hinge, connection of the teeth, or other proceſs. In order to conſtitute a bivalve ſhell, it is only requiſite that it be furniſhed with two connected valves, without regard to their reſemblance in form or dimenſions. Some of the bivalves have both valves formed alike; in others they differ only in a ſlight degree, and again in others they are altogether diſſimilar. The firſt of theſe is well exemplified by the ſolen genus; in that of the Linnæan tellinæ, we find examples both of the equivalve ſhells, and thoſe with the valves ſlightly different: of the laſt-mentioned kinds we have many, as the oſtrea, ſpondylus, and anomia. Bivalve ſhells are often much compreſſed, ſome are gibbous, and when viewed at the ſide, or facing the ligament, have a cordated appearance, as in venus, and the Linnæan chama cor. Shells, having both valves alike, as before obſerved, are called equivalve. Equilateral valves imply thoſe which have both ſides of the ſame valve alike, as for inſtance, when a longitudinal line is drawn from the beak to the oppoſite margin, the ſpace on each ſide the line is diſtinguiſhed by the appellation of the right and left ſide; and when the form of both thoſe ſpaces correſpond, the ſhell is equilateral, as in the ſcallops (oſtrea, Linn.): the inequilateral valves are the reverſe of this, a line drawn as above deſcribed, from the beak to the oppoſite margin, preſenting two ſides of a very different ſhape, as we ſee in moſt of the mactra, the donax, and tellina genera, and in the mya truncata eſpecially. Subequilateral ſhells, or thoſe having the valves nearly equal at both ſides, are ſufficiently elucidated by ſhells of the cardium, or cockle genus, which are ſtrictly "bivalvis ſubæquilatera."

All bivalve ſhells do not completely cloſe their ſhells, though moſt of thoſe before mentioned do ſo, ſuch as the ſcallop, the donax, tellina, and cardium: in ſeveral other tribes of bivalves, when the ſhells are ſhut as cloſely as their form will allow, they ſtill exhibit a kind of hiatus or gaping, either at the anterior or poſterior end, or at both; and in ſome, when the valves are ſhut, both the anterior and poſterior parts are cloſed, but an opening appears on one ſide of the beak; this laſt-mentioned character is very obvious in chama gigas.

One of the firſt circumſtances to be conſidered, is which part of a bivalve ſhell ought to be deemed the baſe, becauſe when this is determined, every other part will fall progreſſively in their relative order under our obſervation. We name that part of the margin or limb which is ſituated in a direct line oppoſite the beak, the baſe of the ſhell. Linnæus, in order to eſtabliſh the characters, and afford ſome apparent reaſon at leaſt for the application of the terms he beſtows on the different parts of bivalves, reverſes this poſition of the ſhell, and deſcribes the beaks as the baſe of the ſhell. But the fact is, the natural poſition of the ſhell is in immediate contradiction to his axiom, for the beaks are always uppermoſt, being either immediately vertical, or with a ſlight inclination obliquely, when the animal moves along with its teſtaceous covering on the back. A ſolitary example will perhaps occur occaſionally, in which the beaks may be conſiderably inclined when the animal crawls, but none, we believe, are known which open the valves upwards, and proceed with the beaks under the body. The beaks, if only for this reaſon, are to be conſidered as the ſummit, and the margin oppoſite as the baſe. Many of the bivalves are deſtitute of the locomotive power, or at leaſt do not poſſeſs it in any material degree.

Baſe of bivalve ſhells, exemplified in venus verrucoſa. *Fig.* 22.

Summit, a word applied in a general manner to the top or moſt elevated part of the two protuberances obſervable in the greater number of bivalves. Da Coſta calls that part of the ſhell, in which the teeth or hinge is placed, the ſummit or apex; we regard it as the moſt elevated part of the beaks. *Fig.* 23.

Beak, the pointed termination, apex, or tip of the protuberances laſt-mentioned, and which, in many ſhells, turn ſpirally downwards, or obliquely, ſo that the beak itſelf is ſeldom the moſt elevated part of the ſhell; though it is ſo ſometimes, as for inſtance in the mytilus edulis, or common muſcle. *Fig.* 24.

Sides, the lateral parts of the valves diſtinguiſhed by the epithet of right and left ſide; in common language, the two valves of a ſhell are called the ſides, but it is not underſtood as a term in conchology in this view. *Fig.* 25.

Margin, or *limb*, the whole circumference or outline of the ſhell, when laid flat down on one valve. *Fig.* 26.

Diſk, the convex centre of each valve, or exterior ſurface *Fig.* 27.

Anterior ſlope, that part of the ſhell in which the ligament is ſituated; in the front view of the anterior ſlope, the beaks fall back, or behind. *Fig.* 28.

Poſterior ſlope, that immediately oppoſed to the former, and in which the beaks of the ſhell turn forward. *Fig.* 29.

Lunule, the lunulated depreſſion below the beaks, either on the anterior or poſterior ſlope, and ſometimes on both; they may be diſtinguiſhed under the appellation of anterior or poſterior lunules, according to the ſlope in which they are ſituated. *Fig.* 30, ***a***, ***b***.

Cartilage of the hinge, called alſo the ligament of the hinge, the ſubſtance of a flexible, fibrous, and ſomewhat horny nature, by means of which, the two valves are united near the beak. *Fig.* 31.

Ears, the lateral proceſſes near the beaks, as in the ſcallop tribe: thoſe occur either on one ſide, or on both. *Fig.* 32.

Ligament perforation, the opening, or aperture, through which the ligature of the animal paſſes in the anomia genus, by the aſſiſtance of which it faſtens itſelf to the rocks, or other bodies; in ſome it is ſituated in the flat valve, in others at the beak of the gibbous valve. *Fig.* 33.

Length and breadth of the ſhell. The length is meaſured from the cartilage or beak to the margin below, the breadth is of courſe taken in the oppoſite direction. The breadth of many bivalve ſhells exceeds their length: ſome remarkable inſtances of which occur in the ſolen tribe. *Fig.* 34.

Inſide of the valves exhibits the concave ſurface (*concavitas concharum*), *fig.* 35.

Hinge, the point of union between the two valves, formed by the connection or articulation of the teeth in both valves, or by the teeth in one valve, fitting into hollows or ſockets in the valve oppoſite. The amazing variety of ſtructure obſervable in the hinge of different tribes of ſhells renders this one of the moſt eſſential characters in the generical definitions of ſhells. The teeth in ſome are ſmall and numerous, in others thick, ſolid, and few in number, or ſometimes ſingle, long, ſpatuliform, laminiform, acicular, &c. the principal of which may be divided into *inarticulate* hinge, when only furniſhed with calloſities, or having no viſible teeth; *articulate*, when it has teeth, but only a ſmall number; and *multarticulate*, when the teeth are numerous. Theſe variations will be further explained under the reſpective genera.

Cicatrix, the impreſſion on the inſide of the valves indicating the point of connexion between the muſcles of the animal, and its ſhell. In ſome kinds, as the common oyſter for example, there is only one ſuch muſcular impreſſion in each valve, in others there are two, and ſome have more. The cicatrix is not of the ſame figure in all ſhells, being either round, ſemi-ovate, lunate, or elongated, in different kinds. *Fig.* 37.

Byſſus, the appendage called the beard; by means of which ſome bivalves faſten themſelves to the rocks. *Fig.* 38.

The imbrications, furrows, ſpines, tubercles, reticulations, ſtriations, or other peculiaritis of the ſame nature, as well as the variations of colours, obſervable on the exterior ſurface of bivalves as before ſtated in ſpeaking of univalves (and which is indeed equally applicable to the multivalves, and conſequently to ſhells of every deſcription), though they afford us the beſt ſpecifical diſtinctions poſſible, do not claim our regard as primary characters, and are therefore paſſed unnoticed in this place.

Multivalves.

The ſhells of this order are few, compared with either of the preceding; and the terms propoſed for thoſe, are applicable for the moſt part to the multivalves. The following require more explicit mention.

Baſe, that part of the ſhell upon which it reſts: in the lepas tribe it implies the part immediately ſeated upon the ſtem or pedicle; in the balani, the baſe is generally larger than the ſummit, and is the bottom by means of which the ſhell is fixed upon the rocks, or other extraneous bodies. *Fig.* 39.

Ligament, the ſubſtance, whether membranaceous or tendinous, which ſerves to connect the valves together. The connexion of the valves in ſome multivalves is formed by the parts of one valve locking into another. *Fig.* 40.

Operculum. The balani have the aperture at the ſummit cloſed by means of four ſmall pieces or valves, which are commonly called the operculum; theſe opercula of the balani are, however, very different from thoſe of univalve ſhells. *Fig.* 41.

The various parts of which teſtaceous bodies conſiſt being ſufficiently conſidered and explained, our attention is next directed to the different modes of arrangement into which thoſe bodies have been diſtributed by the principal writers on conchology, and a general inquiry into a variety of other particulars connected with the hiſtory of the ſcience. In this inveſtigation we ſhall avail ourſelves in ſome meaſure of the method pointed out by the learned author of the "Claſſes Conchyliorum" (Bergen), the valuable "Bibliotheca Hiſt. Natur. Bankſiana" of Mr. Dryander; "La Conchologie" of Favanne; the "Hiſtorical Account of Teſtaceological writers," by Dr. Maton and Mr. Rackett, inſerted in the "Tranſactions of the Linnæan Society," and the labours of many others, in addition to our own, as will appear in the courſe of the following obſervations.

The name of Ariſtotle ſtands high in the records of philoſophy. He is emphatically called by Dr. Pultney, in ſpeaking of teſtaceological writers, the father of natural ſcience; and by Dr. Maton the inventor of ſyſtem. Our reſpect for the Macedonian philoſopher is great, nor would we willingly appear to detract from his diſtinguiſhed merit; yet we muſt confeſs we never could conceive it poſſible, with all the ability this early writer poſſeſſed, that, riſing as it were from primæval darkneſs, he could at once ſurvey the multifarious objects of creation, and produce a ſyſtem of natural objects ſo complete as that which we are diſpoſed to acknowledge excluſively as his own. He muſt have derived conſiderable aid from ſources then extant, and which are now for ever loſt to the world. The hiſtory of mankind throughout all ages will teſtify beyond a doubt that the acquirement of human knowledge is ſlow and progreſſive; and the knowledge of Ariſtotle in natural ſcience was in particular of that kind which in a great meaſure could be attained only from the obſervations of many. Under the patronage of Philip, the Macedonian monarch, and of his ſon Alexander, the hero of the world, no advantages which Ariſtotle could derive from the ſtudy of books would be denied him, and can it be imagined from ſo many hundred thouſand volumes as were extant in his time, and at his immediate command, Ariſtotle was unable to obtain information; or that among this immenſe number there were none on the ſubject of Ariſtotle's inquiries? This writer would certainly avail himſelf of the recorded labours and diſcoveries of former ages, and eſpecially would not neglect to cultivate an acquaintance with the ſciences of the Egyptians, upon all which his own ideas might improve. Indeed, if we miſtake not, however viſionary it may appear, the latter was the genuine ſource from whence his knowledge of natural philoſophy was derived. Egypt, not Attica, was the cradle of ſcience.

To the writings of Ariſtotle the learned world is certainly indebted for the firſt account we probably ever may poſſeſs of the ſtate of natural ſcience at the early period in which he lived; it is a fortunate circumſtance for the cauſe of learning that his labours have ſurvived the havoc of deſtructive time. This ſyſtem is a production that would confer credit on any naturaliſt of the fourteenth century, much leſs of a period almoſt two thouſand years before. The claſſification, or diviſion of ſhells contained in the fourth book of "Ariſtotle's Hiſtory of Animals," has ſtood the teſt of ages, and, with improvements, rendered neceſſary by recent diſcoveries, is in general adopted by very late writers. Linnæus was in a great meaſure himſelf indebted to his ſyſtem for the outlines of his own, for many of his genera, and for the names under which thoſe genera are retained, even in the moſt improved ſtate of his "Syſtem of Teſtaceology."

The "Oſtracodermata" of Ariſtotle, for ſuch is the title of his conchological productions, preſent us with a valuable ſcheme of ſhells. He divides all ſhells into two principal claſſes, Μονόθυρα and Δίθυρα, or univalves and bivalves.

The univalves he ſeparates into two parts; namely, thoſe of the turbinated kind, as Κοχλιαι, or *limaces*, Κωκάλια, *cocalia*, the *purpuræ*, Πορφύραι, *buccina*, Κήρικες, &c.; and ſuch as are leſs turbinated, as Λεπὰς, the ſea-ears, or haliotis, and Νηρῖται, *neritæ*. Among the latter, he includes ſeveral families of the echinus, or ſea-eggs, Εχινος, a tribe of cruſtaceous animals retained by almoſt every writer among the ſhells, till they were ſeparated by Linnæus. He alſo ſpeaks of the animals inhabiting the cocalia, purpureæ, and buccina.

The bivalves he diſtributes into ſeveral families; he has Κτένες, or *pectines*, Σωληνε, *ſolenes*, and Πίννα, *pinnæ* or ſea-hams, all of which genera have been retained by Linnæus, and later authors.

Ariſtotle commits one remarkable error, however, in placing the opercula of ſome turbinated univalves as a genuine tribe of ſhells. This error, which indeed we think excuſable conſidering the age in which that philoſopher lived, is mentioned by ſeveral authors as an objection to his accuracy of diſcrimination, and is commented on by Bergen in the following obſervation.

"Ex umbilicis τοῖς κόχλοις videtur Ariſtoteles peculiare conchyliorum genus perperam conſtituiſſe, ſunt enim proprie opercula quorumdam turbinatorum, quæ certo anni tempore foribus cochlearum quaſi inſtar clauſtri agglutina inveniuntur quæque poſtea decidunt & nullius amplius uſus pro ipſo animalculo." Ariſtotle flouriſhed 322 years before Chriſt.

C. S. Pliny wrote largely upon conchology; the ninth book of his "Hiſtory of Animals" is very copious: it is more diffuſe than that of Ariſtotle, and the arrangement is unmethodical, but this is ſtill an uſeful work, and may be conſulted with advantage. Many of the terms employed by modern conchologiſts are to be found in his work. Pliny conſtitutes thirty-three families, which are diſtinguiſhed chiefly by the form and ſuperficies of the ſhell, as *plana, concava, longa*, and *lunata, lævis*, and *rugata*; by the ſhape of the margin, as *margine in mucronem emiſſo*; *margine fortis effuſo*; and *margine intus replicato*. The ſinuoſities, or projections of the ſhell, the connexion of the valves, and other ſimilar characters, were alſo taken as diſtinctions of the different families.

In Pliny's time the Romans are ſuppoſed to have poſſeſſed conſiderable opportunities of acquiring a knowledge of ſhells, as their navigation was extenſive, at leaſt in the Mediterranean and the Red Sea.

The conchological writings of Ælian are held in leſs repute than either of the preceding; he dedicates ſome conciſe chapters to this ſubject in his work entitled, "Περι Ζωων [illegible]."

After the dark ages which ſucceeded, Vincentius Bellovacenſis was one of the earlieſt writers on this ſubject. His "Speculum naturale," publiſhed in folio, in the year 1494, contains a deſcription of the murex, purpura, oſtrea, and a few other remarkable ſhells, extracted chiefly from the works of Ariſtotle and Pliny, and intermingled with the abſurd and ſuperſtitious notions of the times. The works of Albertus Magnus, entitled "De Animalibus," which appeared in folio in 1495, contains deſcriptions of ſome ſhells; and ſo likewiſe does that of Adam Lonicerus, "Hiſtoriæ naturalis opus novum," publiſhed in 1551.

The firſt writers who diſtinguiſhed themſelves by any attention to the ſtudy of conchology, after the revival of letters in Europe, were Belon, Rondeletius, and Geſner. Belon is celebrated for his travels in the Eaſt, and he was perhaps one of the firſt learned men who travelled principally with a view to natural ſcience; on his return to Paris, in 1553, he publiſhed, beſides other works, an octavo volume, entitled "De Aquatilibus." The part appropriated to conchology is not extenſive, it is rather elementary and philological than deſcriptive; but contains figures of a few ſhells engraven on wood. The work of Rondeletius (profeſſor of phyſic at Montpelier) appeared two years after, A. D. 1555; this bears the title of "Univerſa Aquatilium Hiſtoria," and contains upwards of one hundred ſpecies of teſtaceous animals. His reſidence on the coaſt of the Mediterranean afforded him abundant opportunity of inveſtigating the ſhells of that ſea, and their animal inhabitants, a ſubject of inquiry to which he paid ſome attention. This author received much aſſiſtance from the labours of Ariſtotle and Pliny. The "Commentaries" of Matthiolus, embelliſhed with a few cuts of ſhells, contain nothing of material intereſt, except what has been collected from former writers; ſeveral editions of this work appeared between the years 1566 and 1683, in Spain, Italy, France, and the Venetian ſtates. In 1558, the work of Conrad Geſner, "De Piſcium et Aquatilium Animantium Hiſtoria," made its appearance, and acquired much reputation. Dr. Pultney pays a high compliment to Geſner for his unparalleled induſtry, and ardent love of natural hiſtory, and obſerves, that he not only collected all the philological, hiſtoric, and deſcriptive erudition of the ancients on this ſubject; but beſides his own copious comment on their writings availed himſelf of what Belon and Rondeletius, his contemporaries, had done, to which he added much original matter of his own, having deſcribed and figured many of the Mediterranean ſhells and ſeveral of thoſe diſcovered in the Indian and Arabian ſeas. This comment is correct, but of the ſyſtem propoſed by Geſner for the claſſification of ſhells, we muſt ſpeak more fully. This author divides all ſhells into four claſſes, *univalvia, bivalvia, turbinata*, and *anomala*. The firſt contains only two genera, lepas and auris marina; or the limpets, and ſea ears (lepas derived from the Greeks, and ſynonymous with patella, being the name applied by old conchologiſts to the limpets, ſince called patella by Linnæus). His bivalvia claſs contains many genera, as oſtrea, ſpondyli, mytili, tellinæ, chamæ, pinnæ, ſolenes, and eight others. In the third claſs turbinata he has ten genera, as ſtrombi, murices, buccinum, turbo, trochus, nerites, &c. all which names will be recognized by the Linnæan ſtudent as thoſe employed by Linnæus. His fourth claſs anomala, is exceptionable, as it contains, beſides the balani, pencilla marina, tubuli marini, and echini, the ſtellæ marinæ, or ſtar-fiſh, and caput meduſæ, neither of which have ever been conſidered by other naturaliſts as appertaining to conchology. Bergen admits this as a material objection to his ſyſtem, "Peculiarem claſſem anomalorum condidit, ad quam, ut mihi videtur, adnumerandae. Idem valet de capite meduſæ." His ſeparation of the balani from the two firſt claſſes is countenanced by all late writers.

Geoffrey Linocier, in his "Hiſtoire des Poiſſons," publiſhed at Paris in the year 1558, gives an account only of a ſmall number of ſhells; the work not being devoted to the ſubject of conchology: neither is that of Imperato, publiſhed at Naples in 1599; though it contains an account of ſome ſpecies, this production relating chiefly to foſſils; it bears the title of "Dell'Hiſtoria di Ferrante Imperato Napolitana."

The work "De Mollibus Cruſtaceis, Teſtaceis, et Zöphytis," of Aldrovandus, appeared in folio, in 1606, and is well known. His arrangement conſiſts of three claſſes, *turbinata, bivalvia*, and *univalvia*. Among the turbinata he includes the nautilus, and alſo the buccinum, and other ſpiral ſhells, together with the echini. The bivalve claſs is the ſame with that of all other writers, as oſtrea, tellina, and pinna, but beſides theſe includes the multivalve ſhells of late authors, ſuch as the balani and pholades. The third claſs, or univalvia, contains the lepades, patellæ, auris marina, concha venerea, concha perſica, and pencillus marinus. The figures conſiſt of cuts on wood, and are rudely executed.

Fabius Columna, in 1616, publiſhed a treatiſe on ſhells, or rather a monographia on the purpura, entitled "De Purpura ab animali teſtaceo fuſa, de hoc ipſo animali, aliiſque rarioribus teſtaceis quibuſdam." A new edition of this work, with annotations, appeared in 1675, by John Daniel Major.

In the year 1616, a work entitled "Faſciculus rariorum et aſpectu dignorum varii generis, quæ collegit et ſuis impenſis æri ad vivum incidi curavit," from the pen of Baſil Beſler, apothecary at Nuremberg, made its appearance; it is in Latin and German, and two of the plates are appropriated to the ſubject of ſhells.

Chiocco, the deſcriber of the "Muſæum Calceolarium," publiſhed at Verona, in 1622, gives a full account of the ſhells contained in that collection, with ſpecific characters in the Latin language, borrowed for the moſt part from other authors. This muſeum was begun by Benedict Ceruto, a phyſician, and afterwards enlarged by Calceolari. The figures of the ſhells occupy ſix plates. It appears to be the firſt work that was written profeſſedly as a deſcription of a muſeum of natural curioſities, the account of the ſame muſeum by J. P. Olivius, publiſhed in 1584, alone excepted.

A phyſician of Hamburgh, Schonvelde, was author of an account of aquatic animals, both of the marine and freſh water kinds, found in the duchies of Sleſwick and Holſtein, which contains ſeparate chapters on oyſters and muſcles. The obſervations relate chiefly to the culinary uſes of the animals. This book bears date 1628.

The work of Niercembergius, "Hiſtoria Naturæ," contains an account of a number of ſhells, but does not preſent us with any figures. It was publiſhed at Antwerp, in 1635.

In the firſt edition of the "Gazophylacium Rerum Naturalium" of M. P. Beſler, the brother of Baſil Beſler before-mentioned, are twenty-four plates, containing, among a variety of other ſubjects, natural and artificial, a few figures of ſhells, with a conciſe deſcription in Latin of each, under the reſpective figures. The ſecond edition compriſes ſix additional plates and a preface in German. The firſt was publiſhed in 1642, the latter not till the year 1733.

The ſynoptical catalogue of Seger, "Synopſis Methodica rariorum tum Naturalium tum Artificialium quæ in Muſæo D. Olai Wormiis aſſervantur," was printed at Copenhagen in 1653; and, as the title informs us, deſcribes both the natural and artificial curioſities in the muſeum of Wormius. This was ſucceeded in 1655 by a more ample account of the muſeum by Olaus Wormius, from which it appears to have contained many of the teſtaceous tribe, one only of which is however figured; this is the Linnæan lepas anatifera, to which is attached the whole of the abſurd tale related by credulous writers of that day reſpecting the bernacle gooſe, which was ſuppoſed to be engendered, and hatched in thoſe ſhells! The ſixth, ſeventh, and eighth chapters of this work are deſcriptive of ſhells; theſe he divides into univalvia, bivalvia, and turbinata.

In 1672, the "Muſeum Moſcardianum," or "An account of the collection of natural curioſities belonging to an Italian nobleman, Conte Lodovico Moſcardo," appeared at Padua. The ſhells are compriſed in twelve plates, and the ſubjects are noticed ſpecifically. Another edition of this work made its appearance in 1672, at Verona, the city where that noble collector reſided, which, beſides the twelve plates above-mentioned (and which are engraven on copper) contains ſome cuts on wood.

The work "Hiſtoria Naturalis de Exanguibus Aquaticis" of Jonſton, is an extenſive production, a compilation for the moſt part from others, and is embelliſhed with a number of engravings, comprehending altogether twenty copper plates of molluſca and teſtacea. Like Aldrovandus, he diſtributes all ſhells into three principal claſſes, turbinata, bivalvia, and univalvia. His turbinata are ſubdivided into two ſections, "* in anfractum torta;" and "* * in orbem circumacta." In the firſt of theſe, we find the nautilus, purpura, buccinum, murex, conchylium, and blatta byzantina; and in the other, turbines, trochi, nerites, cochlea, and echini. Except the multivalves balani, and pholades, which he includes in his claſs bivalvia, the bivalves are thoſe of later authors; the claſs univalvia contains two genera, the lepas or patella, and concha venerea. This work was publiſhed at Amſterdam in 1657. Eight years after which (1665) the ſame author deſcribed a few of the more remarkable ſhells in his "Thaumatographia Naturalis."

About this time De Rochfort publiſhed an account of the ſhells of the Caribbee iſles, illuſtrated with a plate of five ſpecies, which he conſidered moſt remarkable for ſhape and beauty. This work bears the title of "Hiſtoire Naturelle et Morale des Iſles Antilles." Jean Baptiſte du Tertre, alſo, publiſhed on the ſame ſubject, "Hiſtoire generale des Antilles habitées par les François." Paris 1667.

The "Muſæum Gottorpianum," or "Muſeum of the Duke of Holſtein-Gottorp," was deſcribed by Adam Olearius, in 1666. This is in quarto, and of thirty-ſix plates which it contains, five conſiſt of ſhells, all which are referred to by Linnæus in various parts of his Syſtema. Another edition came out in 1674.

In the "Pinax Rerum Naturalium Britannicarum," publiſhed in London in the year 1667, by Merret, we are preſented with the earlieſt catalogue of the natural productions of Great Britain, extant. This is in octavo. The conchological part, which he calls "Teſtacei," occupies about half a page, and contains references to the voluminous works of Rondeletius, Geſner, Aldrovandus, and Jonſton.

Charleton, a phyſician of conſiderable celebrity, publiſhed, in London, in the year 1668, his "Onomaſticon Zoicum," in which a new arrangement appears. This author divides all ſhells after the manner of Aldrovandus and Jonſton, into turbinata, univalvia, and bivalvia, from whence it will be perceived, he inverts the order of the two laſt claſſes. His turbinated genera are literally tranſcribed from Jonſton. The univalves contain ten genera, five correſponding with thoſe of Aldrovandus, lepades, auris marina, concha venerea, concha perſica, and pencillus marinus, to which are added tubuli teſtacei, balani, conchæ anatiferæ, dentalia and entalia. His bivalve genera are leſs happily defined: in addition to thoſe eſtabliſhed by Jonſton, he forms others in imitation of Pliny, taken ſolely from the ſcaly aſperities, ſpines, or ſmooth exterior ſurface of the ſhells, after previouſly dividing the whole claſs of bivalves into two orders "conchæ aſperæ, and conchæ læves."

Nothing appeared from this time of material conſequence on the ſubject, till the re-publication of the treatiſe of Fabius Columna, by Dr. Major. In the interval, Steno publiſhed a work, entitled, "De ſolido intra ſolidum naturaliter contento Diſſertationis Prodromus," which contains ſome pages devoted to an explanation of the fabric and texture of teſtaceous bodies. Boyle deſcribed ſome experiments on the phenomena of ſhell-fiſh, particularly of the oyſter, under an exhauſted receiver, in the Philoſophical Tranſactions of the year 1670; and Willis, in 1672, the anatomy of the oyſter, in his "Exercitationes de Anima Brutorum;" but theſe are only phyſiological diſſertations. The work of Dr. Major includes a new ſyſtem annexed to the hiſtory of the purpura previouſly publiſhed by Fabius Columna, and likewiſe a "Dictionarium Oſtracologicum;" and is beſides illuſtrated with a number of wood-cuts. All ſhells are divided by this ſyſtematiſt into two claſſes, univalvia and plurivalvia, the firſt of which are ſubdivided into ſeveral ordines, the characters of which are taken from the form and ſtructure of the opening of the ſhell, its turbinations, ventricoſity, protuberances, or general figure. The genera conſtituted of thoſe ſhells are few, as penicilli marini, pyramidaliter dentata, lepades vel patellæ, auris marina, conchæ natatiles, concha venerea, nautilus, murices, turbo, turbines terreſtres, and buccina. His claſs plurivalvia is ſeparated into two orders, bivalvia and plurivalvia, the firſt of which conſiſts of his conchæ ſtriatæ, conchæ verrucoſæ, conchæ rugoſæ, pectines, oſtreæ, and conchæ anomiæ; the plurivalvia only two genera, conchæ anatiferæ and balani, or glandes. The two latter genera are thoſe united by Linnæus, under the name of lepas, and which, before the time of Major, had been improperly arranged, either among the bivalves, or univalves, except by Geſner, who, aware of this impropriety, places the balani at the head of his claſs anomala. This production of Major's appeared in 1675.

Legati was author of the "Muſeo Coſpiano," printed at Bologna in 1677. The baſis of this collection was laid by the celebrated Aldrovandus, whoſe hand-writing ſtill remains affixed to many ſpecimens that formed the ſubjects of Legati's deſcription. Ferdinando Coſpi, a Bologneſe patrician, afterwards augmented it ſo conſiderably, that his name became attached to it; and the univerſity of Bologna, to which it was at length preſented, conſidered it one of their moſt valuable acquiſitions. There are not many figures of ſhells in the "Muſeo Coſpiano," but the deſcriptions of this tribe are numerous, and very ample.

In the twelfth volume of the Philoſophical Tranſactions, is a "Relation concerning Barnacles," by ſir Robert Moray. This credulous obſerver gives a deſcription illuſtrated by a rough outline of lepas anatifera, from which he aſſerts, that young geeſe may actually be ſeen to emerge.

Harderus, in a diſſertation entitled, " Examen anatomica Cochleæ terreſtris domiportæ," affords an anatomical deſcription of helix lucorum. This appeared at Baſil in 1679. Two years after Grew publiſhed his " Muſæum Regalis Societatis," or " Catalogue and deſcription of the natural and artificial rarities belonging to the Royal Society, and preſerved in Greſham college, London." This was the earlieſt work of its kind that appeared in the Engliſh language. The ſhells are deſcribed in two chapters, the firſt comprehending univalves, the ſecond bivalves and multivalves, illuſtrated with about forty figures, to which the current Engliſh names are annexed.

Buonanni was contemporary with Grew, and in the ſame year (1681) publiſhed at Rome his " Ricreazione dell' Occhio, e della Mente nell' oſſervation' delle Chiocciole," a work of very ſuperior merit, and eſteemed the firſt profeſſedly written, at any conſiderable length, upon the ſubject of conchology. This was originally printed in Italian; but was three years afterwards re-publiſhed, with additions, in Latin, under the title of " Recreatio Mentis et Oculi in Obſervatione Animalium teſtaceorum." The firſt work contains a ſeries of 450 figures, the number of which is augmented to 550 in the Latin re-publication. Theſe are valuable for reference, as being conſtantly mentioned in the Linnæan Syſtema Naturæ; their greateſt fault (and it is certainly a material objection), is that many of the ſhells are reverſed by the inaccuracy of the engraver, ſo that the apertures of the ſpiral or turbinated ſhells turn to the left inſtead of the right. The ſubjects were obtained chiefly from the celebrated muſeum of Kircher; a deſcription of which was afterwards given by Buonanni under the title of " Muſæum Kircherianum."

The deſcriptions are not entirely approved by late writers; they are conſidered too looſe and deſultory, or too conciſe and uninſtructive. His diſtribution of ſhells comprehends *univalvia non turbinata, bivalvia*, and *turbinata*. In the inferior diviſions, this author, Dr. Maton obſerves, " has ſtrangely ſeparated ſpecies naturally allied to each other, as, for inſtance, the ſerpulæ, dentalia, &c. are left out of the firſt claſs, and, as well as the porcellaneæ, diſtributed under the third; and, with equal want of conſiſtency, the haliotis and nautilus (genera manifeſtly turbinated) are placed among thoſe which he terms " univalvia non turbinata." The ſame objection is urged by Bergen againſt the ſyſtem of Buonanni. " Hic A. tres condidit conchyliorum claſſes; univalvium, non turbinatorum, bivalvium et non turbinatorum, ſed partim aliena immiſcuit, partim neceſſaria omiſit. Sic in prima claſſe merito deſiderantur pencilli marini et porcellaneæ, quas perperam ad turbinatas refert. Sic malo conſilio aurem marinum, et nautilium huic primæ ſociavit claſſi, cum manifeſte ex turbinatorum gente ſint." Buonanni is blamed alſo for admitting the pholades and conchæ anatiferæ into his ſecond, or bivalve claſs; but it ſhould be remembered, in this reſpect he only imitated the example of moſt ſyſtematic writers; Geſner places the pholades among the bivalves; Aldrovandus gives both the pholades and concha anatifera in that claſs; and Jonſton the former. Linnæus, we are to recollect, like the latter, conſiders the pholades as bivalves in all the early editions of the Syſtema; even ſo lately as the tenth edition, they ſtand under the " bivalviæ conchæ." We may ſtill further advert to Charleton, who yet more abſurdly arranges the concha anatifera with the univalves, at the ſame time that he refers the pholades to the bivalve tribe. Major was the only writer before the time of Buonanni who diſpoſed of the conchæ anatiferæ in their natural order, which he certainly did, by arranging it in his claſs plurivalvia. In the work of Buonanni will be found many philoſophical obſervations upon the origin, nature, formation, properties, and other curious particulars relative to teſtaceous bodies.

The " Scotia Illuſtrata" of ſir Robert Sibbald, publiſhed at Edinburgh in 1684, offers an outline of another ſyſtem. The author divides ſhells into two parts, the land and aquatic kinds, or " cochleæ terreſtres," and " cochleæ aquatiles." The aquatiles are divided into two ſections, the firſt containing the freſh-water ſhells, the other thoſe peculiar to the marine element. The ſhells of both kinds are diſtributed into three families, turbinatæ, bivalves, and univalves. The ſubdiviſions of thoſe families are rudely defined, but upon the whole there is method in the claſſification; the genera are ſelected from the writings of former naturaliſts, but too ſparingly. Sibbald places the echini among the turbinated ſhells; yet this is even more excuſable than his introduction of both the pholades and balani among the univalves.

Marſigli's ſmall work on the ova of teſtaceous animals, appeared at Bologna, in 1683, under the title of " Relazione del Ritrovamenta dell' uova di Chiocciole;" a new edition of which was publiſhed at Rome in 1695. Some additional obſervations on the ſame ſubject, by Fulberti, " Refleſſioni ſopra il medeſimo Soggetto," uſually accompany this work.

Among the " Obſervazioni Naturali" of Paolo Boccone, publiſhed at Bologna in 1684, are ſome remarks not altogether unintereſting on the ſubject of conchology. He was the firſt writer who deſcribed the pediculus ceti (lepas diadema of late authors) with accuracy.

In the ſame year Detteide gave an anatomical deſcription of the common muſcle in the Leipſic Commentaries, and which was afterwards re-publiſhed in Valentini's " Amphitheatrum Zootomicum."

An elaborate paper on the purple-fiſh (buccinum lapillus) by Mr. William Cole, pointing out the mode of obtaining, and the nature of this celebrated dye, or Tyrian purple, was inſerted ſhortly after in the Tranſactions of the Royal Society. This tract was re-printed in quarto in 1689.

A production of very uncommon merit about this period made its appearance before the public, the great conchological work of Dr. Liſter, entitled " Hiſtoria ſive Synopſis methodica Conchyliorum," the publication of which commenced in 1685. The author had previouſly diſtinguiſhed himſelf by ſome excellent diſſertations on the ſame ſubject; but our attention is principally directed to this, as his moſt extenſive, if not moſt valuable, undertaking. It was publiſhed in folio progreſſively from the year 1685 to 1692.

Liſter divides his work into four books. 1. " De turbinibus terreſtribus." 2. " De Turbi. aquæ dulcis et Bivalvibus aquæ dulcis." 3. " De Bivalv. marinis, et conchis anatiferis." 4. " De Patellis Dentalibus, &c. et de Buccinis marinis."

There is no text to this work, the whole conſiſting of engravings, with a conciſe deſcription of the ſhells, and reference to their native country, where that could be aſcertained, in the Latin tongue; and ſometimes their current names in Engliſh. The plates, which are of various dimenſions, are executed with great force and ſtrength of colour by the hands of the author's two daughters, Suſannah and Ann Liſter. It is an extraordinary circumſtance, that no two copies of this work are found alike, which renders it very complex, and ill ſuited for general reference. The plates in the moſt perfect copies vary in number from 1050, to 1057, or 1067, the different copies having been augmented or diminiſhed, and the plates tranſpoſed or corrected at various times, according to the fancy of the author, or his ſubſequent diſcoveries. The moſt perfect of all the copies extant was that preſented by Dr. Liſter himſelf to the royal library at Paris. This is aſcertained by the obſervations of Davila and M. de Bure, who have taken conſiderable pains in the collation of different copies of this work. Da Coſta names that in the library of the College of Phyſicians as the moſt complete copy in London. This laſt-mentioned writer appears alſo to have collated many of the early copies of Liſter; he treats on this topic at ſome length; and, conſidering the importance of Liſter's work to the conchological ſtudent, it may not be improper to repeat the reſult of his obſervations.

"I do not think it unentertaining (ſays this writer) to relate ſome circumſtances relative to this uſeful and coſtly work, which have occurred to me, on the collation of many copies of the old editions of Liſter, and on a collation of numbers of his proof prints diſperſed among the curious by Dr. Liſter himſelf before the names and numbers on the plates were added to complete the work; theſe proof prints, which are what the print collectors ſtyle variations, will lead us to ſome curious particulars that would otherwiſe be unknown. Dr. Liſter in 1678 publiſhed his "Hiſt. Anim. Angl." in which he treats of Engliſh ſhells, and gives excellent figures of them, and good deſcriptions; he therefore deſigned this work, (his "Hiſt. Conchyl.") only for exotic or foreign ſhells, as evidently appears from the proof head plates of the firſt book. N. 8, 25, 33, 40, 43, 63, 74, 83, 99, 108, 125, and 136, which are entitled cochleæ, buccina, &c. exotica; but the word exotica was eraſed when he changed his mind to have a general hiſtory of ſhells, which probably was at the ſecond book, and the eraſement of the word exotica is even now plainly ſeen in all the quoted plates. Dr. Liſter, to complete his intended work, carried home all the ſhells ſingly to his daughters to engrave on ſingle or detached copper plates, (as is ſeen by the work) reſerving their arrangement till he had a ſufficient number, ſome not being done to his approbation, or getting better ſpecimens afterwards, he had them re-engraved, and therefore many ſhells appear twice in his work, and in ſome only the firſt engraving, while in others only the ſecond engraving is found; this circumſtance is alſo evident from the proof plates, or variations." Da Coſta further ſtates it to be a miſtaken ſuppoſition that there was only one edition of this work; there were, he ſays, certainly two, and he concludes with theſe obſervations in ſupport of his aſſertion. "However, there are marks by which theſe editions may be diſtinguiſhed by an accurate critic, *viz.* 1. The ſecond edition has ſeventy-five ſhells more than the firſt. 2. In the preface, plate IV. the third paragraph begins "Septuaginta autem, &c." 3. In plate VII., which ſpecifies the places where they are found, the firſt edition has only one column of names, whereas the ſecond edition has a name, *viz.* Fret Magel, in a ſecond column. 4. The title and all the head plates, as 1, 2, 3, 100, 106, 139, 140, &c. are printed partly in black and partly in red letters; whereas in the ſecond edition only the title, plate I., is printed in red and black letters, all the others being printed only in black letters."

The plates of this work were bequeathed to the univerſity of Oxford, and were re-publiſhed in 1770, under the direction of the Rev. Wm. Huddesford, keeper of the Aſhmolean muſeum, who ſubjoined two indices, one according to Liſter's diſtribution of the ſhells, the other after that of Linnæus. This edition differs from the former principally in containing ſeveral plates on one page, the whole amount is 1085, comprehending altogether 1153 ſhells, excluſive of the foſſils and anatomical ſubjects; ſeven of the plates, however, which appeared in the original work are omitted in this edition.

After this period, and previous to the work of Rumphius, the firſt edition of which appeared in 1705, the names of Fehr, Normann, Schelhammer, and others, are recorded as contributors to the elucidation of conchology, yet their productions are to be regarded only as ſubſervient to more extenſive and important inveſtigations. Fehr wrote a diſſertation on the argonauta argo, which was printed in "Eph. Acad. Nat. Cur." A. D. 1686. Normann, in the ſame year, gave an anatomical diſſertation on the purpura, which was publiſhed at Upſal. The obſervations of Schelhammer, publiſhed in "Eph. Acad. Nat. Cur," relate to the ſubject of freſh water ſhells. Brachius alſo treats of the ova of ſome ſpecies of oſtrea. "Le Cabinet de la Bibliotheque de Saint Genevieve," of Du Molinet contains a few figures of ſhells. In the Philoſophical Tranſactions, vol. xvii. is a communication on the ſubject of ſhells, addreſſed to Dr. Liſter, by Mr. Baniſter who reſided many years in Virginia, and in the ſame volume is a deſcription of certain ſhells found in the Eaſt Indies by Witzen, but theſe are confeſſedly too imperfect to merit further mention. Sir Robert Sibbald alſo publiſhed ſome curious papers on teſtaceology about this time, but his ſyſtem, and beſt production, on this ſubject, have been already noticed. Ericus, in a diſſertation entitled "Conchæ anatiferæ vindicatæ," refutes the abſurd tale of the Bernacle geeſe hatching in thoſe ſhells as related by ſir Robert Moray. Leeuwenhoek publiſhed ſeveral treatiſes on the anatomy or inteſtinal ſtructure of ſhells. Leigh notices a few of the Britiſh ſhells in his "Natural Hiſtory of Lancaſhire;" and Wallace an inconſiderable number in his "Account of the iſlands of Orkney." The works of Petiver, which are diſperſed in the 22d, 23d, and 24th volumes of the Philoſophical Tranſactions, and his "Gazophylacium Naturæ et Artis," may be conſulted with advantage, being referred to by Linnæus and other late conchologiſts. This brings us to the time of Rumphius.

The popular work uſhered into the world under the immediate patronage of the liberal collector laſt mentioned, claims particular notice. This valuable acquiſition, for ſo it muſt be conſidered, bears the title of "Amboinſhe Rarite it Kamer," the "Rarity Chamber of Amboyna;" and contains an account of the more remarkable natural curioſities in his muſeum, the productions of Amboyna, where they had been collected chiefly by Rumphius himſelf. The deſcriptive matter is from the pen of M. Schein Voet, and the plates are engraven in a bold ſtyle from the deſigns of Madame Merian. Of ſixty plates with which this work is embelliſhed, no leſs than thirty-three are devoted to the ſubject of ſhells, the total number of which amounts to about four hundred ſubjects, and many of theſe were of great rarity and price in thoſe days. The paſſion for collecting and forming cabinets and muſeums began at this period to be very prevalent in Holland, from whence it afterwards extended over the other parts of Europe. The collection of Rumphius was an object worthy of emulation, and many wealthy individuals endeavoured to excel in this purſuit. The forming a collection of rarities at that period was conſidered a ſerious undertaking. Articles of rarity of this deſcription will always obtain a conſiderable price. It is related as a matter of aſtoniſhment that Rumphius himſelf informs us a ſhell deſcribed in his work coſt no leſs than five hundred florins. The ſum is great, yet there are few cabinets of any note that do not include articles of equal or much ſuperior value.

Lyonet eſtimated the price of his famous " cedo nulli" far higher, namely, 100*l.* ſterling; and many inſtances of great prices being paid for ſuch objects might be adduced. There are two editions of the work of Rumphius, the firſt written in the Dutch, the other in the German language.

Levin Vincent was one of the moſt diſtinguiſhed Dutch collectors. Contemporary with Rumphius, he has left us a deſcription of his muſeum, dated 1706, and bearing the title of " Wondertooneel der Nature." This work was printed at Amſterdam entirely in the Dutch language; the various objects are repreſented as they were placed in caſes, drawers, or boxes, in a confuſed manner in the muſeum; among which we recognize a prétty conſiderable number of ſhells. An abridged account of the muſeum, with impreſſions of the ſame plates, was publiſhed afterwards.

The papers of Reaumur, inſerted in the memoirs of the French academy, between the years 1709 and 1717, deſerve the attention of the conchologiſt; they relate, for the moſt part, to the formation, growth, and motive powers of teſtaceous animals. The natural hiſtory of the pinnæ, and the formation of pearls, are amply treated of in a memoir which appeared in the volume for 1717.

In 1710 Fridericus Ruyſch publiſhed a deſcription of his muſeum at Amſterdam, entitled " Theſaurus Animalium primus:" it relates only in a partial degree to ſhells, the figures of which are grouped with coral and other ſubſtances as they ſtood in his muſeum.

Morton, the natural hiſtorian of Northamptonſhire, deſcribes many ſhells, for the figures of which he refers to Liſter. This work was publiſhed in folio in 1712.

Among the plates illuſtrative of various curious ſubjects, contained in the muſeum of Gottwald of Dantzic, dated 1714, forty-three are appropriated to ſhells. Few of the original copies are complete; that poſſeſſed by ſir Joſeph Banks is perfect.

Three plates of ſhells are to be found in the botanical work of Barrelier, edited by the elder Juſſieu, which appeared in 1714; and the like number in the " Rariora Muſei Beſleriani" of J. H. Lochner, publiſhed two years after. The " Amphitheatrum Zootomicum" of M. B. Valentini, brought forward at Frankfort in 1720, includes many extracts from foregoing authors, and ſome plates relative to ſhells, but which are not conſidered to poſſeſs any merit of originality, or execution. Bradley, in his philoſophical account of the works of nature, touches on the ſubject of teſtaceology though in a ſuperficial manner.

The valuable work of Car. Nic. Langius, " Methodus nova Teſtacea Marina in ſuas Claſſes, Genera, et Species diſtribuendi," was publiſhed in quarto at Lucerne, in 1722. To the writings of this able naturaliſt Linnæus ſtands highly indebted. " He is an author (ſays Dr. Maton) not undeſerving the title of a ſcientific one, and whoſe ſyſtem, ſo far as marine teſtacea are concerned, and of theſe alone he treats, certainly glances at the great clue to ſimplicity, which was afterwards ſo ſucceſsfully and admirably ſeized by the great reformer of natural hiſtory in general."—" He is the firſt whoſe generic characters are founded on commodious diſtinctions; the aperture of univalves, and the hinge of bivalves, being particularly conſidered. Theſe diſtinctions are not allowed their due importance throughout, for the contour of the ſhell is, in many inſtances, made the excluſive baſis of the definition, and the adoption of this naturally led, as in other ſyſtems, to a moſt inconvenient and perplexed multiplication of genera. The parts, claſſes, and ſections, alſo are far from being well conceived, and embarraſs rather than aſſiſt the inveſtigation of the other diviſions." After peruſing theſe general ſtrictures the curious reader may be deſirous of acquiring ſome knowledge of this author's ſyſtem. We are inclined to think it entitled to rather higher praiſe.

Langius divides ſhells into three parts. 1. Teſtacea marina univalvia, non turbinata. 2. Cochleæ marinæ. 3. Concha marina.

His firſt part is ſubdivided into two claſſes. Claſs 1. Teſta marina univalvia non turbinata, et in ſe non contorta. Claſs 2. Teſta marina univalvia, non turbinata in ſe contorta, ita, ut eorum ſpiræ non promineant. His cochleæ marinæ, or part. 2. conſiſts of ſix claſſes, *viz.* 1. Cochleæ marinæ longæ. 2. Cochleæ canaliculatæ. 3. Cochleæ marinæ ore et mucrone ſimul elongatis, prima ſpira notabiliter ventricoſa. Buccina. 4. Cochleæ marinæ ore, et mucrone elongatis, prima ſpira notabiliter anguſtiori quam in Buccinis. Strombi. 5. Cochleæ marinæ ore admodum brevi mucrone inſigniter elongato. Turbines. Trochi. 6. Cochleæ marinæ breviores ore et mucrone contractis. The third part, or conchæ marinæ, conſiſts of three claſſes. 1. Conchæ æquilateræ. 2. Conchæ inæquilateræ. 3. Conchæ anomalæ ſ. Valvis inæqualibus. The claſſes are divided into ſections, the diſtinguiſhing characters of which are taken from the moſt prominent features of the various tribes of ſhells, as the form of the ſhell itſelf, the ſtructure of the aperture, the canaliculation, or lip, &c. in univalves; and the ſhape of the valves, their diſſimilarity, the beaks, hinge, teeth, &c. in bivalves. The ſections are divided into many genera, the firſt claſs containing ſeventeen, the ſecond fifty, and the third forty-three. Many of the genera of old writers are divided, and oftentimes not injudiciouſly, into two or more genera, to which new names are aſſigned, that Linnæus and later writers have adopted. We cannot further digreſs on the merits of this work, but as a ſyſtem recommend it to the attention of the curious conchologiſt.

In the work, entitled " Oud en Nieuw Ooſt-Indien," by Valentyn, are ſixteen plates of Eaſt Indian, or Amboyna ſhells. This bears date Amſterdam 1724 and 1726, having been publiſhed in folio parts. Thoſe plates were afterwards ſold ſeparately with deſcriptions; the new edition of the plates appeared in 1754.

" Sloane's Hiſtory of Jamaica" is a valuable work, and relates to conchology, among a miſcellaneous variety of other departments of natural hiſtory. He was the firſt perſon who viſited the Weſt India iſlands for the ſole purpoſe of inveſtigating their natural productions, and his plates and deſcriptions relate of courſe to many ſubjects not before known. His diſcoveries were ſubmitted to the public in 1725.

In the following year, John Chriſt. Kundmann publiſhed his " Promptuarium rerum naturalium et artificialium," &c. in quarto. He propoſes three principal claſſes for the arrangement of ſhells. Claſſis 1. Teſtacea univalvia non turbinata. Claſſis 2. Teſtacea bivalvia. Claſſis 3. Teſta univalvia turbinata; each of which is divided into a number of genera, ſomewhat after the method of Buonanni.

A new arrangement of ſhells, by John Erneſt Hebenſtreit, appeared at Leipſic in 1728; " Diſſertatio de Ordinibus Conchyliorum methodica Ratione inſtituendis." The limits of our obſervations will not permit us to enter minutely into this methodus teſtaceorum. The ſyſtem of this author comprehends ſeveral principal claſſes: namely. Claſſis 1. Univalvia irregularia. Claſſis 2. Univalvia regularia, quæ ſpira carent. Claſſis 3. Univalvia regularia, quæ ſpira gaudent magis turbinata, turbine per totum excurrente. Claſſis 4.

De vertice tantum turbinata, ore per totum hiante, turbinibus obliqué flexis. Claſſis 5. Univalvia, vertice tantum turbinata, ore per totum hiante, ſpiris circa centrum flexis. Claſſis 6. Minus turbinata ſpira unica brevi. Claſſis 7. Bivalvia valvis per ginglymum connexis. Claſs 8. Bivalvia per ginglymum cohærentia. The outline of his arrangement may be collected from his definition of the claſſes. His families, or ſubdiviſions, and genera are numerous, and are characterized by the figure of the ſhell, the aperture, hinge, and other remarkable particulars. Dr. Maton accuſes this writer of having introduced an uſeleſs, if not unphiloſophical diſtinction, between teſtacea and conchylia. Bergen previouſly makes the ſame objection. "Cl. auctor diſtinguit inter teſtacea et conchylia, et notionem generaliorem tribuit prioribus, quia et malacoſtri, et oſtracodermata; conchylia vero ſola oſtracodermata ſub ſeſe comprehendunt, ſed non magni momenti mihi videtur hæc diſtinctio, ſi viciſſim conſidero et perpendo ſub notione teſtæ et duram et mollem teſtam intelligi poſſe."

The "Diſſertatio Phyſica de Polythalamiis, nova teſtaceorum claſſe," of Breynius, comprehends an arrangement of recent and foſſil ſhells, but the chief merit of the work is allowed to conſiſt in the more exact definition this writer affords of the *belemnitæ*, *ammonitæ*, and *orthoceratitæ*, than had before appeared. Of the orthoceras tribe, he deſcribes eight diſtinct ſpecies, the two others are treated leſs copiouſly. His claſſification of recent ſhells is far from perſpicuous. This was publiſhed in quarto in 1732.

About this period, the attention of many ingenious writers was directed to the inveſtigation of the teredo, or ſhipworm, then, as it was believed, very recently imported from warm climates into Europe; it was firſt obſerved in Holland. The firſt alarm was given by the perſons appointed to take care of the dykes, who perceived, that the piles which were of the hardeſt oak, and had been placed to defend the low countries from the incurſions of the ſea, were eaten through in a few months. The damage occaſioned was immenſe, and the people of Holland thrown into the utmoſt conſternation, till remedies were diſcovered to prevent the evil. Among the writers on the ſubject, are Valliſneri, Rouſſet, Patoneus, Belkmeer, Maſſuet, and Sellius, the laſt of whom particularly diſtinguiſhed himſelf by his work entitled, "Hiſtoria Naturalis Teredinis ſeu Xylophagi Marini."

Du Hamel, in a paper inſerted in the "Memoirs of the French Academy," in 1736, treats on the purpura of the ancients. The work of Swammerdam, "Biblia Naturæ," appeared in 1737, and will be found to contain much curious matter, and anatomical reſearch into the nature of teſtaceous animals. In 1739, the work of James Plancus, "De Conchis Ariminenſibus minus notis," appeared in Venice. This relates principally to the minute ſhells found at Rimini in the Adriatic ſea. Some of the microſcopic ſhells deſcribed by this author, very much reſemble the cornu ammonis. A ſecond edition was publiſhed in 1748, and another at Rome in 1760.

Gualtieri's work on ſhells is a ſtandard book of reference, and as ſuch is well known. This is entitled "Index Teſtarum Conchyliorum quæ adſervantur in Muſeo Nicolai [illegible]" &c. It was publiſhed in Latin at Florence, in 1742, and contains 110 plates of ſhells; the figures of the univalves in which are ſingularly placed on their ſummit; they are notwithſtanding tolerably correct: the deſcriptive matter is leſs intereſting. This author exhibits a ſyſtem of ſhells compoſed by Tournefort, the celebrated botaniſt, long before this time, from manuſcripts on the ſubject that had been preſented to him by profeſſor Targioni. This arrangement is valuable, and highly worthy the peruſal of the inquiſitive conchologiſt. The Linnæan ſtudent, in particular, will perceive that to Tournefort, as to Langius, he is indebted for ſome of the lateſt amendments of the Linnæan ſyſtem, and for many of the ſubdiviſions and terms in preſent uſe.

"La Conchyliologie" of D'Argenville is a voluminous work, and contains a vaſt number of excellent deſcriptions, and many figures. The firſt edition of this work appeared anonymouſly, under the title of "L'Hiſtoire Naturelle éclaircie dans deux de ſes parties principales, la Lithologie, et la Conchyliologie," &c. in 1742; and a ſecond edition, conſiderably augmented, in 1754. The laſt edition was publiſhed in the year 1780, with many additions, corrections, improvements, and a ſeries of plates containing about 2000 figures, by M. Favanne de Moncervelle and his ſon.

The name of Bartram occurs to a paper in the Philoſophical Tranſactions, vol. xliii. A.D. 1744, entitled "Obſervations concerning the Salt-marſh Muſcle, the Oyſter-banks, and Freſh-water Muſcle of Penſylvania," illuſtrated with figures. A copious account was alſo given about this time by Needham, of the lepas anatifera. The "Teſtaceo-Theologia" of Leſſer, is embelliſhed with 137 figures of ſhells, and abounds with phyſiological and anatomical obſervations on the ſtructure of theſe teſtaceous animals.

Some mention is made of ſhells in Dr. Charles Smith's "Hiſtory of the Counties of Waterford, Cork, and Kerry," A.D. 1745—1756. Two papers, one relating to mytilus lithophagus, and the other to pholas puſilla, are inſerted in vol. xlv. and vol. lv. of the Philoſophical Tranſactions. In ſir John Hill's "Hiſtory of Animals," are an arrangement of ſhells, and ſome figures; it appeared in folio in 1752.

The firſt work of Klein's that claims mention in this place is his "Deſcriptiones Tubulorum Marinorum," containing nine plates, which chiefly repreſent different ſpecies of belemnitæ, with various kinds of recent ſhells, as ſolenes, dentalia, &c., and are introduced in order to complete his arrangement of the tubular coverings of animals. But the principal production of this writer is his "Tentamen Methodi Oſtracologicæ, ſive Diſpoſitio Naturalis Cochlidum & Concharum, in ſuas claſſes, genera, & ſpecies," &c., printed at Leyden in 1753. It has been objected againſt this work that the general diviſions forming parts, ſections, claſſes, and genera, are too numerous; and what is worſe, that ſpecies are conſtituted, in ſome inſtances, without being referable to any genus, and that, in one of the parts, there is a ſolitary genus without any claſs. (Dr. Maton)—"Claſſes, genera, & ſpecies nimium, ut mihi videtur, multiplicavit: quæ ſæpe ſunt variationes ſpecierum, ſpecies vocavit; quæ ſunt ſpecies, generum nomine inſignivit; & ex generibus quibuſdam claſſes condidit," &c. Bergen.

The outline of an arrangement formed by a naturaliſt ſo eminent as Klein ſhould not be paſſed over unnoticed. All ſhells are divided by this writer into four principal parts, in the following manner:

Pars 1. *Cochlides,* canales teſtacei, circa principium tenues & clauſi, in gyros gradatim vaſtiores conſtanti ratione circumacti.

Pars 2. *Conchæ.* Teſtæ vaſculorum inſtar explanatæ & concavæ, variorum animalium exſanguium habitacula, teſtarum numero a ſe invicem differentes.

Pars 3. *Polyconchæ,* quæ pluribus valvulis quam duabus gaudent.

Pars 4. *Niduli teſtacei*, teſtacea animalium domicilia in forma niduli ſeſſilis catervatim plerumque corporibus marinis ſuperſtructa.

The *cochlides* comprehend two ſections, "cochlis ſimplex, and cochlis compoſita:" theſe are again ſubdivided into families, and laſtly into genera. Among the ſhells included in the firſt of theſe, we find the nautilus, cornu ammonis, neritæ, auris marina, trochus, ſtrombi, turbines, and the buccinum; and in the ſection cochlis compoſita, the bulla, porcellana, and murex. The ſecond part, *conchæ*, of this author is compriſed in three ſections "monoconchæ, diſconchæ æquales, and diſconchæ inæquales." Among the firſt of theſe, we obſerve the patella, in the ſecond, the oſtrea and ſpondylus, and in the third, the terebratula. Part 3, or *polyconchæ*, conſiſts of "concha anatifera." Part 4, comprehends the balani under the title of "monolopus and polylopus;" and as an appendix to part 4, and as a fifth part, the "echinus marinus, and tubulus marinus."

Although the diſtribution of ſhells after the manner of Klein does not meet our ideas of a correct methodical arrangement, it is but candid to ſay, that many of the genera he propoſes have been rejected by later writers without ſufficient conſideration, and others derived from his labours without acknowledgment. Let us pauſe and candidly examine this arrangement, and we ſhall perceive that not only Linnæus himſelf derived very conſiderable aſſiſtance from his work, in the latter editions of the "Syſtema," but that many of the ſuppoſed new genera of the French writers, in the preſent day, are drawn from this very ſource. This work contains twelve plates, and beſides the ſyſtem above noticed, comprehends a diſſertation on the form, growth, and colour of ſhells "De Formatione, Cremento et Coloribus Teſtarum."

The "Conſpectus Sciographicus Teſtaceorum" of J. H. Cohauſen, was printed at Frankfort about the year 1750.

In 1755, a work of conſiderable importance, the production of Nicholas George Geve, an eminent painter, appeared in quarto at Hamburgh, under the title of "Monatliche beluſtigungen im reiche der Natur, an Conchylien und Seegewächſen," or "The monthly amuſement of Shells and Sea Productions." This publication came out in parts, and was favourably received, but being pirated was diſcontinued. The total number of plates publiſhed appears to be 33, the figures in which amount to 434.

The memoirs of the French Academy for 1756, contain a curious paper on the characters of ſhells, in which fourteen genera are deſcribed, founded on the nature of the animal inhabitants; this bears the title of "Obſervations qui peuvent ſervir à former quelques charactères des coquillages," and is from the pen of Guettard; another paper alſo on the ſubject of conchology, "Sur le Rapport qu'il y a entre les Coraux et les Tuyaux marins, et entre ceux-ci et les Coquilles," from the ſame writer appears, in the Memoirs of that Academy for 1760, to which five plates of ſerpulæ, dentaliæ, &c. are annexed. Guettard was beſides theſe the author of two or three ingenious tracts on the ſame ſubject, the titles of which do not immediately occur to us. The "Diſſertatiuncula de Cornu Ammonis nativo Littoris Bergenſis in Norvegia," produced in 1757, and "De Tubulis vermicularibus cornu ammonis referentibus," bearing date 1761, are both the performances of J. F. Hoffman, and appeared originally in the Tranſactions of the Electoral Academy of Mentz. Theſe, as their titles imply, relate to a ſuppoſed diſcovery of ſome recent ſhells of the cornu ammonis tribe, but which, in reality, are only of the nautilus kind, though bearing a remote reſemblance to the foſſils known by the title of ammonitæ. Shells ſimilar to thoſe had been before obſerved by Plancus. Another paper in the ſame volume as that laſt mentioned is from this writer, and bears the title of "De Concha Sphærica fluviatili, alata ex badio et nigro colore variegata."

"The Civil and Natural Hiſtory of Jamaica," publiſhed in London in 1756, by Dr. Patrick Browne, contains a ſcheme of ſhells, which, conſidering the ſtate of the ſcience of conchology at that period, is leſs ſatisfactory than might be expected. Shells are divided by this author into three claſſes, *univalvia*, *bivalvia*, and *plurivalvia*. The characters of his ordines are taken, in the univalves from the hollow of the ſhell being non-ſpiral, or ſpiral, and the ſituation, and form of the aperture, and the lip; in the bivalves from the ligament of the hinge, and the teeth; and in the plurivalves from the connecting ligament of the valves.

The "Opere Poſtume" of count Joſeph Ginanni of Ravenna, contains a deſcription of the maritime, marſh, and terreſtrial ſhells of the territory of Ravenna, after a ſyſtem ſomewhat ſimilar to that of Buonanni. The firſt of theſe tribes is illuſtrated by thirty-one plates, the ſecond by four, and the third by three. The deſcriptive matter is in the Italian language. It was publiſhed in folio, in 1757.

Adanſon's "Hiſtoire Naturelle du Senegal," was publiſhed at Paris in 1757. This uſeful work contains a new arrangement of conchology, and a ſeries of about four hundred figures of ſhells, with the animals appertaining to the principal families. This production of Adanſon's is in much eſteem with the continental naturaliſts.

The books of Baſter, "Opuſcula ſubſeciva, obſervationes miſcellaneas de animalculis," &c. dated Harlemi, 1759, 1760, 1761, 1762, and two 1756, afford the curious reader much information relative to the anatomical, and phyſiological nature of teſtaceous as well as cruſtaceous animals. In theſe we find the propagation, and ovaria of ſhell fiſh in general, treated of in an ample manner. A tranſlation of the author's diſſertation on the teredo navalis appears in the Philoſophical Tranſactions.

A monographia on helix decollata, entitled "Obſervations ſur une eſpece de Limaçon terreſtre dont le ſommet de la Coquille ſe trouve caſſé ſans que l'Animal en ſouffre," by M. Briſſon, is inſerted in the memoirs of the French Academy for 1759.

The teſtaceological labours of the celebrated Linnæus ſhould be particularly adverted to in this place. One of the earlieſt of his productions on this ſubject is the "Fauna Suecica," the firſt edition of which was publiſhed in 1746, and contains an account of ſixty different ſpecies of Swediſh ſhells. His travels in Gothland, "Wäſtgöta reſa, förättad ar 1746," appeared at Stockholm the year after, and though teſtaceology had only partially intereſted the remarks of Linnæus, we are here preſented with a deſcription of ſeveral ſhells obſerved in his journey, and likewiſe a plate including a number of figures, rude indeed in the execution, and ſtill more defective in repreſenting all the univalves as heteroſtrophous ſhells, but valuable as a plate of reference to conchologiſts even at this day, (vide Donov. Brit. Shells, murex deſpectus). The "Muſæum Teſſinianum," publiſhed in 1753, and "Muſæum Adolphi Frid. Sueciæ Regis," in the year following, ſcarcely demand mention as they contain only three ſpecies of the ſhell tribe. In the deſcription of another muſeum, that of the queen of Sweden, "Muſæum Ludovicæ Alricæ Reginæ;" Linnæus poſſeſſed a more favourable opportunity of treating on teſtaceology, as her majeſty's collection was particularly rich in ſhells; this work deſcribes 434 ſpecies of ſhells, and ſome do not ſcruple to affirm that it is the beſt of the

Linnæan productions on the ſubject of teſtacea; it appeared in 1764. In the interval between the times in which the two laſt mentioned works were publiſhed, Linnæus brought out a ſecond edition of the "Fauna Suecica," in which the number of ſhells deſcribed was augmented from ſixty to eighty-nine ſpecies.

The "Mantiſſa Altera" contains thirty-five ſpecies not deſcribed in the other works already mentioned. The "Fundamenta Teſtaceologiæ" is one of his lateſt tracts, and is to be found among the "Diſſertationes Academicæ."

Theſe are valuable books in a limited view, but the claſſification of ſhells in the "Syſtema Naturæ" from the nature of the undertaking is to be conſidered the moſt general of all the Linnæan writings on the teſtacea. Between the year 1735, in which that work firſt appeared, and 1767, the Syſtema paſſed through no leſs than twelve editions, in all which a progreſſive improvement, and nearer approach to perfection are manifeſted, and in no one department is this more unequivocally ſhewn than in the methodical diſtribution of the ſhells.

An opinion is pretty generally prevalent that leſs attention was devoted by Linnæus to the hiſtory and arrangement of the teſtacea, than any other order of nature; and that he even thought them unworthy of becoming objects of ſcientific arrangement. Theſe points have been conteſted. The truth however ſtill appears to be, that Linnæus had not really beſtowed much critical attention on this ſubject. We can eaſily imagine that the mind of Linnæus might fluctuate between the propriety of eſtabliſhing his conchological ſyſtem upon the characters of the animals, and the difficulty, if not impoſſibility, of accompliſhing it, and that in this ſtate of indeciſion the ſhells themſelves were, in a great meaſure, diſregarded by him. When therefore the completion of the Syſtema required that ſome attention ſhould be paid to teſtaceology, he was unprepared, and reſorting to the authorities of others, compriſed this department in the ſmalleſt compaſs poſſible, more with the view of filling up a chaſm, which the omiſſion of a tribe ſo generally admired would occaſion, than from any idea of elucidating the ſubject.—A ſimilar reaſon is well known to have operated on the mind of Linnæus, with reſpect to his ſyſtem of mineralogy, which was added principally, in order that this work ſhould comprehend the three kingdoms of nature.

Whether this concluſion be correct or otherwiſe, one fact inferred is very obvious, that the early attempts at the claſſification of ſhells, which the Syſtema preſents, do not afford that happy reſult to be expected from the induſtry, and ſuperior genius, of Linnæus.—It is time we ſhould lay aſide the trammels of ſervile adherence, and ſpeak decidedly:—thoſe early attempts of this celebrated writer we do not ſcruple to ſay, if examined with candour, will be found only a ſlight and ill conceived compendium of what has been handed down to us by antecedent writers; and which, if he had more cloſely imitated in the outſet, as he afterwards found it incumbent upon him to do, would have reſcued his reputation as a conchologiſt from conſiderable blame. Can we for a moment, dazzled with the ſplendor of a name, however dignified, deny that merit which is ſo conſpicuouſly prominent in the claſſifications of preceding writers, and attribute all the credit of reducing ſhells into method and order to the genius of Linnæus? or can we, after duly eſtimating the teſtaceological labours, even of Geſner, Aldrovandus, and Major, we would almoſt ſay of Ariſtotle, be diſpoſed to commend this naturaliſt for overwhelming their arrangements in one common ruin; aboliſhing at the leaſt forty excellent genera eſtabliſhed by the different writers, and in lieu of thoſe preſenting us with eight genera for the reception of the whole teſtaceous tribe! Yet ſuch is the fact, the only genera of ſhells, included in the firſt editions of the Syſtema, are *cochlea*, *nautilus*, *cypræa*, *haliotes*, *dentalium*, *concha*, and *lepas*.

Linnæus was himſelf embarraſſed in the diſtribution of ſhells into ſuch a ſmall number of genera; he even found it impracticable, and hence we perceive, in the later editions of that work, their number progreſſively augmenting till, in the laſt publication of the Syſtema, they were multiplied to thirty-five. Thus from time to time. as his acquaintance with ſhells became more general, we ſee him deriving new ſtrength and ſupport, in the aid of his own ſyſtem, from thoſe very ſources which, in the firſt inſtance, he too incautiouſly attempted to ſubvert; the genera afterwards admitted into the Syſtema, even to thoſe laſt adopted, being with ſcarcely an exception to the contrary, drawn from the labours of naturaliſts who wrote in the century preceding, or much before.

It is an opinion likewiſe founded in error, that we are indebted for the outline of this teſtaceological ſyſtem (conſidered in its moſt improved ſtate) to the native genius of Linnæus. No one will hazard the aſſertion, we ſhould conceive, who is in the ſlighteſt degree acquainted with the writings before-mentioned. His primary diviſions were ready formed to his hands. Let us examine further: in the outline of his ſyſtem, he divides all teſtaceous bodies into three principal orders, *multivalve*, *bivalve*, and *univalve*. If we take the univalves of Ariſtotle (retained by later writers under the title of turbinata), the bivalves of all writers, from the time of Ariſtotle incluſively, and the plurivalves of Major, invert their order, and we at once poſſeſs the complete outline of the ſyſtem attributed to Linnæus. Or we may refer with equal certainty to the principles of Major's ſyſtem alone, publiſhed ſixty years before the firſt edition of the Syſtema made its appearance, in which this inverted arrangement occurs preciſely, univalvia, bivalvia, and plurivalvia. Linnæus, therefore, it may be fairly inferred, was not the inventor of the ſyſtematic outline aſcribed to him, for it was long in uſe before his time.

If we next deſcend from the primary diviſions, or orders of the Linnæan ſyſtem to his genera, theſe ſtill are to be found in the ſame, or other early writers, perhaps a ſolitary tranſpoſition (as in conus and ſtrombus) excepted, and furthermore even under the very names he aſſigns to them. His obligations to the labours of Langius are too obvious to be concealed. But although, in this particular, Linnæus has only the more moderate merit of adopting, inſtead of inventing the outlines of his ſyſtem, he is to be applauded for having condeſcended to ſelect what it appears he thought, on mature deliberation, ſuperior to his own. And this, in our idea, was ſo far commendable, that we regret he had not been influenced by the ſame opinion in his firſt views of a teſtaceological claſſification. Linnæus had aſſuredly much diffuſe and ambiguous matter to wade through in his inveſtigations of former ſyſtems in general, and his ſelections were at length both clear and judicious, though ſtill ſuſceptible of much improvement. We are alſo to give the celebrated naturaliſt his full ſhare of credit for having ultimately improved, and more accurately defined, the characters of the reſpective genera which he has adopted, than any of his predeceſſors; the characters of his ſpecies alſo, generally ſpeaking, are not to be excelled for expreſſive ſimplicity and conciſeneſs. He may be truly ſaid to have reformed the language of natural ſcience, before much too vague, by the introduction of that peculiar brevity of ſtyle, ſo extremely uſeful in the nice diſcrimination of natural objects, and which he ſeldom fails to apply with the happieſt poſſible effect.

The merits of Linnæus, as a great naturaliſt, will ſhine with undiminiſhed ſplendour, diveſted of its meteorous luſtre: the world feels grateful to his genius. But nothing leſs than an acquieſcence unworthy of his character, and of ourſelves, can lead us to conclude he was equally ſucceſsful in all his endeavours to develope the myſteries of nature. For our own part, attached to no particular ſyſtem, we would rather "ſtem the torrent alone, than glide down the ſtream with many," in contradiction to the evidence of our own mind; we are the friends of Linnæus,—and of truth. We are perſuaded, furthermore, that what the reſult of calm inveſtigation approves, muſt redound more to the credit of Linnæus than that implicit obedience which bows down our reaſon, and rejects inquiry. The celebrity ſo deſervedly acquired by his writings in general, has ſtamped his ſyſtem of teſtaceology with repute. Its reputation induces us to examine it with more than ordinary attention. It is in England, what that of Lamarck's is in France, and ſome others in different parts of Europe; the ſyſtem beſt known, and the moſt admired. We ſhall for this reaſon take a comprehenſive view of the whole, regarding every genus ſeparately in the ſame order as Linnæus places them; and offering, as we proceed, a few curſory remarks on each, with a view to enable the common reader to form his own opinion, and judge for himſelf of the comparative excellence or ſuperiority of the Linnæan ſyſtem of teſtaceology.

The primary diviſions of this ſyſtem, in the lateſt edition of the "Syſtema Naturæ," as before obſerved, conſiſt of three orders, *multivalve*, *bivalve*, and *univalve*, each of which is ſubdivided into genera. The *multivalves* contain the chiton, lepas, and pholas; the *bivalves*, mya, ſolen, tellina, cardium, mactra, donax, venus, ſpondylus, chama, arca, oſtrea, anomia, mytilus, and pinna; and the *univalves*, argonauta, nautilus, conus, cypræa, bulla, voluta, buccinum, ſtrombus, murex, trochus, turbo, helix, nerita, haliotis, patella, dentalium, ſerpula, teredo, and ſabella.

Genera.

Chiton. Animal a doris. Shell conſiſting of ſeveral tranſverſe incumbent valves, diſpoſed in a longitudinal ſeries down the back.

Our knowledge of this genus was very confined till within the laſt few years; ſo lately as the period in which the tenth edition of the Linnæan "Syſtema Naturæ" appeared, only four of its ſpecies were known, at leaſt no greater number is deſcribed by that writer. To the valuable work of Chemnitz, we are indebted for the addition of thirteen other ſpecies; to Schröetter, for three or four; and to Pennant for nearly an equal number; all of which are included in the laſt edition of the "Syſtema Naturæ à Gmelin," with a few others, amounting altogether to twenty-eight ſpecies. Though we are pleaſed to ſee ſuch a number of this curious genus, concentrated in one point of view, we cannot avoid expreſſing a wiſh that ſome few of the ſpecies at leaſt were better explained, thoſe eſpecially which are confined to the continental muſeums; one, if not more of the ſpecies deſcribed by Pennant, is confeſſedly erroneous.

Lepas. Animal a triton. Shell affixed at the baſe, and conſiſting of many unequal valves. Linn.

The propriety of ſeparating the balani, or acorn ſhells, from the anatiferæ, or as vulgarly denominated the "gooſe bearing ſhell," has never yet been queſtioned by any well-informed naturaliſt, although from motives of caution we, have, with others, ſubmitted to the genus eſtabliſhed by Linnæus, till our reaſons for diſſenting from his authority (and which the Linnæan ſtudent might deem an innovation) could be explained in its proper place.

We were always at a loſs to ſee the true reaſon that could induce Linnæus to place theſe two very oppoſite natural families together; the only juſtification ſeems to be, that the animals of the two genera (for ſo we ſhall denominate them) are of the triton kind, and that no other multivalve ſhells are inhabited by this kind of animal, that of chiton being a doris, and of pholas an aſcidia. At the ſame time, it will be remembered, that animals of the ſame kind inhabit ſhells of very different genera, and that it is therefore no argument, becauſe all of the Linnæan genus lepas are inhabited by the triton, that they muſt be of the ſame genus. We cannot ſurely infer this from any ſimilitude in the ſtructure of the two kinds of ſhells. What, for inſtance, can be more diſſimilar than the firſt very eſſential particular in which theſe ſhells diſagree, namely, the manner in which they are affixed; the balani cemented immoveably by its baſe to the rocks, looſe ſtones, or any other extraneous ſubſtances, while the anatiferæ are connected to, and ſupported at their baſe by a tendinous tube, which being of a flexible nature, allows the animal an opportunity of writhing or turning in any direction in queſt of food. Again, the very ſtriking circumſtance, which Linnæus had always himſelf regarded as of the firſt conſequence in an arrangement of ſhells, the preſence and abſence of the operculum: in the anatiferæ, there is no operculum whatever; while, in the balani, that part conſtitutes one of the principal features of the ſhell; it is even the ſtructure, rugoſity, or other peculiar circumſtances obſervable in this part, that afforded Linnæus the beſt of his characters, in defining the ſpecies of this family. This operculum or lid of the balani conſiſts of four or ſix valves. The above characters are ſo obviouſly diſtinct, that it may be almoſt conſidered needleſs to advert to the form of the two ſhells, though in this alſo they differ moſt eſſentially; the anatiferæ are wedge-formed, and conſiſt of five or more unequal valves; the balani of ſix valves, and the general form of the ſhell is ſubconic.

Pholas. Animal an aſcidia. Shell bivalve, divaricated, with ſeveral leſſer, differently ſhaped, acceſſory ones at the hinge; hinges recurved, and united by a cartilage; an incurvated tooth in the inſide beneath the hinge.

Theſe ſhells were formerly called piddocks by the Engliſh; they are found below high-water mark burrowed in hard clay, lime-ſtone, or ſometimes free-ſtone, and alſo wood; which they perforate in their younger ſtate, and as they increaſe in ſize enlarge their habitations. The animal is ſomewhat cylindrical in form, and is furniſhed with two orifices or openings, capable of elongation in the manner of a proboſcis; from one of which, ſuppoſed to be the mouth, it has the faculty of ſquirting water. The phoſphoreſcent properties of the pholade are very remarkable; it contains a liquor which ſhines with uncommon ſplendour in the dark, and illuminates whatever it touches, or happens to fall upon. This is noticed by Pliny, lib. ix. c. 61, and M. Reaumur has alſo written copiouſly on this ſubject, in the Memoirs of the French Academy, for the year 1712.

Only twelve ſpecies of this genus are deſcribed in the Gmelinian Syſt. Nat. The pholades were placed by Linnæus among the bivalves.

Mya. Animal an aſcidia. Shell bivalve generally gaping at one end; hinge, with a ſolid, thick, patulous tooth, or ſeldom two, and not inſerted in the oppoſite valve.

Many of the ſhells in this genus were arranged with the muſcles till Linnæus ſeparated them; Gmelin in the laſt edition of the Syſtema Naturæ deſcribes twenty-one ſpecies of the mya tribe.

The Linnæan myæ conſtitute three diſtinct genera, in the lateſt arrangements of the continental writers, as mya, glycimeris, and vulſella. The mya is diſtinguiſhed by a tranſverſe ſhell gaping at the two ends, and having the ligament within; and one valve furniſhed with a ſingle, compreſſed, roundiſh tooth in the beak, perpendicular to the valve, and having the ligament attached to it. The Linnæan mya truncata is of this kind. In the genus glycimeris the ſhell is alſo tranſverſe, and gaping at both extremities, but the hinge is callous and toothleſs, and the ligament ſituated on the outſide. Vulſella has the ſhell long and ſomewhat equivalve; hinge callous, depreſſed, without teeth, and forming a ſtraight line in both valves; the ligament attached to a roundiſh conic hollow; beaks bent and very ſhort. This laſt genus is cloſely allied in many reſpects to the oyſter.

Solen. Animal an aſcidia. Shell bivalve, oblong, open at both ends; hinge with a ſubulate reflected tooth, often double, and not inſerted into the oppoſite valve.

Gmelin deſcribes twenty-three ſpecies of this genus, ſeveral of which are natives of Europe, where they frequent ſandy ſhores. The Greeks were acquainted with ſome ſhells of this genus, as were alſo the Romans, both of whom valued the fleſh of the inhabiting animal as a dainty. In England they are occaſionally eaten either boiled or fried with eggs, but are not found in ſufficient plenty to be conſidered as an article of food. They are called ſheaths or razor-ſhells in this country.

The Linnæan ſolens are divided by late writers on the continent into three different genera, two of which comprehend the recent kinds, the third is eſtabliſhed chiefly for the reception of ſome foſſil ſhells, ſuppoſed to be of this Linnæan family. Thoſe genera are ſolen, ſanguinolaria, and corbula.

The ſolens, according to thoſe writers, have the ſhells tranſverſe, with the upper and lower margins almoſt ſtraight, with beaks not projecting and gaping at both extremities; and the two valves together furniſh either two or three teeth in the hinge: the ligament of the hinge in this family is placed on the outſide. Sanguinolaria differs in having the upper margin curved, the extremities a little gaping, and two approximate teeth in each valve, which lock into each other when the ſhell is cloſed. Corbula has the valves unequal, ſub-tranſverſe, and regular; with a conic curved tooth in each valve; the ligament of the hinge within, and the inſide of the ſhell marked with two muſcular impreſſions.

Tellina. Animal a tethys. Shell bivalve, generally ſloping on one ſide; in the fore part of one valve a convex, of the other a concave fold; hinge with uſually three teeth, the lateral ones ſmooth in one ſhell.

In the Linnæan ſyſtem the tellinæ are divided into three families, namely, * ovate and thickiſh, ** ovate and compreſſed, *** ſub-orbicular.

A late writer (Dr. Pultney) obſerves, in his "Catalogue of Shells found on the Coaſt of Dorſetſhire," that the tellinæ genus is one of thoſe of which the ſpecies are yet very imperfectly defined, ariſing from the great ſimilitude among them; and from the inſufficient deſcriptions of authors before Linnæus wrote, who, by deducing their characters of the genus, if indeed ſuch they might be called, almoſt wholly from figures, were neceſſarily led to throw together ſhells entirely different, when examined by the characters Linnæus affixed. Thoſe of this great maſter, adds this writer, are yet very imperfect, and ſince the great additions that have been made to conchological ſcience, by later diſcoveries, the whole ſyſtem again wants a total reformation: and the conſtruction of many new genera. The obſervation of this naturaliſt is very juſt; the writers before the time of Linnæus have, with too little caution, derived their characters from figures rather than from the ſhells, a fault we could have wiſhed Linnæus himſelf had more frequently avoided; the tellina of Linnæus is a good genus, but requires to be recaſt; ſome of the ſhells included by this genus have certainly no natural affinity whatever with the others, and the character of the genus itſelf is not laid down with ſufficient preciſion.

Liſter is one of the firſt conchologiſts who deſcribes the tellens with any degree of accuracy: he defines them to be "ſhells ſhaped like wedges," and places them after the pinna, (lib. iii. hd. 2. ſect. 8.) Woodward ſays they have a few teeth on the hinge, and are oblong ſhells, or with the ſides lengthened. Davila comprehends the tellens as a very large family, and includes the ſolens as a genus of them. Da Coſta, in his "Elements of Conchology," attempts to eſtabliſh a family of tellens under the character of the ſhells being more broad than long, rather flat, and the hinge having two teeth ſet cloſe together. This conſtitutes his ninth family of bivalve ſhells; and which he again divides into two genera, the firſt of which he ſtill calls tellina, and the ſecond cunei; his tellinæ are thus defined, "ſhells with ſimilar ſides, whoſe beak and hinge are central;" his cunei "ſhells with diſſimilar or unequal ſides, whoſe beak and hinge are placed near to, or quite at one end."

There is much method, but very little accuracy, or attention to genera, founded on natural affinities and characters, in the arrangements propoſed. It was reſerved for later writers, by a more ſtrict inquiry into the nature and habits of the animals, as well as the nice diſcrimination of characters in the ſhells themſelves, to fix upon deciſive general diſtinctions. It has been diſcovered by Poli, and others of the continental writers, that the animals inhabiting ſome of the tellen tribe are of a different ſtructure from the others; and another objection to the tellinæ, as they now ſtand in that genus, is the diſſimilitude obſervable in the hinge, teeth, and other parts of the ſhell, which Linnæus has himſelf thought eſſential to be regarded in conſtituting genera. The principal of the new genera eſtabliſhed by the lateſt of the French writers are *Cyclas* (cyclade) of Lamarck, and *Pandora* (pandore) of Latreille, the animal of which was previouſly diſcovered by Poli; the ſhell is alſo deſcribed by Linnæus under the name of *Tellina inequivalvis.*

The tellina genus, as now defined, conſiſts of thoſe bivalve ſhells which are orbicular, or tranſverſe, having a regular fold or rumple at the anterior end of the ſhell, with one or two teeth pointed to the beaks; and remote lateral teeth. This will comprehend the true tellinæ. The cyclas is of the Linnæan tellinæ, and is exemplified in the *Tellina cornea* of Linnæus and Pennant. This genus is of a ſub-orbicular form, without a regular fold or rumple at the anterior end; the ligament of the hinge is inflated, and projects out; it has either two or three teeth pointing to the beak, and lengthened lamelliform, or plate-like lateral teeth, which are received into ſockets in the oppoſite valve. The genus pandora, as above intimated, is formed principally of that ſingular ſhell the tellina inæquivalvis. This genus is unequivalve and unequilateral, one valve being convex, the other flat, with flattened ſummit; two unequal diverging teeth at the hinge, pointing to the beak in the upper valve, and two hollows in the lower; ligament within, and the inſide of the ſhell marked with two muſcular impreſſions.

CARDIUM. Animal a tethys. Shell bivalve, nearly equilateral, equivalve, generally convex, longitudinally ribbed, ſtriated, or ſulcated, with the margin dentated. Hinge with two alternate teeth in the middle near the beak, in moſt incurved; lateral teeth remote, and inſerted or locking into the oppoſite.

Forty-nine ſpecies of this genus are deſcribed in the laſt edition of the Syſtema Naturæ.

Da Coſta, in his "Elements of Conchology," propoſes to eſtabliſh a new family of cockles, under the title of pectunculus, whoſe character is a curved or ſemilunar hinge ſet with either two or four teeth. Theſe he divides into three genera. Genus 1. *Pectunculi*, or cockles, with a convex or flattiſh ſhell, of a roundiſh ſhape, with ſimilar or diſſimilar ſides, whoſe beaks are not very prominent, and curve much upwards towards the hinge; they are the *Chamæ* of Argenville and Gualtieri; and do not belong to any particular genus in the Linnæan ſyſtem, but are diſperſed throughout his bivalves, and are only mentioned here to introduce the two next genera. Genus 2. *Cordiformes*, or heart-ſhaped cockles, whoſe beaks are not very prominent, and curve up greatly towards the hinge, thereby forming a figure perfectly like a heart as vulgarly painted. Theſe are ranked by Linnæus in the cardium genus, and are thoſe, ſtrictly ſpeaking, of which his genus is chiefly compoſed. Genus 3. *Truncati*, or flat-ſided cockles. Theſe laſt are ſuch cockles as are flattened, or have a truncated appearance on one ſide, as we ſee exemplified in cardium medium.

The cardium genus, as laid down by Linnæus, is far from exceptionable. It is adopted by the beſt continental writers, under the title of *Cardium bucarde, Cœurs, Conchæ cordiformes*, and other ſignificant appellations, alluding to the heart-ſhaped appearance which the ſhells exhibit, in a greater or leſs degree, when viewed ſideways. Theſe ſhells are of a ſomewhat cordiform ſhape, with the valves denticulated or folded at the margin; beaks contiguous; hinge with two oblique teeth in each valve near the beak, locking into each other; lateral teeth remote, and fitting alſo into each other.

MACTRA. Animal a tethys. Shell bivalve, unequilateral; valves equal; middle tooth of the hinge complicated, with a ſmall hollow on each ſide, and lateral remote teeth inſerted into each other.

Twenty-ſeven ſpecies of this genus are deſcribed by Linnæus and Gmelin. Lamarck propoſes to divide the Linnæan mactra into two genera, *mactra* and *lutraria*; both ſhells are unequilateral, and gaping at the ends, but the conſtruction and ſituation of the teeth are very different, as we ſee elucidated moſt completely by comparing the mactra ſtultorum of Linnæus with the mactra lutraria of the ſame author.

DONAX. Animal a tethys. Shell bivalve, with the margin in general crenulated, the anterior end very obtuſe; hinge with two teeth, a ſolitary one ſomewhat remote (the latter rarely double, triple, or none). Linn.

This genus, in the Linnæan ſyſtem, contains nineteen ſpecies. The donax of the modern continental naturaliſts is rather differently defined; they deſcribe it as a tranſverſe ſhell, with the ſides unequal, a little gaping at both ends, and having two muſcular impreſſions on the inſide of the ſhell; two teeth pointed towards the beaks in one valve, and a ſingle bifid tooth diſpoſed in a ſimilar manner in the other; and the ligament of the hinge on the outſide. This character agrees with the *Donax rugoſa* of Gmelin. Another genus is eſtabliſhed under the name of petricola, the character of which is exemplified in the Linnæan *Donax irus*, and *Venus lapicida* of Chemnitz. The ſhells of this new genus are unequilateral, a little gaping at both ſides, and having two muſcular impreſſions in the inſide of the ſhell: two teeth pointing towards the beaks in one valve, and a ſingle bifid tooth in the other; with the ligament of the hinge on the outſide.

VENUS. Animal a tethys. Shell bivalve, anterior margin with incumbent lips; hinge with three teeth, all which are approximate, the lateral ones divergent at the tip; "vulva et anus diſtincta." Linn.

Theſe are divided by Linnæus into two ſections; * pubentes, and ** impuberes, the laſt of which is ſubdivided into three families, † ſubcordatæ, †† orbiculatæ, and ††† ovales, ſupra rimam ſubangulatæ. The total number of ſpecies deſcribed in the "Gmelinian Syſtema," amounts to one hundred and forty-five. It is chiefly in the deſcriptions of the ſhells of this genus that Linnæus has adopted terms which we do not feel at liberty to render into common language for the peruſal of the general reader.

Many of the ſhells of this genus were arranged by writers previous to the time of Linnæus under the title of chama. The animal is deſcribed as a tethys differing from that of the cardium, chiefly, in having the foot of the animal when protruded lamina-formed, inſtead of hooked, and as a molluſcous animal, taking a variety of forms when the creature moves. It ſhould however be obſerved that we are yet very imperfectly acquainted with the animals inhabiting this extenſive tribe of ſhells.

SPONDYLUS. Animal a tethys. Shell with unequal valves, hard, and rigid; hinge with two recurved teeth, and a ſmall hollow between.

The Linnæan ſpondyli are few in number, the laſt edition of the "Syſtema Naturæ," comprehending no more than four ſpecies. The ſpondyli have been by ſome called thorny oyſters. Rumphius, Argenville, Seba, and Davila, rank them as oyſters; while Liſter, Woodward, Gualtieri, Linnæus, Meuſchen and Da Coſta conſider them as a diſtinct genus, under the name of ſpondylus. The ſpondyli are either earleſs or furniſhed with ears; the valves uneven, thick, and rude or uncouth, and forming in their general exterior an intermediate natural family between the oyſter an deſcallop. Lamarck, and other late French writers, divide the Linnæan ſpondyli into two genera, *ſpondylus* and *plicatula*. One eſſential diſtinction between theſe ſhells conſiſts in the ſpondylus having ears, and the plicatula being without; but this is not the only difference, a ſtriking character is drawn from the ſtructure and appearance of the beak of the lower valve, which projects beyond the beak of the upper one, and in ſpondylus exhibits a plain triangular flat ſpace, divided by a furrow: while in the genus plicatula the beak has no ſuch characteriſtic ſpace or flat ſurface, and the edges are rumpled or folded. Theſe new genera are well exemplified in the two Linnæan ſhells, ſpondylus gaedaropus, and ſpondylus plicatulus.

CHAMA. Animal a tethys. Shell bivalve, rather coarſe; hinge with a callous gibboſity, obliquely inſerted into an oblique hollow; anterior ſlope cloſed (valva clauſa abſque nymphis, Linn.)

In Da Coſta's "Scheme of Shells," the Linnæan chamæ are divided into two genera, tridacnæ or baſon conques, and chamæ or gapers. The tridacnæ are ſhells of equal valves, and diſſimilar ſides, in hinge and appearance like the heart cockles, but on the longeſt ſide from the beak to near the extreme margin the two valves are open, leaving a large oval or heart-ſhaped gap, the lips of which are very broad, and turn upon the edges. The chama gigas of Linnæus is of this family, and is the largeſt and heavieſt ſhell at preſent known, weighing from ſix to ſeven hundred pounds. The chamæ, or gapers, alſo called purrs, have a broad, thick, and large tooth at their hinge, and are abruptly cut off on one ſide, which ſide is always open or gaping.

The genus tridacna is retained by the lateſt French writers, with ſome amendment in the definition of the character. They deſcribe it as an equilateral and ſubtranſverſe ſhell, with two compreſſed teeth in the hinge, and the lunule at the poſterior ſlope gaping. The chamæ of theſe authors are adherent to other bodies, and have the valves unequal, and the inſide of each marked with two muſcular impreſſions; and the hinge conſiſting of a ſingle thick oblique tooth. Hippopus, cardita, and iſocardia, are alſo new genera formed of the Linnæan chamæ; the laſt is an excellent genus, founded on the peculiar ſtructure of the chama cor of Linnæus: this ſhell is heart-ſhaped, with the valve unequal at the ſides; the beaks diverging ſomewhat ſpirally and remote; in one valve under the beak a flat tooth, locking horizontally between two in the valve oppoſite, and a ſingle diſtant tooth in the anterior part, below the ligament.

ARCA. Animal a tethys. Shell bivalve, equivalve; hinge with numerous ſharp teeth alternately inſerted between each other.

This genus is divided into two principal families, thoſe having the margin entire, and thoſe with the margin crenated; and both families are again ſubdivided into two ſections, the firſt diſtinguiſhed by having the beaks recurved, the other inflected; the ſpecies deſcribed altogether amount to forty-two.

This genus derives its name of arca, ark, or Noah's ark-ſhell, from the ſimilitude which moſt of the ſpecies bear when the valves are cloſed to a boat, or hull of a ſhip, "concha rhomboidalis naviculam exprimens." Liſter places ſome of theſe ſhells among the multarticulate cockles, and the reſt with the muſcles, under the title of many-toothed muſcles. Woodward ranks them among his "polyginglymi formâ oblongâ;" Argenville as a family of heart-cockles, and Davila and Gualtieri as a diſtinct genus: the firſt under the title of arca, the latter as "concha rhomboidalis." Theſe writers were ſucceeded by Linnæus, who conſidered theſe ſhells as a diſtinct genus, and called them arca.

The principal alteration in the Linnæan claſſification of the genus arca propoſed by late writers, is to retain only ſuch ſhells under the title of arca as are unequilateral, with the beaks remote; and have the line of the hinge ſimple and ſtraight throughout, with numerous teeth placed parallel to each other, and fitting or locking between thoſe on the oppoſite valve. Admitting this as the character of the arcæ, and it exactly correſponds with the arcæ noæ, and moſt others, the little ſilvery ark; arca nucleus of Linnæus, with its analogous ſpecies, is excluded. To comprehend the latter, a new genus is recently eſtabliſhed by the French writers under the name of nucule, or nucula, the character of which is remarkably deciſive: it is deſcribed as a triangular or oblong ſhell, with the ſides unequal; the hinge conſiſting of an angulated, or broken line beſet with numerous teeth, which are tranſverſe and parallel, and a ſingle oblique tooth placed under the beak, and out of the range of parallel teeth before mentioned. The beaks alſo, inſtead of being remote, as in arca noæ, are placed cloſe together, and turn backwards.

OSTREA. Animal a tethys. Shell bivalve, generally with unequal valves, and ſlightly eared; hinge without teeth, furniſhed with an ovate hollow, and moſtly lateral, tranſverſe furrows. "Vulva anuſque nullus," Linn.

Theſe are divided into three families, * valves radiated and eared, as in the ſcallops, * * rugged, or rough, as in the oyſter, * * * hinge with a perpendicular furrowed line, as in the ſpecies perna and iſognomum. The ſcallops are again ſubdivided into three ſections, namely, thoſe with the valves equilateral, and the ears equal; thoſe with the ears unequal, and having one of them generally ciliated with ſpines within; and thoſe with the valves gibbous on one ſide. The two other families are not ſubdivided.

The difference between the oyſter and the pecten tribe is ſo obviouſly impreſſed by the hand of nature on the reſpective ſhells which compoſe them, that few writers on this ſubject have paſſed ſilently over the impropriety of placing them together. If, however, we examine a number of the other ſhells included by Linnæus in the extenſive genus oſtrea, many will be found, which though leſs diſſimilar at the firſt view, equally deſerving of being conſidered generically diſtinct, as well as the two tribes before-mentioned. The form of the ſhell is ſufficient to guide us in an arrangement profeſſedly of ſhells; but when the peculiar ſtructure of the animal confirms the propriety of conſtituting new genera, no doubt can remain that ſuch amendment was requiſite. With reſpect to the oſtrea, the animals of ſeveral of its natural families are unknown; ſome of the oyſter and pecten tribe are, on the contrary, well aſcertained, and theſe are proved to be very diſtinct.

As Linnæus conſiders theſe animals the ſame, and deſcribes them as a tethys, it may not be improper to ſpeak more fully on this ſubject. The ſcallop differs from the oyſter in being endowed with a higher locomotive power: the animal is different in having the branchiæ cirrhated, or fringed; in being furniſhed with a kind of foot, which it protrudes from the ſhell near the auricle of the hinge; and in throwing out a byſſus like the pinna and the muſcle, by which it affixes itſelf to other bodies. Ariſtotle, and other ancient writers, attribute to the ſcallop the power of ſpringing from place to place, a fact pretty correctly aſcertained by the obſervations of the moderns. Argenville deſcribes the proceſs of its movements both in the water and out; he relates, that when left dry, by a ſudden and violent cloſing of its valves, aſſiſted by the foot, it has the power of ſpringing four or five inches at a jerk, repeating this motion in order to regain its element. In the water, it is aſſerted by this writer, the ſcallop has the power of riſing and ſuſtaining itſelf near the ſurface, turning about in various directions, and on any alarm ſuddenly cloſing the valves and ſinking to the bottom. The oyſter has the branchiæ ſimple, and not fringed, and is unfurniſhed either with a foot, or with byſſus; and its powers of motion conſiſt in turning either the flat or convex ſide upwards or downwards, and even to effect this, the animal takes advantage of the force of the ebbing or flowing of the water to aſſiſt it. Vide Dr. Pultney's Cat.—Liſter on Scallop, in Phil. Tranſ. &c.

Before the time of Linnæus, moſt writers conſidered the ſcallops and oyſters as diſtinct. Gualtieri deſcribes the ſcallops as a particular family, and divides them into two genera, or thoſe with equal, and thoſe with unequal valves; the firſt of which he calls *pecten*, the latter *concha pectinata*; and the ſcallops with unequal or ſingle ears, he calls *pectunculi*. The oſtrea is ranked as a diſtinct family by moſt authors. Da Coſta obſerves that the "head or eſſential character of the eſcallop family is a trigonal ſinus, and an elaſtic cartilage for its hinge in the very centre of the top of the ſhell." "The oyſters have unequal valves, though there are ſome ſpecies that have equal valves, but none are eared. The hinge of this family has not any teeth, but conſiſts of one large inarticulate gutter, running the length of the top of the ſhell, in both ſhells alike, and is covered and filled with a ſtrong cartilage." We ſhould add, that in the ſcheme of ſhells propoſed by this writer, the ſpondylus forms an intermediate genus between the pecten and oyſter.

In Lamarck's arrangement, the two genera, *huitre*, oſtrea, and *peigne*, pecten, are retained; but four other genera are conſtituted, under the names of *malleus*, *perna*, *lima*, and *pedum*, into which the Linnæan oſtreæ are diſtributed. Latreille forms another genus under the name of *gryphus*, the oſtrea gryphus of Linnæus, a ſhell found only in a foſſil ſtate. We are not excluſively indebted, however, to Latreille for the eſtabliſhment of this genus. Vide "Donov. Tour South Wales and Monmouthſhire;" in which the courſe of an immenſe ſtratum of theſe antediluvian ſhells is particularly deſcribed, with remarks on the genus oſtrea and gryphus.

ANOMIA. Animal, a ciliated ſtrap-ſhaped body, with briſtles or fringe affixed to the upper valve; arms two, linear, longer than the body, connivent, projecting, alternate on the valve, and ciliated each ſide, the fringe affixed to each valve. Shell inequivalve, one of the valves flattiſh; the other gibbous at the baſe with the beak produced, and generally curved over the hinge; one of the valves often perforated near the baſe; hinge with a linear prominent cicatrix, and a lateral tooth placed within, but in the flat valve on the very margin. Two bony rays for the baſe of the animal.

Many of the Linnæan ſpecies of anomia are found in a foſſil ſtate only, and rarely afford an opportunity of inſpecting their internal ſtructure; neither is it reaſonable to imagine we ſhall ever become acquainted with the animals by which they were inhabited. Our obſervations on theſe points muſt be confined to the recent kinds only, which, ſo far as they have been attentively examined, are found to comprehend ſhells extremely diſſimilar in ſtructure, and to be inhabited by animals differing in many eſſential particulars. It is remarked by Dr. Pultney, that the animal of the anomia is different from that of any other ſhell-fiſh, and is not reducible to any of thoſe in a molluſcous ſtate hitherto known. Hence, probably, the name Linnæus impoſed upon it, *Ανόμια*. "quaſi irregularis diſſimilis à lege diſcrepans." The animal of the anomia cepa is figured by Murray, in his "Fundamenta Teſtaceologiæ," t. 2. f. 23; and that of another ſpecies, by Forſkäl, in his "Icones Animalium," t. 6. 40. B. under the name of anomia tridentata. The diſſimilarity of theſe two renders it highly probable, that in the different ſhells which come under the appellation of this genus, the inhabitant animal is various. Linnæus deſcribes that of the anomia patelliformis as extending from its body a tongue-like proceſs fringed with fine hairs, and furniſhed with two extenſive ciliated arms, by which it is enabled to open and ſhut the ſhell. In the anomia tridentata, the animal is furniſhed with two flat, wedge-ſhaped, trilobated arms, placed oppoſite to each other; theſe it protrudes out of the ſhell when it moves, and they are the organs by means of which it ſwims in the ſea. Some other kinds of anomiæ are inhabited by animals which, it is ſuppoſed from the ſtructure of the ſhell, cannot open the valves to ſtretch forth arms, but are furniſhed with proceſſes of a different nature, which they protrude through the aperture or perforations at the beak; and other kinds again, inſtead of arms, have only a ligament paſſing through the perforations of the ſhell, by means of which it is firmly fixed to other bodies.

Columna is the firſt writer who ſpeaks of ſhells of this kind; he deſcribes ſome few of the foſſil tribe (the only ſpecies known in his time) under the title of "Conchæ rariores anomiæ." Hence the term anomia was afterwards employed by other writers, and has ſince become the univerſal name for this family of ſhells. Liſter figures ſeveral ſpecies of the foſſil kinds in his "Appendix de Conchitis" to his "Hiſtoria Conchyliorum". Woodward forms an arrangement of them under the name of anomia, ranking them with the ſhells of unequal valves, not eared, both valves convex, and one of them beaked, and theſe he divides into three families, the ſmooth, ſtriated, and ſulcated. Gualtieri figures ſome few of the recent kinds as a new genus under the title of terebratula. Argenville places ſome of the anomiæ among his heart cockles. Davila treats them as a genus of his oyſters; Da Coſta as a genus of bivalves with unequal earleſs valves, the beak of the largeſt or under valve greatly produced, and riſing or curving over the beak of the ſmaller or upper valve, which is pierced through like a tube: the hinge is in articulation toothleſs, and they have always a remarkable interior ſtructure. Theſe are the terebratulæ of ſome late writers, and comprehend only part of the Linnæan anomiæ.

Thoſe ſhells of the recent kinds among the anomiæ of Linnæus, which are moſt diſſimilar in ſtructure, are the ſpecies terebratula, placenta, and ephippium; each of which ſtands at the head of a natural family, and offers characters which may be adopted with facility as diſtinctions of ſo many genera. We are perſuaded the genera formed by the ſubdiviſion of the Linnæan anomiæ might be extended with much propriety to a greater number ſtill, but we are unwilling to increaſe them without the moſt abſolute neceſſity. With reſpect to the foſſil kinds of Linnæan anomiæ, ſome may be referred to the genera above mentioned, others are in no manner applicable to them, and for the arrangement of ſuch it is requiſite to form new genera. Lamarck propoſes one, calceola, derived from the characters of the anomia ſandalium of Linnæus, and his genus crania formed of the Linnæan anomia craniolaris may be conſidered as in a great meaſure appertaining to the foſſil ſhells only. Theſe genera are laid down with perſpicuity, but Lamarck we are perſuaded might have proceeded further. We conſider Linnæus oftentimes blameable for intermixing the recent and foſſil ſhells promiſcuouſly together, and may be therefore ourſelves excuſed ſometimes at leaſt for abſtaining from his example. Lamarck thinks differently; he approves this method, and having ventured from the boundaries of the preſent into the labyrinths of the antediluvian creation, much was expected; a greater number of new genera might have been eſtabliſhed, thoſe at preſent formed being altogether inadequate to the reception of thoſe numerous remains of the teſtacea which are admitted among the anomiæ by the Linnæan conchologiſt.

But to return to the recent anomiæ:—What, we would inquire, could poſſibly induce Linnæus to place that ſingular bivalve, called from its tranſparency by the Engliſh collector "the Chineſe glaſs window" among the anomiæ?—Or what again can be more remote than the eſſential character of his anomia ephippium and terebratula?—In the firſt, which is to be found in his Syſtema under the name of anomia placenta, both valves are of an equal ſize and form; in ephippium the valves are unequal, one being flat, and the other convex, as in the oyſter; in ephippium the flat valve is perforated with a round hole in the diſk near the hinge through which a ligament paſſes, and by this means affixed it to ſtones and other bodies; the A. placenta has no ſuch perforation. In A. terebratula there is a perforation; but inſtead of being ſituated in the flatter valve it appears at the tip of the long beak into which the head of the convex valve is elongated. Near the hinge in one valve of A. placenta are two longitudinal lamelliform proceſſes, which approach near the beaks, and thence diverge obliquely ſo as to reſemble the letter V, and upon the valve oppoſite two correſponding proceſſes longitudinally cleft, in which, when the ſhell is cloſed, two lamelliform teeth repoſe. An internal ſtructure of longitudinal proceſſes occurs in the ſpecies terebratula, but very different from the preceding, and no ſuch internal ſtructure occurs in the anomia ephippium. Theſe characters denote ſufficiently that they are not only eſſentially different in the conformation of their ſhell, but that they are inhabited by animals diſtinct from each other.

Mytilus. Animal an aſcidia? Shell bivalve, rough, uſually affixed by a beard or byſſus of ſilky filaments: hinge in general without teeth, and except in a few ſpecies with a ſubulate excavated, longitudinal line. Linn.

The Linnæan mytili are by no means inconſiderable in number, and as they comprehend many ſhells very diſtinct in appearance, and ſome eſſential particulars, are neceſſarily diſtributed into ſeveral ſections, or families, ſuch as * paraſitici, thoſe affixed by claws, exemplified in mytilus criſta galli; ** plani, &c, flat, or compreſſed into a flattened form, and ſlightly eared, as in mytilus margaritiferus; or *** ventricoſculi, ventricoſe, as in mytilus edulis. The older writers appear to be perfectly agreed as to the mytilus genus, but the moderns think it neceſſary to divide them into two or more genera. Lamarck ſeparates them into mytilus (moule), modiolus (modiole), and anodonta (anodonte). In defining the mytili he notices in particular the unguiculated, or claw-like termination of the ſhell at the narroweſt end as a peculiar character. We do not perceive the abſolute utility of his ſecond genus, modiole, though we think it admiſſible, but we perfectly agree in the adoption of the latter anodonta. This laſt mentioned genus conſiſts of what are vulgarly called the river, or freſh water muſcles, ſhells which we have always conceived it improper to refer to the ſame genus as the marine mytili. In the colour of the valves, and form and ſituation of the beaks, the moſt obvious diſſimilitude prevails, and a diſtinction ſtill more evident reſulting from the different conformation of the animal occurs in the inſide of the ſhell, which exhibits three impreſſions of muſcles or ligaments by means of which the animal is attached to the ſhells, while the ſhells of the common muſcle, and its congeneres, have only one ſuch impreſſion.

Pinna. Animal limax. Shell ſub-bivalve, fragile, erect, gaping, and furniſhed with a byſſus, or beard; hinge without teeth, the valves uniting into one. Linn.

This genus is well defined; the ſhells of which it conſiſts are wedge-ſhaped, or of a ſomewhat triangular form, widening from a pointed or narrow top to a very broad end. The hinge is inarticulate, the two valves being united in that by part, and thus forming, what Linnæus truly terms it, a ſub-bivalve, for it is not ſtrictly of two valves, being thus connected. The pinnæ are known by different writers under the various appellations of ſea-hams, ſea-wings, and pinnæ marinæ, or by others ſilk-worms of the ſea, which laſt they obtain from the quantity of fine ſtrong brown byſſus, which the animals produce, and by means of which they affix themſelves to the rocks; the byſſus conſiſts of fine ſilky fibres of a brown colour, and which is eaſily woven into ſtuff or ſmall articles of dreſs. Among the ancient Romans this kind of ſilk was held in conſiderable eſteem: it is even ſaid that there are ſtill manufactories of it at Naples, Meſſina, and Palermo.

Eighteen ſpecies of this genus are deſcribed in the laſt edition of the Syſtema Naturæ.

Argonauta. Animal ſepia, or clio. Shell univalve, ſpiral, involute, membranaceous, and unilocular, or conſiſting of a ſingle cell. Linn.

The principal ſpecies in this genus of ſhells is the Linnæan argonauta argo, the celebrated nautilus of Pliny, lib. ix. 29, the animal ſuppoſed to have taught men the uſe of ſails, and art of navigation in the early ages of ſociety. The ancients knew this ſpecies by the name of nautilus, as appears ſufficiently obvious from many paſſages to be found in their writings. Linnæus, however, in conformity with Rumphius, applies the name of nautilus to a chambered ſhell of a very different kind, (ſee Nautilus), and retains the nautili of the ancients, under the title of argonauta, with the eſſential character above-mentioned.

In the Gmelinian edition of the Syſtema Naturæ, the number of ſpecies deſcribed under the genus argonauta amount to five, argo, vitreus, cymbium, cornu, and arctica. But the minute obſerver of nature diſpoſed to deſcend to the inveſtigation of the microſcopic kinds of ſhells will be able to add conſiderably to this number; a work publiſhed in Germany in 1798, the united labours of our friend L. A. Fichtell, and C. A. Moll, and entitled "Teſtacea Microſpica aliaque minuta ex generibus Argonauta et Nautilus ad naturam picta et deſcripta," contains in particular, a number of new ſpecies in this curious genus, and a few others are known to us which we have reaſon to apprehend have not been noticed by any other writers. By the acceſſion of theſe latter ſpecies the genus becomes materially enlarged; but we have, at the ſame time, to obſerve that the whole of the Gmelinian ſhells, deſcribed under this generic title, are not ſtrictly admiſſible among the argonautæ, and that the removal of theſe will occaſion a ſlight reduction of the ſpecies already mentioned.

That very rare ſhell known among collectors by the name of glaſſy nautilus, the argonauta vitreus of Gmelin, is ſeparated by Lamarck from argonautæ, and conſtituted a new genus under the name of carinaria. In the Linnæan ſyſtem it would be difficult to refer it with certainty to any genus. Linnæus was himſelf in doubt where to place it, and at length referred it to the limpet tribe, under the name of patella criſtata, but it cannot ſurely belong to this genus. In the laſt edition of the Syſtema Naturæ, we ſee it tranſpoſed from thence to the argonautæ with more propriety, but we are ſtill perſuaded it cannot claim a place in this genus, though it is more cloſely allied to it than any other of the Linnæan genera; it is certainly of a new genus as Lamarck deſcribes it. The principal diſtinction between thoſe two genera, the argonauta and carinaria, is very ſtriking; in the true argonauta, (or nautilus of the ancients) the ſpiral involution turns into the opening of the ſhell, whereas in carinaria, the ſpire is ſituated at the ſummit of the ſhell and the mouth is entire. This character we think alone ſufficiently deciſive in defining the eſſential characters of the two genera. The carinaria is further diſtinguiſhed by the ſhell being conic, and flattened at the ſides, the ſpiral whorl very ſmall, the back furniſhed with a ſingle denticulated keel, and the mouth, or aperture of the ſhell, of an oval-oblong form, narrower neareſt the angle of the keel. The argonauta ſhell, inſtead of being conic, is ſomewhat boat-ſhaped, and has from this very circumſtance been named cymbium, both by Gualtieri and Teſſin; and the dorſal carination which is ſingle and denticulated in carinaria, is uniformly double and tuberculated in argonauta.

In concluſion of our remarks on this genus, it will be proper to obſerve that the glaſſy nautilus, or carinaria vitrea, is one of the moſt choice and uncommon of the teſtaceous tribe;

it is not, however, unique, for we know of three ſpecimens, one of which is in the cabinet of Mr. Jennings in England, and the two others in the Muſeum of Natural Hiſtory in Paris, one of which was obtained from Lyonet's cabinet. A large foſſil ſhell of the argonauta genus, a ſingular ſpecies, and the only one we are acquainted with, occurs in the London Muſeum.

NAUTILUS. Shell univalve, divided into ſeveral departments, communicating with each other by an aperture or ſiphunculus.

The Linnæan nautili conſiſt of two principal families, thoſe which are ſpiral and rounded, and ſuch as are elongated and ſtraight. Of the ſpiral kinds there are two diſtinct ſections, the firſt of which have the whorls contiguous, the other the whorls ſeparated; the nautili of a ſtraight form are comprehended in one ſection only.

Under the general title of nautilus, Linnæus includes the three genera of modern naturaliſts, nautilus, ſpirula, and orthocera, with ſome others which may hereafter, on accurate inveſtigation, be found generically diſtinct likewiſe. The nautilus is a ſpiral rounded ſhell, having the laſt whorl very large, and enveloping the others, which are numerous, and divided internally into many chambers by tranſverſe partitions, the diſk of which is perforated by a ſiphunculus or tube. This character is drawn from the nautilus pompilius of Linnæus, a ſhell admitted by the lateſt authorities as an amplification of the nautilus genus; of the modern ſchool only we would obſerve, for it has been previouſly ſhewn, under the genus argonauta, that it is not the nautilus of the ancients. The character of the new genus ſpirula, is derived from the nautilus ſpirula of Linnæus, (erroneouſly rendered ſpicula in Gmel. Syſt.) or what we call the ram's horn. This ſhell is truly of the lituus or crozier family, being of a ſpiral ſtructure with the whorls ſeparated, and the laſt chamber at the aperture elongated into a ſtraight cylindrical ſtem. Linnæus deſcribes only the ſpiral termination of the ſhell, which being of a concamerated or chambered ſtructure, and perforated with a ſiphunculus; induced that naturaliſt to place it with the nautili, notwithſtanding the ſtriking diſſimilarity of the diſpoſition of the ſpiral involutions. This ſhell, when perfect, affords an eſſential character which at once removes it from the genus nautilus, in which Linnæus places it; namely the laſt or cylindrical chamber, which is alone ſufficient to diſtinguiſh it. We may eaſily preſume that no blame attaches to Linnæus in this particular reſpect, for it is pretty certain that naturaliſt never ſaw the perfect ſhell. In collections we have at various times ſeen ſome thouſands of the ſpiral terminations, (for it is a very common Weſt Indian ſhell,) ſcarcely one of which has retained the ſlighteſt veſtige of this chamber, though all appear rudely broken, and different from a natural termination or aperture. This chamber of the ſhell is extremely thin and brittle, inſomuch that the ſlighteſt agitation of the waves will deſtroy it, and as thoſe ſhells inhabit the deep waters, and are collected by the curious only from the *rejectamenta* of the ſea caſt upon the beach in ſtorms, it is natural to conclude that it is rarely ſeen complete. It was not till of late years that the true form of the perfect ſhell appears to have been aſcertained. The orthocera is the orthoceros of Gualtieri and Breynius revived. This ſhell is ſtraight or arched, and a little conic, with diſtinct chambers formed by tranſverſe ſimple diviſions perforated by a tube, which is ſometimes placed centrally and ſometimes laterally. We are of opinion this amendment would be improved by forming two genera of the orthocera, one containing the ſtraight and the other the arcuated kinds; and indeed we conceive ſtill further that thoſe, with the ſiphunculus placed on one ſide, ſhould form a diſtinct genus from thoſe having the ſiphunculus in the centre. The Linnæan character of the nautilus confounds all theſe diſtinctions; they are all nautili of that writer.

Among the teſtaceological remains of the antediluvian world, are many ſingular ſpiral ſhells, allied to, or of the ſame genera with the foregoing, and others which, though ſpiral and concamerated, cannot poſſibly be reduced to theſe tribes; ſuch as the ammonites, the orbulites of Lamarck, hélicite of Guettard, baculites of Faujas, and the belemnites, or "thunder-bolts," of moſt authors. See article FOSSILS.

CONUS. Animal a limax. Shell univalve, convoluted, and turbinated; aperture or opening effuſe, longitudinal, linear, toothleſs, with the baſe entire; pillar ſmooth.

This genus is divided into five diſtinct families. * Truncati, having the ſpire nearly truncated. ** Pyriformes, with the baſe rotundate and ſub-cylindrical; the cylinder half as long again as the ſpire. *** Elongati, with the baſe rotundate, cylinder twice the length of the ſpire. **** Ventricoſe in the middle, and narrow at each end. ***** Ventricoſe; emits a tinkling ſound, when thrown on its back upon a board or table. The total number of ſpecies included in this genus, in the laſt edition of the Syſtema Naturæ, amounts to ſeventy-one. Many of the conus, or cone tribe, are beautiful ſhells, and bear a high price on account of their rarity; the cedo nulli of Lyonet, valued at one hundred guineas, is of this genus. We have no ſpecies of this genus upon the Engliſh coaſts. Some very curious kinds have been diſcovered in a foſſil ſtate in England, chiefly in the chalk cliffs of Hampſhire.

CYPRÆA. Animal a limax. Shell univalve, involuted, ſubovate, obtuſe, and ſmooth; aperture effuſe at each end, linear, dentated at both ſides and longitudinal.

Linnæus forms ſeveral diſtinct families of the cypræa genus, one of which is diſtinguiſhed by being obtuſe, and without any manifeſt ſpire; ſuch, for example, as the ſpecies caput ſerpentinus and tigris, the laſt of which is well known by the name of tiger cowry; another kind is perforated, or furniſhed with an umbilicus, as in cypræa ziczac; and a third ſort is margined like the common Weſt India cowry, vulgarly called "blackmoor's teeth," cypræa moneta of Linnæus. In the young ſtate, the cyprææ have much the appearance of a volute, and are entirely deſtitute of the thick denticulated lip or margin, ſo obvious in the adult ſhells. Writers have been even ſo far miſled by this ſpecious appearance, as to deſcribe the young of ſeveral kinds for ſhells of the volute genus. The voluta jonenſis of Pennant's Britiſh Zoology, is clearly nothing more than the young of the common Engliſh cowry, cypræa pediculus, which that writer miſtakes for a perfect ſhell.

BULLA. Animal a limax. Shell univalve, convoluted, and unarmed with teeth; aperture ſomewhat ſtraightened, oblong, longitudinal, and very entire at the baſe; pillar lip oblique and ſmooth.

The arrangement of the bulla family is very confuſed in the works of the old writers. Liſter makes them a genus of the cowry, and calls it concha veneris baſi umbilicatâ. Grew and Bonanni place it with the ſnails; Argenville and Davila with the cochleæ globoſæ; and Gualtieri as a genus between the paper nautili (argonauta) and the cowries. The term bulla implying the bubble-like form, or ſwollen appearance of the ſhell, was applied by Rumphius to the bulla ampulla, from whom it was adopted by Klein, and afterwards by Linnæus as a generic appellation. The ſhells included by this laſt-mentioned writer under the name of bulla, are more than commonly anomalous in habit and form; few inſtances can be adduced of greater diſſimilarity than is obſervable between the bulla ovum, ficus, terebellum, and virginea. The ſpecies ovum has the habit of a cowry, the ficus that of a murex, the terebellum that of a cone, or a buccinum, and the virginea of a turbinated helix. The bulla achatina and the bulla cylindrica likewiſe offer characteriſtic differences, which may, without any impropriety, conſtitute generical diſtinctions.

According to Linnæus, the animal of the bulla is a limax; but if it be ſuch, as Dr. Pultney obſerves, in any particular ſpecies examined by that author, it does not hold throughout the whole genus; nor even in thoſe which were primarily and eminently diſtinguiſhed by the name of bulla. In ſome ſpecies the animal appears more to reſemble an aſcidia. The animal of bulla aperta forms a new genus in Lamarck's arrangement, under the title of bullæa. The animal of bulla lignaria is furniſhed with maſticatory organs, conſiſting of three teſtaceous bodies placed within the ſtomach or gizzard, by the help of which it is enabled to break ſmall ſhells and hard ſubſtances. This inſtrument was firſt diſcovered by Plancus in the bulla aperta, in which we have ourſelves obſerved it. An account of that in the gizzard of the bulla lignaria, by Mr. G. Humphreys, is inſerted in the Linnæan Tranſactions. Theſe latter mentioned teſtaceous bodies were firſt introduced among conchologiſts as a new genus of ſhells by M. Gioëni, a Sicilian naturaliſt, after whom it was named gioenia, by Bruguière. Retzius alſo deſcribes it, but under the name of tricla. An account of the diſcovery of this important error, was publiſhed by Draparnaud, in the Bulletin des Sciences, n. 39,

Voluta. Animal a limax. Shell ſingle-celled and ſpiral; aperture without a beak, ſomewhat effuſe; pillar folded or plaited, and generally without lips or perforations.

This extenſive genus is diſperſed by Linnæus into the following principal families. * Aperture or opening entire. ** Somewhat cylindrical and emarginate. *** Obovate, effuſe, and emarginate. **** Fuſiform. ***** Ventricoſe; ſpire papillary at the tip. The whole includes one hundred and forty-two ſpecies.

Linnæus has deſervedly incurred ſome blame for having too often tranſpoſed long eſtabliſhed names from objects to which they were before aſſigned, and impoſed them on others without any apparent or ſufficient reaſon, which were never underſtood among his predeceſſors by thoſe terms. An inſtance of this kind of innovation occurs to us at preſent. The term voluta, derived "a volvendo forte revolutione ſpirali," was always applied to the cone tribe, and is very expreſſive of the peculiar roiled, or involuted ſtructure of thoſe ſhells; Linnæus deprived them of that name, called them conus, and gave the title of voluta to the ſhells of which we are about to treat. The voluta genus, furthermore, as now laid down, is highly objectionable. Linnæus, in the eſtabliſhment of this new genus, has been leſs attentive to the natural families of ſhells than could have been wiſhed, and has, by that means, brought promiſcuouſly together ſhells which ſcarcely agree in any one individual reſpect, except in having plaits or folds upon the pillar.

This error does not reſt, however, entirely with Linnæus, for he was not the original projector of the genus; he only adopted it, and gave it the name it now bears, when he might with more propriety have expunged it, or diſperſed the ſhells contained into other genera. In Liſter's work, ſection 11. lib. 4, we find a claſs of ſhells entitled, "buccina columella dentata," in which that author arranges the buccina and other ſhells which have the pillar plaited. Linnæus, by the adoption of this genus, under the title of voluta, comprehends a number of ſhells poſſeſſing very diſtinct generic characters, and which had been diſtinguiſhed by his predeceſſors under the various names of oliva, rhombus, cylindricus, turricula, mitra, muſica, and others applicable either to their figure, or to the eſſential characteriſtics of their reſpective natural families. It is a ſingular corroboration of the accuracy of the ideas entertained by thoſe writers, that the animals inhabiting the ſhells above-mentioned, have been recently aſcertained to be as diſſimilar in ſtructure as the ſhells. Linnæus conſidered the animal of all the volutes as a limax or ſlug; but from the inveſtigation of Adanſon and Argenville, and ſince the time of Müller, Poli, Lamarck, and many others, it appears that no opinion was ever more unfounded; the animal of each family being differently formed, and adapted to the peculiar ſhape or ſtructure of the ſhell.

Da Coſta, in his "Elements of Conchology," aboliſhes the Linnæan voluta genus altogether, but the ſhells are not reſtored according to his method to their proper or natural families; his definitions want preciſion, and his ſcheme is confuſed and uncouth. But notwithſtanding, the ſcheme of claſſification laid down by Da Coſta was never acceded to by conchologiſts, and certainly never will now; from the circumſtance of its being the only elementary work in the Engliſh language (Barbut's Gen. Verm. excepted) it has anſwered one uſeful purpoſe, that of directing the general collector to diſpoſe their ſhells into particular families, in a more comprehenſive manner than could have been accompliſhed by attending to the Linnæan arrangement. Thus, in the Linnæan volutæ, the families are diſtinguiſhed by the title of papal crowns, Perſian crowns, melons, olives, midas's ears, mitres, muſics, and other trivial appellations, by which they are known even to this day among Engliſh collectors. As Da Coſta derived his principal diſtinctions of theſe families from writers who flouriſhed before Linnæus, ſo alſo it has happened with the French conchologiſts: they diſapprove of the Linnæan arrangement, but retain moſt of the original families deſcribed by thoſe earlier writers, and thus we ſee at the preſent time the genera olive, turbinelle, mitre, harpe, &c. recaſt and adopted with ſome improvements, by the beſt informed conchologiſts of that country.

Buccinum. Animal a limax. Shell univalve, ſpiral, gibbous; aperture ovate, terminating in a ſhort canal, leaning to the right, with a retuſe beak, or tip; inner lip expanded.

The buccina are ſeparated into ſections, in the following order: * ampullacea, &c. inflated, rounded, thin, and ſubdiaphanous, and brittle. ** Caſſidea, caudata, &c.; tail ſhort, exſerted, and reflected; lip unarmed outwardly. *** Caſſidea, unguiculata, &c. lip aculeated on the outſide of the poſterior part, otherwiſe reſembling the laſt diviſion. **** Calloſa, &c. pillar lip dilated and thickened. ***** Detrita, &c. pillar lip appearing as if worn flat. ****** Laevigata, &c. ſmooth, not enumerated in the former diviſions.

Linnæus has occaſioned ſtrange confuſion in his claſſification of the ſhells which he denominated buccinum: in the indefinite latitude which his character of this genus admits, he embraces ſhells very little, if at all, allied to each other, in any other reſpect than according with his character. Thus the cochleæ globoſæ of Rumpſius and Argenville, the cochleæ pyriformes of Gualtieri, and other diſtinct natural families of writers, prior, as well as ſubſequent, are confounded altogether in this moſt copious genus. It is not ſufficient that theſe be kept apart by being referred to different families, they ſhould certainly conſtitute diſtinct genera.

nera. The French have long diſtinguiſhed theſe different ſhells, by the appellations on tonne, caſque, harpe, pourpre, &c.; the Engliſh collector will better conceive, perhaps, what is meant by the trivial diſtinctions of tuns, partridges, harps, and whelks. In Lamarck's arrangement, they aſſume a more claſſic form, and are defined generically, under the title of dolium, harpa, caſſis, terebra, purpura, buccinum, and naſſa, as will be more accurately explained hereafter.

Strombus. Animal a limax. Shell univalve and ſpiral; lip of the aperture often much dilated, and produced into a groove leaning to the left.

Previous to the time of Linnæus, the term ſtrombi was applied to ſhells of a different deſcription from thoſe at preſent underſtood by that name. Under the title of ſtrombi, the Greeks originally deſignated all kinds of turbinated ſhells. Among the older writers, the term ſtrombi was indiſcriminately employed as ſynonymous with turbo, trochus, and ſometimes with murex. Strombi was then a term indefinite, but rather applicable to the ſlender kinds, murices, or rhombi.

Linnæus was the firſt who limited the application of the word ſtrombus to thoſe univalve ſhells, which have the canule or gutter directed to the left, and the lip expanded. He was not, however, the firſt to eſtabliſh the genus. Liſter deſcribes the ſhells of this family which have the lip entire, under the title of purpuræ ſeu buccina bilinguia, and claſſes them in the twelfth ſection of his fourth book. Rumpfius, and after him Meuſchen, make a diſtinct genus of them, under the title of alatæ, and by this name alatus, they are pretty generally known to this day, it being well known that Solander intended to have eſtabliſhed ſuch a genus under this name. Davila ranks theſe winged alatæ among his murices, but independently, and as a diſtinct genus, conſiſting of ſimple or entire winged ſhells; placing immediately after them another genus, comprehending thoſe which have the expanded lip digitated, or elongated into pronglike proceſſes. Linnæus rejects this arrangement of Davila, including in his genus ſtrombus, the whole of thoſe winged or alated ſhells; not in a promiſcuous manner, but in ſections or families, as * Digitati, labio in lacinias lineares exeunte. ** Lobati. *** Ampliati. The French writers to this time, on the contrary, follow the example of Davila, and form two diſtinct genera of theſe ſhells under the title of ſtrombus, and pterocera, and to theſe another has been lately added after our countryman Liſter, under the name of roſtellaria.

On this arrangement, the genus ſtrombus is deſcribed as being a ventricoſe ſhell, terminated at the baſe by a ſhort canal, ſloping off or truncated: the right margin or lip dilating or expanding with age into a ſimple or entire wing-like lobe, and having a ſinus beneath, diſtinct from the ſlope of the baſe, or in the Linnæan language, the beak. This genus is ſufficiently explained by the ſhell called among Engliſh collectors the "pugiliſt's fiſt," ſtrombus pugilis of Linnæus. The genus pterocera, has the ſhell ventricoſe, terminated below by a long canal; the right margin, or lip expanding with age into a digitated wing, and having a ſinus near the baſe. The Linnæan ſtrombus lambis is of this genus. The generic character of roſtellaria is drawn from the ſtrombus fuſus of Linnæus, deſcribed by Liſter, t. 854. f. 11.; and Martini, t. 159, f. 1500. The ſhell is fuſiform, terminated beneath in a canal, ending in a ſubulated or pointed beak; right margin entire or dentated more or leſs dilated into a wing-like proceſs with age, and having a ſinus contiguous to the canal or gutter.

We may laſtly add, that the young ſhells of the ſtrombus genus do not poſſeſs the ſtriking peculiarity of the ample dilated lip before-mentioned, and that in conſequence, ſuch ſhells have been ſometimes referred to very different genera, an error committed by ſome of the beſt among the early writers.

Murex. Animal a limax. Shell inequivalve, ſpiral, rough, with membranaceous ſutures; aperture ending in an entire canal; either ſtraight, or ſomewhat aſcending.

The Linnæan genus murex is very extenſive; in the laſt edition of the Syſtema Naturæ a hundred and ſixty three ſpecies are deſcribed under the following ſections. * Spinoſi, ſpinous, with the tail (or beak) produced. ** Frondoſi, ſutures expanding into criſped foliations; tail (or beak) abbreviated (vulgarly called purpura). *** Varicoſi, ſutures rounded, protuberant, and thick. **** Ecaudati, without tail (or beak) and ſomewhat ſpinous. ***** Caudigeri, tail (or beak) ſubulate, cloſed, ſtraight and elongated; unarmed with ſpines. ****** Turriti, tapering, ſubulate, with the tail very ſhort.

The murices of the elder writers conſiſted for the moſt part of ſuch ſhells of the whelk or buccina kind as exhibited any conſiderable degree of aſperity or ruggedneſs on the exterior ſurface, the Latins having employed the word murex to expreſs the roughneſs of rude ſtones or walls. Many of the Linnæan murices are of that kind deſcribed by his predeceſſors under the name of purpuræ, the animals of which are ſpoken of by the ancients as being furniſhed with a tongue-like proceſs, by means of which they are enabled to perforate other ſhells, and derive ſubſiſtence from the incloſed animal. The Engliſh call the murices rocks, and the French in imitation, *rocher*.

Three genera of ſhells formed of the Linnæan murices by the continental writers, claim particular attention; theſe are faſciolaria, pleurotoma, and a genus, retained under the title of murex. The firſt of theſe conſiſts of ſuch ſhells as like the murex tulipa of Linnæus are of a ſomewhat fuſiform, or ſpindle ſhape; ſmooth or without rugoſities, and having upon the pillar two or three very oblique folds or plaits. Pleurotoma is alſo of a ſpindle form, with the aperture terminating below in a long gutter or canal, and has the lip cleft or cut off in a ſlope near the ſummit. The third or murex genus is of an oval or oblong form, canaliculated at the baſe, and having the outſide of the ſhell conſtantly beſet with prominent longitudinal ridges, and for the moſt part with tuberculations, ſpines, or fringes. We cannot refrain obſerving that this, and perhaps ſome further amendments in the Linnæan murices, were requiſite to reduce them to lucid order; it will not we think admit of any doubt that the two firſt genera before mentioned, ought not to be arranged in the ſame genus with the murices, admitting the Linnæan character of that genus as it ſtands in the Syſtema Naturæ. Linnæus, it is true, included ſhells of both theſe families among the murices, but ſurely without ſufficient attention to the generic character he had himſelf propoſed for the murex tribe.

Trochus. Animal a limax. Shell univalve, ſpiral, and ſubconic; aperture ſomewhat angular, or rounded; upper ſide tranſverſe and contracted; pillar placed obliquely.

The trochi Linnæus divides into three families; * umbilicati, &c.; umbilical, erect, and with the pillar perforated; as in the ſpecies niloticus and perſpectivus. ** Imperforati, &c.; erect, with the umbilicus cloſed; as in labio. *** Turriti, &c. turrited, with the pillar exſerted; ſhell falling on one ſide when placed on the baſe.

This is a long eſtabliſhed genus of ſhells, having been adopted by the principal conchological writers a conſiderable time before the Syſtema Naturæ of Linnæus appeared. Notwithſtanding this, we perceive no ſmall degree of difficulty ariſing in a general arrangement of ſhells from too ſtrict an adherence to this genus as the character is propoſed by Linnæus. We do not object to the trochus genus altogether; it is an excellent genus in itſelf, ſo far as relates to the greater number of the conic ſpecies, which may be readily diſtinguiſhed by their outline, but we cannot, it muſt be acknowledged, ſo eaſily reconcile our ideas to the propriety of including with theſe the turrited or tapering trochi of this writer; ſuch as, for example, in the ſpecies teleſcopium, and others in that family. Furthermore, it may be added that ſome amendment in the diſtribution of theſe ſhells is rendered the more neceſſary for the ſake of perſpicuity in the arrangement of a number of new ſpecies not ſtrictly according even with the former, and which have been diſcovered ſince the time of Linnæus.

Lamarck, and after him Latreille, conſtitute a new genus of the turrited kinds of the Linnæan trochi, under the title of pyramidella, and which they define generically, as being a turrited ſhell, with the opening entire, and ſemioval; pillar projecting, raiſed, with three tranſverſe folds, and perforated at the baſe. This genus is fully illuſtrated by the Linnæan trochus dolabratus.

The new genus pyramidella was certainly neceſſary; but beſides this, the continental naturaliſts above mentioned, have inſtituted ſome other genera from the Linnæan trochi, as ſolarium, and monodonta. The Linnæan trochus perſpectivus elucidates the character of the firſt of theſe three genera, which conſiſts in being of a depreſſed conic form, with an umbilical opening in the baſe, crenulated along the inner margin of the ſpiral volutions, and the opening or aperture almoſt quadrangular. This is the ſhell known among Engliſh collectors by the name of ſtaircaſe trochi, from a fancied reſemblance of the internal view of the umbilical opening to a well, or ſpiral ſtaircaſe. Theſe ſhells are comprehended by Linnæus in his firſt family of trochi; but we ſhould rather incline to admit them as a genus diſtinct from that tribe; the depreſſed contour of the ſhell, and ſingular ſtructure of the umbilical opening, forming an excellent generical diſtinction. The Linnæan trochus labio, and its analogous ſpecies, being of an oval or conoid ſhape, with the opening roundiſh and entire, but furniſhed with a projecting tooth, are the deſcription of ſhells of which the genus monodonta conſiſts.

Turbo. Animal a limax. Shell univalve, ſpiral, and ſolid; aperture contracted, orbicular, and entire.

The ſhells of this genus are divided into five families; * neritoidei, &c. having the pillar-margin of the aperture flat, or dilated and imperforate; ** ſolidi, ſolid and imperforate; *** ſolidi, &c. ſolid and umbilicated, or perforated; **** cancellati, cancellated; ***** turriti proprie dicti, turrited, or tapering.

The turbo genus, as it ſtands in the Linnæan Syſtema, is much too diffuſe, and comprehends ſhells ſo very remote from each other in various eſſential circumſtances, that the Linnæan ſtudent will find ſome difficulty in retaining it under its preſent form. So nearly indeed do the Linnæan turbines, and buccina approach, that the ableſt Linnæan is ſometimes unable to decide exactly to which of the two genera particular ſpecies ought to be referred. The diſſimilarity, in general appearance, is alſo very remarkable in the turbo genus. The conoid, and the tapering turbines of this writer, are altogether diſtinct, and ſhould certainly be aſſigned to different genera; and a diſſimilitude equally ſtriking prevails between thoſe which have a ſinus at the margin, and ſuch as have that part entire. In addition to theſe, we would mention the Linnæan turbines which have equidiſtant longitudinal ridges diſpoſed on the outſide of the ſhell, as in turbo ſcalaris and clathratus, as affording ſuch a very prominent diſtinction, that we cannot heſitate to conſider them as a genus of themſelves.

Helix. Animal a limax. Shell univalve, ſpiral, ſubdiaphanous, and brittle; aperture contracted, ſemilunar, or roundiſh.

This genus is divided into ſeveral families; as * ancipites, &c. angulated on both ſides, ** carinatæ, margin of the whorls acute, *** rotundatæ, whorls rounded, and umbilicated, **** rounded and imperforate, ***** turritæ, tapering, ****** ovatæ, &c. ovate and imperforate. The whole genus comprehends, according to the laſt edition of the Syſt. Nat. two hundred and fifty-two deſcribed ſpecies.

The animal of the helices ſeems to be endowed with a more perfect and lively power of motion than moſt others of the teſtacea tribe; this we have abundant opportunity of obſerving in the common land and garden ſnail which is of this genus. Before the time of Linnæus the helices were known under the more indefinite title of cochleæ, to which family the neritæ and ſeveral other natural families were alſo referred.

Late writers divide the Linnæan helices into a number of new genera, as janthina, bulimus, lymnæa, melania, planorbis, and helix. See Latreille, Olivier, &c.

Nerita. Animal a limax. Shell univalve, ſpiral, gibbous, flattiſh at bottom; aperture ſemi-orbicular, or ſemilunar; pillar lip tranſverſely truncated and flattiſh.

The Linnæan neritæ are divided into three families, * umbilicate, ** imperforate, with the lips toothleſs, *** imperforate, with the lips. No leſs than ſeventy-two ſpecies are deſcribed in the Syſtema Naturæ under theſe three families.

The nerita genus of Lamarck, Latreille, and other late writers, conſiſts of thoſe Linnæan ſpecies, which are ſemigloboſe, flattened at the baſe, and not umbilicated; with the opening entire and ſemi-circular; and the pillar ſomewhat tranſverſe, truncated, and often denticulated. Nerita exuvia of Linnæus is of this kind. The genus natica (natice) of thoſe writers, comprehend the umbilicated neritæ, ſuch as the ſpecies canrena, and its analogous kinds. The naticæ are ſubgloboſe, umbilicated, with the left margin callous near the umbilicus: mouth or opening of the ſhell entire; pillar oblique, and not denticulate.

Haliotis. Animal limax. Shell ear-ſhaped, dilated, ſpire lateral, and nearly concealed, and a longitudinal row of orifices along the diſk or ſurface.

Few ſpecies of this genus were known to Linnæus, and in the reference of theſe, he was peculiarly attentive to the characteriſtic longitudinal ſeries of orifices ſo conſpicuous in this genus. It was for this reaſon he referred the helix haliotoidea to the helices, rather than the haliotis tribe; the ſhell being deſtitute of this ſtriking character, though, in every other reſpect, it appertains more ſtrictly to this haliotis than the helix genus. After this we cannot think Gmelin adviſeable for having admitted the imperforate ſhells, his haliotis imperforata and perverſa, into this genus. It would have been perhaps better, even in that ſyſtem, to have conſtituted a new family for their reception; he conceived the introduction of a new genus an innovation. Chemnitz indeed calls the firſt of theſe an haliotis, but its impropriety is not leſſened by that circumſtance.

One of the imperforate kinds, the haliotis imperforata of Gmelin, was previouſly deſcribed by Heblins, under the new generic title of ſtomatia, a genus adopted ſince by Lamarck,

marck, Latreille, and various other writers; and which we cannot heſitate to admit as highly neceſſary. The diſtinctions between theſe two genera are ſufficiently characteriſtic. Stomatia has the ſhell of an oval form, and ear-ſhaped, with the ſpire prominent; the aperture ample, entire, and longer than its breadth; diſk imperforate, or without orifices. Haliotis ſhell flat, ear-ſhaped, with the ſpire very low, and almoſt lateral; aperture very ample, and longer than its breadth, and entire; and the diſk pierced with orifices diſpoſed in a line parallel with the left margin.

Liſter, in his "Hiſtoria Conchyliorum," places the haliotis, or ſea-ear tribe, among the turbinated ſhells, between the nerita and trochus; the ſame mode of arrangement is obſerved in his work "De Animalibus Angliæ," where he ſays it is ſpiral at the clavicle, in the ſame manner as other turbinated ſhells, and is therefore placed erroneouſly by ſome among the ſimple ſhells. Gualtieri ranks them among ſnails with depreſſed or flattened ſpires; Adanſon, in the firſt family of ſpiral ſhells; Da Coſta immediately after the patellæ, his firſt genus of ſimple ſhells, and Lamarck between the teſtacelle, which follows the helices and neritæ, and the vermiculaire or ſerpula.

Some writers admit it as a collateral character of the haliotis, that the inſide is always of the fineſt pearl, and pearls are oftentimes produced in theſe ſhells. The perforations vary in number in different ſpecies. It has been obſerved, that the animal always cloſes one of thoſe holes towards the ſpire, whenever he opens another towards the head as he grows bigger, and by that means that the number of openings are invariably the ſame in different individuals of the ſame ſpecies. Shells of this genus are very rarely diſcovered foſſil; we much queſtion if any of thoſe deſcribed by writers are truly of this genus.

PATELLA. Animal a limax. Shell univalve, ſub-conic, and without ſpire. Linn.

Theſe are the limpets, and are ſo named from their reſemblance to a little plate, or patella, and are more or leſs conic without, and concave within. Some have the apex or top entire; others perforated: the chambered limpets are diſtinguiſhed by a peculiar kind of projecting proceſs, or lip within; moſt have the margins entire, but ſome have an indent or fiſſure in that part; and again others are ſo completely ſpiral or wreathed in their exterior appearance that they reſemble rather the trochi, or top ſhells, than the limpet. Linnæus, in order to compriſe ſhells ſo very diſſimilar in appearance under one genus, found it neceſſary to conſtitute no leſs than five diſtinct ſections or families for their reception. Theſe he arranges in the following order.

* Labiatæ, &c. furniſhed with an internal lip; ſhell entire.

** Dentatæ, &c. with the margin angulated, and toothed.

*** Mucronatæ, &c. with the pointed tip recurved.

**** Integerrimæ, &c. very entire, and not pointed at the tip.

***** Perforatæ, &c. with the crown perforated.

Lamarck, as being one of the lateſt writers on this ſubject, deſerves particular attention; he divides the Linnæan patella into ſix diſtinct genera, which he calls patella, fiſſurella, emarginula, concholepas, crepidula, and calyptræa.

The ſhells retained under the old name of patella (patelle) are defined generically as being univalve, without ſpire, oval, or ſuborbicular, ſhield-form, or bonnet-ſhaped, concave and ſimple beneath, with the ſummit entire, and margin without fiſſure, as exemplified in patella teſtudinaria, in the fourth Linnæan family. Fiſſurella (fiſſurelle) has the ſhell ſhield-form, without any kind of ſpire, concave beneath, and at the ſummit an oval or oblong aperture. The fiſſurellæ correſpond with the fifth of the Linnæan families perforatæ, and with the genus formed by Da Coſta under the name of pierced limpets or maſks, in his "Elements of Conchology." The little ſlit limpet, patella fiſſura of Linnæus, very clearly illuſtrates the genus emarginula (emarginule), of Lamarck; the genus is diſtinguiſhed by the ſhell being of a conic form, concave beneath, and having the poſterior margin cleft. The concholepas has the ſhell univalve, oval, convex above with the ſummit obliquely inclined upon the left margin; the cavity within ſimple; and two teeth and a ſinuoſity at the baſe of the right margin. This genus is exemplified in the concholepas peruviana of Favanne, and buccinum lepas of Bruguiere. Some other writers admit it as a family of the limpets which they diſtinguiſh ſimply by having the beak produced and ſomewhat twirled or crooked. The crepidula (crépidule) of Lamarck is of an oval, or oblong form; with the ſummit inclined upon the margin, and a partial ſimple diaphragm or diviſion in the cavity. The Linnæan patella porcellana is of this genus. The calyptræa (calyptrée), is of the chambered kind, appertaining to the firſt of the Linnæan families, and is ſufficiently explained by the Linnæan patella equeſtris. The ſhells of this kind are of a conoid form with the ſummit vertical, entire, and pointed, and the cavity furniſhed with a thin plate, or tongue-like proceſs in the centre, which is either detached or connected to one ſide of the ſhell, and runs in a ſpiral direction.

DENTALIUM. Animal a terebella. Shell univalve, tubular, ſtraight, or ſlightly curved, with the cavity open at both ends, and undivided. Linn.

The ſimplicity and preciſion of the generic character of dentalium merits commendation, and, although ſome late writers on the continent ſeem too faſtidious to admit it, we deem it unexceptionable. The ſhells of this kind are known in England by the name of tooth ſhell. (Donov. Brit. Shells.) We have few ſpecies, and thoſe are principally of the minuter kinds, in this country. Gmelin enumerates altogether twenty-one ſpecies of this genus, ſome of which are found only in a foſſil ſtate.

SERPULA. Animal a terebella. Shell univalve, tubular, and adhering. Often ſeparated internally by diviſions at uncertain diſtances.

By the introduction of a few particular ſhells the Linnæan ſerpulæ are rendered altogether incongruous. The genus, as now retained, is extremely vague; and which, indeed, is neceſſary in order to compriſe the whole of the ſpecies deſcribed by Linnæus under this general head. Nothing abſolutely certain is eſtabliſhed for its character, except its being an univalve ſhell, a circumſtance common to the greater part of the ſhell tribe, and its being tubular without a regular ſpire, which is no leſs applicable to the dentalia, the teredines, and if, like Linnæus, we admit the genus to be really of the teſtaceous tribe, the ſabellæ alſo. What then remains to fix the character of a ſerpula? that it adheres to other bodies, but even this is not always the caſe; and beyond this we are again left in doubt, its character being confeſſedly indeciſive and local, "ſæpe iſthmis integris paſſim intercepta," Linn. There are ſometimes internal diviſions at uncertain diſtances in theſe ſhells, but what can we infer from theſe in conſtituting a generic character: theſe diviſions are in the firſt place concealed within the ſhells when entire, and are only to be diſcovered by deſtroying them! and can this be conſidered as a character well calculated to afford a generical criterion? Nor is this all, theſe internal diviſions are by no means conſtant; they are not as in the nautili and other regularly formed chambered ſhells placed at equal intervals, neither are they pierced by a ſiphunculus, or pipe-like receptacle communicating from chamber to chamber for the reception of the linear body of the animal inhabitant; the creature muſt remain in the ſingle chamber or encloſure, having no means of extending itſelf into the reſt of the ſhell. And beſides this, the concamerations above-mentioned do not ſeem conſtant to any particular ſpecies, but depend on the age of the ſhell, and appear to be formed progreſſively at various intervals as the animal from various cauſes or its increaſe of growth finds it neceſſary to form a larger dwelling. In this caſe the deſerted chamber laſt occupied being no longer uſeful is cloſed up, to render its new habitation more compact. We now advert only to particular ſhells; there are many ſpecies which do not exhibit ſuch a concamerated ſtructure.

One of the firſt writers upon this ſubject, after the time of Linnæus, was Da Coſta, who in his "Elements of Conchology" takes occaſion to notice the manifeſt impropriety of uniting in the ſame genus the ſhell known by the Linnæan ſtudent under the name of ſerpula penis, and the ſimple vermiculi.

He propoſes to obviate the difficulty by conſtituting two genera, the *vermiculi*, or tubular worm ſhells, which have no fixed or regular form, as the common vermiculi, (ſerpula vermicularis, Linn.); and *pencilli*, or thoſe worm-ſhells which, in the whole, or any eſpecial or particular part, have a determinate regular ſhape or ſtructure. Of this laſt genus, he obſerves there are few ſpecies; the watering pot (ſerpula pluis, Linn.) from the Eaſt Indies is the chief kind, and when perfect is much valued. The propriety of dividing theſe families of ſhells is well conceived, but the diſtinctions are leſs happily defined than might be expected. The ſuggeſtion, however, of this writer has been improved upon by the later French naturaliſts. The genus arroſoir or pencillus of Lamarck is the pencilli of Da Coſta; and yet, in truth, we ſhould add, that though the genus was laid down by Da Coſta, we may trace it to Argenville, who had previouſly, nay, even before the time of Linnæus, deſcribed the watering-pot ſhell under the title of pencillus marinus. The genus arroſoir, or pencillus, as defined by Lamarck, is a good one, and the ſame may be truly ſaid of the ſiliquaria of Davila, a genus exemplified in the Linnæan ſerpula anguina, which is diſtinguiſhed by having a longitudinal ſubarticulated opening or cleft, extending throughout the whole length of the ſhell. The concamerated ſerpulæ, we have ſeen, are not to be regarded as generically different from the reſt.

The vermiculi of Gualtieri include the Linnæan turbo ſcalaris, a rare ſpiral ſhell, better known in England by the name of wentletrap, and which is eſteemed of conſiderable value on account of its rarity. This writer places it with the vermiculi, becauſe, as he obſerves, the ſpires of the ſhell are not produced from or ſupported by a pillar, as is conſtantly the caſe in turbinated ſhells, but poſſeſs, on the contrary, the true character of the ſpiral worm ſhells; and there is certainly much truth in the ideas of Gualtieri, though we do not at the ſame time perceive the abſolute neceſſity of removing it to this genus, and we ſhould anxiouſly and moſt ſcrupulouſly avoid any needleſs innovation. Laſtly, we ſhall mention that the author of the "Teſtacea Britannica" propoſes as an amendment in the ſerpulæ, to divide them into two diſtinct genera; the ſerpula he retains under the old Linnæan character, "ſhell univalve, tubular, adhering, or affixed to other bodies; in ſome ſpecies divided into cells." The other he calls *vermiculum*, and defines "ſhell univalve, ſhape various; not attached, or adhering to other bodies." This we believe muſt in candour be admitted as more vague and indefinite than even the Linnæan diſtinction, and by the laxity of expreſſion may as well apply to the whole tribe of univalve ſhells, the adherent ſerpulæ excepted, as to the particular family called vermiculum. But though we diſapprove of the character aſſigned, we perfectly agree with the ingenious author as to the propriety of ſeparating the adhering kinds of ſerpula from thoſe ſpecies which conſtantly occur detached.

TEREDO. Animal a terebella, furniſhed with two calcareous, hemiſpherical valves, or maxillæ, truncated before, and two others of a lanceolate form; ſhell tapering, flexuous, and penetrating wood.

The animal inhabiting this ſhell is a terebella of a particular kind; the body being of a ſoft and gelatinous nature, but having the head provided with an inſtrument of a calcareous ſubſtance, which performs the office of an augre, and enables the worm to penetrate the hardeſt oak. The moſt deſtructive of the animals of this genus is the teredo navalis, which penetrates the bottoms of ſhips. It was originally imported from India into Europe about ſeventy years ago. Sellius, in the year 1733, publiſhed a treatiſe on this ſubject under the title of "Hiſtoria Naturalis Teredinis, ſeu Xylophagi marini Tubulo-conchoidis." It was afterwards deſcribed and figured by ſeveral writers, and among others by Baſter, in the Philoſophical Tranſactions, vol. lxi. It is now too well known by the name of *ſhip-worm*. See Donov. Brit. Shells.

Three ſpecies only of this ſingular genus have been yet diſcovered, and which are named navalis, utriculus, and clava. Favanne and Guettard divide theſe ſhells into two genera, teredo (taret) and fiſtulana; the ſhell of teredo is diſtinguiſhed as being tubular, cylindrical, and open at both ends, lower orifice furniſhed with two lozenge-ſhaped valves, and the upper with two ſpatulous opercules. Fiſtulana is a genus compoſed of a ſingle ſpecies, teredo clava, Gmel.: the ſhell is tubular, clavated at one end, open at the ſlender extremity, and containing in the cavity two non-adherent valves. This laſt is called by Favanne, fiſtulana cornicula, and fiſtulana gregata by Guettard.

SABELLA. Animal a nereis, with ringent mouth, and two thicker tentacula behind the head: ſhell tubular, compoſed of particles of ſand, broken ſhells, and vegetable ſubſtances, united to a membrane by a glutinous cement.

The ſabella, according to Linnæus, is inhabited by an animal of the nereis kind. Some of theſe animals were known among the old writers under the name of ſea ſcolopendiæ. Since the time of Linnæus, the number of ſpecies has been greatly augmented by the diſcoveries of Pallas, Fabricius, Müller, and others, and the nature of thoſe animals become better underſtood; in conſequence of which, they have been diſcovered to be the habitations not only of the nereis, but likewiſe of the amphitrite and terebella genera. We ſpeak of the marine kinds: with reſpect to ſeveral of the ſuppoſed ſpecies of ſabella found in freſh water, it is accurately determined they are not of this race of animals, but the larvæ of ephemeræ, phryganeæ, and other inſects, which conſtruct cylindrical cells of extraneous matter, in which they reſide while they remain in that ſtate in the water. Some naturaliſts, in order to avoid confounding theſe larvæ with the true ſabella, have cautiouſly omitted the whole; and we indeed ſuſpect, that although they may continue to be retained by the Linnæan ſtudent among the ſhell tribe, they will be expunged, or many of the ſpecies at leaſt, by future ſyſtematiſts. The Gmelinian ſyſtem comprehends 25 ſpecies of ſabella, the freſh-water kinds, deſcribed by Schroetter, included.

The marine ſabellæ ſhells are compoſed chiefly of ſand and the fragments of ſhells; thoſe of the ſuppoſed ſabella found in freſh water, either of ſmall fragments of vegetables, or the broken ſhells of teſtaceous vermes, thoſe of the helix tribe eſpecially.

Having preſented the reader with a detailed view of the Linnæan ſyſtem of conchology, we ſhall next proceed as before to ſpeak of the other principal writers on the ſubject, as nearly in chronological order as circumſtances will permit.

The third volume of the extenſive and coſtly work of Seba "Deſcriptio Theſauri Rerum Naturalium," was produced at Amſterdam in 1758. This part treats on marine ſubjects generally, as cruſtaceous and teſtaceous animals, corals, &c.; and contains, beſides plates in other departments, ſixty-one elucidatory of conchology. As a book of reference to the more ſtriking and well-known kinds of ſhells, the work of Seba poſſeſſes merit: it has been obſerved, and with much truth, that this valuable publication might however have been rendered leſs expenſive by the omiſſion of a number of figures, which conſiſt merely of repetitions, and alſo the ſpecimens of art abſurdly introduced, ſuch as the fanciful decorations on the ſhells of the nautili, and the examples of "ſhell work," on which a profuſion of engraving is unneceſſarily expended.

In the "Hiſtory of Cornwall," Dr. Borlaſe preſents us with a plate of ſhells containing about thirty ſpecies; the deſcriptive matter is ſlight, and is principally copied from ſome of the oldeſt writers on the ſubject. This was publiſhed in folio in London, A.D. 1758.

The magnificent work of Francois Michael Regenfus, "Choix de coquillages et de cruſtacés," appeared at Copenhagen, under the patronage of the king of Denmark, in the ſame year as the preceding. The work compriſes twelve coloured plates in imperial folio, and each plate comprehends twelve ſhells. The deſcriptions, which are written both in the French and Daniſh language, are the joint labour of profeſſor Kratzenſtein and Dr. Aſcanius. It has been lamented that the talents of this artiſt were not employed on ſubjects better deſerving of elucidation, as thoſe which are figured by Regenfus fall daily under the notice of the moſt humble collectors. A ſecond volume was begun, and conſiderable progreſs made in it before the year 1776; but as the artiſt is no more, the undertaking is in all probability relinquiſhed. Twelve plates deſigned for the ſecond volume are poſſeſſed by ſir Joſeph Banks, and which include ſhells of greater rarity than thoſe inſerted in the firſt volume.

We have already adverted to the "Claſſes Conchyliorum" of Carolo Auguſto de Bergen, publiſhed at Nuremberg in 1760. This little treatiſe contains a compendious view of the principal ſyſtems of conchology which had then appeared, under the heads of "Methodi Univerſales," and "Methodi Particulares," with conciſe prefatory ſtrictures on each. Theſe remarks of Bergen have evidently furniſhed later writers with many uſeful criticiſms on the ſeveral works that fall within the compaſs of his view, and may, upon the whole, be thought far preferable to many more elaborate obſervations that have ſince appeared on the ſame ſubject.

The "Amuſement Microſcopique" of Ledermuller relates to minute ſhells, and contains many figures. The firſt part was publiſhed at Nuremberg in 1764, and in 1766 and 1768 two other parts of the ſame work.

Davila's "Catalogue Syſtematique et Raiſonné des Curioſités de ſon Cabinet" was printed at Paris, in 1767, in three volumes octavo, preparatory to the diſperſion of his collection in the following year. The firſt volume treats entirely of ſhells, and contains twenty-two plates of the rarer ſpecimens in his cabinet, many of which are ſcarce even at this day. This work affords much intereſting information, though it is to be conſidered only as a ſale catalogue. The ſame year a ſimilar production, "Catalogue Syſtematique des Coquillages de Arnold Leers, de Rotterdam," appeared at Amſterdam, as an annunciation of the ſale of his valuable collection. This was written by Mr. F. C. Meuſchen, German envoy at the Hague, and contains a ſheet ſyſtem of ſhells.

The work of Geoffroy, "Traité des Coquilles, tant fluviatiles que Terreſtres, que ſe trouvent au Environs de Paris," was printed in 1767, and forms a valuable acquiſition in this department of ſcience. Three plates engraven by Ducheſne, contain figures of forty-ſix ſhells deſcribed by Geoffroy.

A curious and intereſting paper by Heriſſant, occurs in the Mem. de l'Acad. des Sciences, for 1768, entitled, "Eclairciſſemens ſur l'Organization juſqu' ici inconnue d'une Quantité conſidérable de Productions Animales, principalement de Coquilles des Animaux," with eight illuſtrative plates, three of which relate to ſhells. In the ſame year the "Memoire ſur le Coquillage appelé Datte en Provence" of A. D. Fourgeroux de Bondaroy, was inſerted in Mem. Etrang. de l'Acad. Roy. de Sc. together with a plate elucidatory of the ſubject, which is the Linnæan mytilus lithophagus.

Cotte's obſervations on the phyſiology, &c. of the ſnail tribe, occur in the "Journal de Sçavans" for 1770, and in the "Journal de Phyſique les Délices des Yeux, et de l'Eſprit" of Knorr, completed in 1773, conſiſt of ſix parts, and altogether contain 978 figures of ſhells. The author was a painter at Nuremberg, and his publication commenced in 1760; but not living to finiſh the undertaking, the laſt part was brought forward by his executors. Knorr had collected materials for another teſtaceological work, his "Deliciæ Naturæ ſelectæ," which was afterwards prepared for public view under the direction of Müller and De la Blaquière.

Another conchological work, of ſtill greater extent, "Neues ſyſtematiſches Conchylien-cabinet," was in a progreſſive courſe of publication at Nuremberg, about the ſame period. The firſt part appeared in 1769, another in 1771, and a third in 1777. Theſe conſtitute the firſt three volumes, which were all its author, Martini, lived to complete. Seven volumes have been ſince added by F. H. Chemnitz. The body of the work is written in the German language; the embelliſhments conſiſt of 366 plates, and exhibit a number of figures on each plate. It is highly probable this work will never be extended beyond its preſent limits; Chemnitz being dead, and his collection of ſhells, which was very copious, having been diſperſed within the laſt four years by public ſale. The catalogue of ſale bears date Feb. 7, 1803, it was drawn up by H. S. Holten, in a ſmall duodecimo, entitled, "Enumeratio ſyſtematica Conchyliorum J. H. Chemnitzii," &c.

Schröter is the author of many treatiſes on the ſubject of ſhells, and which appear to be little known. He has in particular diſtinguiſhed himſelf by his obſervations on the river ſhells of Thuringia; the ſource from whence Gmelin has obtained many of the new-ſpecies deſcribed in his edition of the Syſtema; the ſabellæ of this writer are very numerous. See his "Die geſchichte der Fluſſconchylien, mit vorzüglicher rückſichte auf diejenigen welche in den Thüringiſchin giſchen waſſern leben," 1779. This was preceded by a ſmall publication on the land ſhells found chiefly in the neighbourhood of Thangelſtadt, "Verſuch einer ſyſtematiſchen abhandlung uber die Erdkonchylien um Thangelſtadt." A later production of this writer's is the "Einleitung in die Conchylien kenntniſs nach Linné," publiſhed in three volumes octavo, 1783—1786, and which to the German ſcholar forms a valuable introduction to the ſtudy of conchology.

The "Zoologiæ fundamenta" of Martinus Thrane Brunnich, was publiſhed in 1772, and relates in a partial degree to ſhells.

In the "Vermium terreſtrium et fluviatilium Hiſtoria" of Müller, we are preſented with an arrangement of land and river teſtaceous animals diſpoſed according to the characters of the animals themſelves inſtead of their ſhells. The firſt volume was begun in 1773, and the ſecond in the year following. The teſtaceological productions of Denmark are deſcribed in the "Zoologia Danica" of this author.

The "Viaggia in Dalmazia," or travels in Dalmatia, by Albert Fortis publiſhed at Venice in 1774, contains a few figures elucidatory of thoſe ſhells which he found in the Porto di Bua.

The "Elements of Conchology," by Da Coſta, was publiſhed in 1776. This work preſents us with a new arrangement of ſhells, and beſides contains ſome judicious obſervations on the claſſification of Linnæus, and ſome other writers; which latter, in our opinion, deſerve more attention than his ſyſtem of ſhells. The "Elements" of this writer is one of the moſt inferior of this author's works. His "Britiſh Conchology," publiſhed in 1778, is more valuable, though it does not take a ſufficiently extenſive view of the Britiſh teſtacea. Da Coſta had intended to publiſh a ſecond edition of theſe with conſiderable improvements; the collection of materials, and the MS. for which are in the poſſeſſion of Mr. Donovan, and have been in part incorporated into his "Natural Hiſtory of Britiſh Shells." The great forte of Da Coſta appears to be in the antediluvian race of ſhells, and other extraneous foſſils, and in the more uſeful departments of mineralogy, or what he denominated native foſſils. Upon theſe ſubjects alone, no leſs than ten folio volumes of unpubliſhed manuſcripts are preſerved at this time in the extenſive collectanea of original MS., &c. formed by Mr. Donovan, and which are intended to be placed in the library of his muſeum.

Among the few teſtaceological works noticed by Da Coſta, in the introduction to his "Elements," he ſpeaks of "a new and anonymous conchology, began to be publiſhed in this metropolis, in 1770, in folio, illuſtrated with copper plates." "It was intended (he obſerves) to be a general natural hiſtory of ſhells, and to include figures of all the known ſpecies, common as well as rare, beautiful or otherwiſe, and ſome copies were deſigned to be accurately coloured for the uſe of the curious. This anonymous production was, to our knowledge, written by Da Coſta, and was the joint undertaking of himſelf and Mr. George Humphrey, by the latter of whom moſt of the ſhells were furniſhed that are deſcribed in this work. The numbers of this work that were publiſhed comprehend the firſt three families of his ſyſtem, limpet, ſea-ear, and ſerpula.

The publication of Ignaz Edler von Born, the celebrated mineralogiſt entitled "Index Rerum Naturalium Muſaei Cæſarei Vindobonenſis" preſented the public in 1778 with the deſcription of the ſhells preſerved in the muſeum of the empreſs queen at Vienna; and was undertaken at the expreſs command of her imperial majeſty. Two years after the baron publiſhed his "Teſtacea Muſei Caeſarei Vindobonenſis," as a ſplendid illuſtration of his former work; this contains about two hundred coloured figures delineated in eighteen folio engravings.

The early editions of the "Britiſh Zoology," as it is entitled by Mr. Pennant, though in reality it embraces only an inconſiderable portion of the zoological productions of Britain, include none of the teſtaceous tribe: theſe were added, in a fourth volume publiſhed in 1778. This volume contains an enumeration of 163 ſpecies of ſhells with conciſe deſcriptions, and 56 plates exhibiting figures of nearly all that are deſcribed. Dr. Maton obſerves in his comments on this work that "moſt of the plates are valuable for reference, but ſome of them are executed leſs carefully than could have been wiſhed. In the deſcriptive part (ſays the doctor) the author has tranſlated pretty cloſely the ſpecific characters, given by Linnæus, whenever they could be had, but there are ſeveral ſpecies of which the former is to be looked upon as the firſt deſcriber. It is very remarkable, however, that he ſhould have wholly omitted others which had been noticed by Liſter and Petiver, and which are unqueſtionably natives of our iſland." The number of Britiſh ſpecies of teſtacea known to us at preſent amount altogether to ſeveral hundreds more than Mr. Pennant was acquainted with, and it is our knowledge of theſe which renders his catalogue of little moment. But we ought in candour to allow that conſidering the very low ebb of natural ſcience in this country at the period Mr. Pennant wrote, his work is a reſpectable performance: we mean with regard to the number of ſpecies contained. The deſcriptive matter certainly betrays great want of information, as well as ſcience: many of the ſynonyms are miſapplied, and the names erroneous.

The "Obſervations ſur les moules" in the "Journal de Phyſique," 1779, is from the pen of a lady, Maſoon le Golſt, and relates to the reproduction of parts of muſcles. Dicquemare treats upon the locomotive faculty of oyſters in the ſame volume of this journal "Sur la Faculté locomotive des huitres," p. 241. tom. 28.

In 1780 the "Fauna Groenlandica," of Otho Fabricius was printed at Leipſic. This work contains the deſcription of fifty ſeven ſpecies of ſhells found in Greenland, among which are a number not previouſly obſerved by writers. Fabricius pays conſiderable attention to the ſtructure and habits of the animal as well as the ſhell.

The "Zoophylacium Gronovianum," a deſcription of the rich muſeum of L. T. Gronovius ſenator at Leyden was publiſhed in 1781. There are in this work a ſcientific deſcription of 589 ſpecies of ſhells, and among the plates, two appropriated to the illuſtration of the rarer kinds.

Molina's "Saggio ſulla ſtoria naturale del Chili," or natural hiſtory of Chili, comprehends deſcriptions of the ſhells obſerved by this writer in that part of South America. The work was printed in octavo, at Bologna in 1782.

A ſmall octavo tract was publiſhed at Naples in 1784 entitled "Deſcrizione di una nuova famiglia, e di un nuovo genere di Teſtacei, trovati nel littorale di Catania, con qualche oſſervazione ſopra una ſpezie di oſtriche," by M. Gioeni. The ſuppoſed new genus of ſhells which occurred to the notice of Gioeni on the ſhores of Catania was no other than the hard teſtaceous ſubſtance found in the gizzard of bulla lignaria, a ſimilar organ to which we have ourſelves found in the gizzard of bulla aperta. Some years paſſed before this miſconception was detected: it had been really conſidered as a ſhell by profeſſor Retzius from whom it obtained the name of triola Gioenii; and it is arranged alſo in the ſyſtem of Bruguiere under the name of gioenia ſicula. M. Draparnaud claims the merit of having firſt aſcertained the real nature of this teſtaceous ſubſtance, an account of which he inſerted in the Nouv. Journ. de Phyſique. We ſhould add that the ſame article is deſcribed and illuſtrated with figures in the ſecond volume of the Linnæan Society by Mr. G. Humphrey, aſſociate.

A variety of new and very curious experiments by the indefatigable Spallanzani on the reproduction of the head of the common ſnail is recorded in two memoirs, the firſt of which was publiſhed in 1782, the other in 1784. See "Riſultati di Eſperienze ſopra la Reproduzione della Teſta nelle Lumache Terreſtri," Mem. della Soc. Ital. t. 1. p. 581.—t. 2. p. 506

The ſplendid work on ſhells by Martyn entitled the "Univerſal Conchologiſt," was begun in the year 1784, and continued to be publiſhed at uncertain intervals till 160 plates appeared, when its progreſs was finally impeded. This work commenced with the nondeſcript ſhells collected in the different voyages of the Engliſh circumnavigators in the South Seas; many of which are ſtill eſteemed valuable, while others, as may be imagined from our more habitual intercourſe at this time with the ſouthern hemiſphere, are become common. As a ſcientific work, this performance will be found altogether defective, and it is beſides too barren of general particulars, to render the ſubject pleaſing to the common reader. Much greater praiſe is due to the plates, which are the productions of Grozier, and many other artiſts, and are for the moſt part well executed; it may be indeed added that they are the repreſentations of objects in themſelves ſo beautiful as to afford the artiſt every facility in the diſplay of talent. A number of the original ſpecimens are in the cabinets of Mr. Wood, apothecary, Mrs. Forſter, and others in London.

A ſmall quarto treatiſe embelliſhed with three plates, the joint labour of Mr. W. Boys, and Mr. G. Walker, appeared in London in 1784. The work treats only of microſcopic ſhells, and the reſearches of its authors were confined to the ſandy ſhores of Sandwich as the title indicates "Teſtacea minuta rariora nuperrime detecta in arena littoris Sandvicenſis." It is dedicated to the late ducheſs of Portland.

In the Philoſophical Tranſactions for 1786 is "an account of ſome minute ſhells, either not duly obſerved, or totally unnoticed by authors." This is illuſtrated with three plates and is the production of the rev. Mr. Lightfoot, the learned author of the "Flora Scotica," to whom the world is ſo highly indebted for his indefatigable inquiries reſpecting the Britiſh fuci and confervæ.

In 1786, C. L. Kämmerer deſcribed the collection of the hereditary prince of Schwarzburg-Rudolſtadt. This catalogue is in the German language, and is embelliſhed with twelve plates; it bears the title of "Die Conchylien in Cabinette der Herrn. Erb.—Prinzen von Schwartzburg-Rudolſtadt. An appendix, with four additional plates, was publiſhed at Leipſic in 1791, under the title of "Nachtrag zu der Conchylien un Fürſtlichen Cabinette zu Rudolſtadt."

The "Journal de Phyſique" for 1787, contains a deſcription accompanied with figures of chiton ſquamoſus by Lefebure des Hayes.

In the Tranſactions of the Ruſſian Academy, for the year 1787, we find a memoir on teſtaceology, entitled "Marina varia, nova, et rariora," by profeſſor Pallas. The ſubjects treated of are ſerpula ſpirillum, lepas carioſa, pholas teredula, chiton amiculatus, and helix coriacea. This author had previouſly diſtinguiſhed himſelf by his critical writings on conchology, both in his "Spicilegia Zoologica," which appeared in 1780, and his "Miſcellanea Zoologica," publiſhed ſome years before.

Retzius in the ſame year printed his "Nova Teſtaceorum Genera,", a ſmall work in quarto, in which many alterations and improvements on the Linnæan ſyſtem of conchology are projected. It was previouſly the ſubject of an inaugural diſſertation at Lund. Retzius was likewiſe the author of a deſcription of Venus lithophoga, publiſhed in the Memoirs of the French Academy for 1786.

Cordiner's work of "Remarkable Ruins and Romantic Proſpects of North Britain," appeared in numbers, and beſides the views compriſes ſome plates of natural hiſtory, among which are a few of the more remarkable ſpecies found on the coaſt of Scotland, grouped with a variety of other marine productions. Antiquity is however the leading feature of this work. Only part of this production appeared in 1788; ſome additions have been made to it ſince that time.

In the year 1789, Bruguiere, the well known traveller in the eaſt, commenced the teſtaceological part of the grand work, carried on in France, under the title of "Encyclopédie Méthodique," but unfortunately for the cauſe of ſcience, this ſkilful naturaliſt lived only to complete the firſt volume, which does not go beyond the letter C. of the article *vers* (worms). The prefatory matter to this volume contains the method of an arrangement he intended to purſue, founded principally upon that of Linnæus, with ſuch additions and deviations only, as he conceived to be required by the diſcoveries of other naturaliſts ſince the publication of the Linnæan Syſtema. This is the principal, though not the only production on the ſubject of conchology, Bruguiere ſubmitted to the world.

A pleaſing variety of beautiful and curious ſpecies of teſtaceous tribes, chiefly the extra-European kinds, have been introduced, at various times, to the notice of the Engliſh reader, through the medium of that well known periodical undertaking the "Naturaliſt's Miſcellany," of Dr. Shaw. We are not a little ſurpriſed indeed to obſerve, that the greater number of univalve ſhells in this work are reverſed in the plates, and are therefore likely to miſlead the incautious obſerver into a perſuaſion, that they are in reality heteroſtrophous. This work commenced in 1790, and ſtill continues in a progreſſive courſe of publication.

The "Zoologia Adriatica," of Abbé Olivi, printed in 1791, contains an account of the ſhells found in the gulf of Venice, with a ſeries of engravings, to illuſtrate ſome of the more remarkable ſpecies. In the "Ann. de Chimie," for the ſame year, M. Vauquelin treats of the reſpiratory proceſs in the helix pomatia, and proves in the courſe of his obſervations, that the vermes require vital air for the excitement of their pulmonary ſyſtem as well as other animals. The ſpecies above mentioned (according to this author) will reſpire azotic and carbonic acid gas, as long as any oxygen remains combined with either. The "Obſervations ſur la génération des Buccins d'Eau douce," by M. Ribaucourt, inſerted in the "Journ. d'Hiſt. Nat." for the ſame year, tend to prove that all the ſpecies of that tribe are viviparous. The laſt we have to mention in this year are the papers of M. Cuvier, the celebrated comparative anatomiſt. Theſe relate to the anatomy of the animal of the Linnæan patella vulgaris, and unguis; and the bulla aperta, and are to be found in the "Annales du Muſeum National."

The firſt volume of "Teſtaceographia ac Zoophytographia parva et microſcopica," by Am. Soldani, is dated 1789; a ſecond volume appeared in 1795. The microſcopic ſubjects, deſcribed by this writer, are principally ſhells diſcovered by himſelf at Porto-Ferrara; the iſland del Giglio; on the ſhores of Caſtiglioncello, la Follonica, &c. No leſs than 148 plates embelliſh this work, in which the ſhells are repreſented both of their natural ſize and magnified.

A number of minute, or microſcopic ſhells, diſcovered by the late Mr. Adams, on the coaſt of Pembroke, are deſcribed by that ingenious collector in the third and fifth volume of the Tranſactions of the Linnæan Society, in which will be alſo found two plates, containing figures of the ſhells deſcribed.

Among the “Obſervations ſur les Coquilles,” inſerted in the “Journ. d'Hiſt. Nat.” for 1792, and in the “Prodrome d'une nouvelle Claſſification des Coquilles.” Mem. Soc. d'Hiſt. Nat. An. 7, the curious reader will find much intereſting matter relative to the teſtaceological ſyſtems of Linnæus, and Bruguiere, and alſo a ſketch of that propoſed by their author, M. Lamarck. Theſe were the prelude to his more important undertaking “Syſtême des Animaux ſans Vertebres,” in which we meet with a new arrangement of teſtaceology more comprehenſive and ſatisfactory than has perhaps hitherto appeared upon this intereſting ſubject.

The “Teſtacea Microſcopica aliaque minuta ex Generibus Argonauta et Nautilus ad Naturam picta et deſcripta,” publiſhed at Vienna in 1798, is the joint production of L. A. Fichtell and J. P. C. Moll. It treats principally on the minute ſhells of the argonauta and nautilus genera, and contains, beſides the deſcriptions in the Latin and German languages, accurate figures of a great number of ſpecies, among which are many that eſcaped the obſervations of Plancus, and every other writer.

Mr. Hutchinſon's new and enlarged edition of the “Hiſtory of Dorſetſhire,” includes a catalogue of the birds, ſhells, and more rare plants of that county, by Dr. Pultney. The teſtaceological part of this catalogue is that which intereſts us in the preſent detail. Dr. Pultney beſtowed conſiderable attention on this department; his remarks on the Linnæan genera, which the limits of his views permitted him to notice, are judicious; the ſpecies he deſcribes are, however, leſs numerous than might be expected, nor can we refrain adding, with due reſpect to the memory of that zealous and well informed naturaliſt, that all the ſhells deſcribed as ſpecies, are not defined in a clear and ſatisfactory manner. As a local catalogue we admit its general utility with this exception.

The above mentioned catalogue was printed in 1799, and in the Philoſophical Tranſactions for the ſame year, appeared Mr. Hatchet's “Experiments on Shell and Bone,” in which that accurate chemiſt relates the particulars of his diſcoveries reſulting from analyſis of the component parts of teſtaceous and cruſtaceous ſubſtances, in the firſt of which he detected the preſence of phoſphate of lime, and he found the other to conſiſt only of the carbonate of lime mixed with gelatinous matter. The publication of Donovan's “Natural Hiſtory of Britiſh Shells,” commenced early in 1799. This work was deſigned to include all the ſpecies hitherto diſcovered in Great Britain, ſyſtematically arranged in the Linnæan manner, with ſcientific and general obſervations on each. Five volumes have ſince appeared in a progreſſive courſe of publication, compriſing altogether 180 plates, with many coloured figures. The writer of this article does not feel at liberty to comment further on a work which he has himſelf ſubmitted with deference to public opinion. It is allowed by Dr. Maton and Mr. Rackett, in their review of teſtaceological writers, inſerted in the Linnæan Tranſactions, “that the author has given ſeveral new ſpecies, and that he has rectified many errors of preceding writers.”

The fifth or laſt volume of Mr. Dryander's “Bibliotheca Hiſt. Natur. Bankſiana,” was publiſhed in 1803. This is an account of the books on the ſubject of natural hiſtory, in the valuable library of Sir Joſeph Banks bart., and although only a catalogue, will be found to contain much general information. In the “Elenchus Sectionum,” we are preſented with a methodical arrangement of the principal teſtaceological ſubjects treated of by different writers, named in the other part of the catalogue; and which, in many reſpects, may prove more acceptable as a mode of reference than a catalogue conſiſting merely of the titles of the books and names of the authors.

A paper deſcribing the hinges of ſome Britiſh ſhells of the bivalve tribe, by Mr. W. Wood, is inſerted in the ſixth volume of the Linnæan Tranſactions. The attempt is ingenious, but on a very confined ſcale, and it preſuppoſes, without the ſlighteſt countenance of fact, that among the many writers who had previouſly noticed ſhells, or even written profeſſedly on them, no one had hitherto paid attention to their hinges. The paper is illuſtrated by ſix plates of outlines.

In 1803, the “Teſtacea Britannica” of Mr. G. Montagu, was publiſhed in two quarto volumes. The number of ſhells deſcribed in this work is conſiderable, as it comprehends an account of the microſcopic kinds, in addition to thoſe of a larger ſize. It is embelliſhed with ſixteen coloured plates.

“The Hiſtorical Account of Teſtaceological Writers,” to which, in the courſe of our foregoing obſervations, we have had frequent occaſion to advert, appeared in the ſixth volume of the Linnæan Tranſactions, publiſhed in 1804, and is the joint production of Dr. W. G. Maton, and the Rev. Thomas Rackett.

The “Tableau Methodique des Molluſques,” by Latreille, publiſhed in the twenty-fourth volume of the “Nouveau Dictionaire d'Hiſtoire Naturelle,” printed at Paris in 1804, affords us an arrangement of ſhells, founded on that of Lamarck, with ſome additions that may render it more applicable to general uſe.

The riſe, progreſs, and general traits of the hiſtory of this ſcience may be more readily collected, we apprehend, in the courſe of the foregoing review of the different works that have appeared on the ſubject, than from any other mode that might be deviſed; and, under this idea, we have adhered as nearly as poſſible to the chronological order of arrangement, this being the moſt likely to facilitate the purpoſe intended. From the peruſal of this, the reader will at once perceive which are the moſt conſiderable and valuable works on the ſubject, as well as obtain a general knowledge of a number of treatiſes, tracts, and memoirs, on particular articles connected with teſtaceology, which, being diſperſed through a variety of miſcellaneous and voluminous publications, might, without ſuch reference, eſcape attention. The leading features, or deſign, of the reſpective performances, are likewiſe detailed, and the embelliſhments which accompany them pointed out; and, in fact, every other particular deemed likely to aſſiſt the ſtudent in his choice of the beſt books in forming a teſtaceological library.

In reſuming this ſubject, as we propoſe under the article TESTACEOLOGY, we ſhall be prepared to offer ſome further, and more general remarks on this topic, and in particular to ſubmit our own ideas as to an enlarged and improved arrangement for the claſſification of teſtaceous bodies, founded on the leading principles of the beſt authors, with ſuch amendments as we conceive neceſſary. D.

Miſcellaneous Additions relative to Conchology.

The following inſtructions for collecting, cleaning, and preparing ſhells, may not be unacceptable.

The teſtaceous, like all other animals, have their particular reſorts; ſome inhabit only the deep parts of the ſea, and are what the old writers diſtinguiſhed by the name of pelagian ſhells; others are as conſtantly found in ſhallow water, in bays, or thoſe parts of the ſea which are contiguous to the entrance of rivers: it has alſo been obſerved, that many fine and rare ſhells are ſometimes found in the ſtraits between iſlands, and in ſhallows near the coaſt, of four or five fathom water. Some ſpecies alſo are found on rocky, and others on ſandy ſhores. The beſt ſhells are thoſe taken alive out of the ſea, from whence they may be obtained by means of a trawling-net, ſuch as the fiſhermen employ, if the depths are not too great; they are alſo brought up by the cable in weighing anchor, the log-line in ſounding, and various other means. Sometimes valuable marine ſhells are found ſticking to the bottoms of ſhips, or the ſides of rocks.

After a ſtorm, good ſhells may be picked up on the ſea beach or ſhore, as the violent agitation of the water in a tempeſt ſeparates them from their native beds, and often caſts them aſhore. But ſuch as have lain expoſed for ſome time to the heat of the ſun, or beaten by the waves, are of little value, as their colours will be found faded, and the ſhells worn and broken; thoſe only are worth ſelecting from the ſea-ſhore, which have the animal alive within, or which have been recently thrown up.

River ſhells are, in general, of an obſcure colour, and remarkably thin and brittle, inſomuch that ſome have imagined it a peculiar character, by means of which they may be diſtinguiſhed from the marine or terreſtrial kinds. This is not, however, an abſolute criterion, for many of the latter are as thin as the river ſhells, as we obſerve, for example, in the argonautæ, or paper nautili, ſome pinnæ, and many other ſea ſhells, and in numbers of the ſhells of the terreſtrial kind.

Terreſtrial, or land ſhells, though few in compariſon with the former, are oftentimes very beautiful, and not leſs eſteemed than the marine kinds. Thoſe are found moſt commonly crawling, like the ſnail tribe, on various ſorts of plants, and in warm countries eſpecially abound.

Many ſhells poſſeſs ſuch a ſmooth, and highly poliſhed ſurface, and are ſo beautiful in colour when they are fiſhed up, that art cannot improve their appearance, ſuch as for inſtance, the cypræa or cowry, and the voluta or volute, with many others. It is the commonly received opinion, that the animals, inhabiting all naturally poliſhed ſhells whatever, are capable of not only adding to the extent and growth of their ſhells, but that they are able, from time to time, as occaſion may require, to add a freſh poliſhed covering to the whole ſhell. Should this opinion be unfounded, they can at leaſt extend their organs to ſuch a length, as to clear away all impurities from their ſhells, as we ſeldom find any cowries with coral, or any extraneous bodies, adhering to any part of them.

Other ſhells are covered with an epidermis or membrane, intended no doubt by nature to defend them from accident, and aid their growth. The ſtructure of this epidermis varies very much, being in ſome laminated, in others fibrous or bruſh like, or pilous, and velvetty. The epidermis prevents the lepas, and other ſimilar ſhells, or marine worms, from fixing their habitations on them; it is worthy of remark, that moſt ſhells, with a ſcabrous ſurface, are covered with an epidermis. Many others, when taken out of the ſea, are ſlimy, and encruſted with filth, coralline, and other extraneous matter.

Immediately after gathering or collecting the ſhells, and thoſe eſpecially taken from the ſea, the firſt proceſs neceſſary, is to deſtroy and extract the animal inhabitant, without injuring the ſhell, and then to prepare the ſhell that it may not be damaged by the action of the marine ſalts, with which they are ſaturated. As ſhells are of a calcareous nature, all acids ſhould be as much avoided as poſſible, both in killing the animal, and preparing the ſhell; it is uſual to boil them in water for this purpoſe, but as boiling may injure the ſhells, it will be moſt adviſeable to dip them into ſcalding water, which will be ſufficient to kill the animal, after which, let them remain for two or three minutes to cool, and then put them into cold water, in which they may lie till they are taken out to be cleaned. The animal, by being killed in this manner, becomes condenſed, and ſomewhat ſolid, and may be picked out by any ſharp inſtrument.

Shells encruſted with extraneous matter ſhould be allowed to ſteep for ſome time in warm water, both for the ſake of moiſtening theſe ſubſtances, and to extract as much as poſſible the marine ſalts. They may be ſuffered to remain in water two or three minutes without any injury. After this bruſh them well, obſerving only that the bruſh muſt not be too hard. If that proves inſufficient to clean them, rub or bruſh them again with tripoli or emery, or put them into weak acid for the ſpace of a minute and then dip them into cold water; which proceſs may be repeated as often as will be neceſſary to remove the extraneous matter. Strong ſoap may alſo be uſed with a rag of woollen or linen cloth to rub them, or a ley of pearl-aſhes; and when cleaned finiſh them with a ſoft bruſh and fine emery.

Scientific collectors endeavour to preſerve one at leaſt of every ſhell with the epidermis on, to exhibit its natural appearance, together with the uncoated ſpecimens.

The epidermis may ſometimes be ſo thick that it will be neceſſary to take it off before the ſhell can be poliſhed. For this purpoſe pour a quantity of the ſpirits of nitre, or nitrous acid, into water, in the proportion of about one-ſixth or one-tenth part of the former; put this into a ſhallow baſon or ſaucer, and place the ſhell or ſhells therein, in ſuch a manner that the corroſive fluid may act only on the coat, without injuring the orifices or mouth, which in ſome caſes may be coated with bees-wax: change the ſituation of the ſhell every two or three minutes, that all the parts may be equally uncoated; wipe off the bubbles as occaſion may require with a feather, firſt dipped in water: when you perceive the enamel in any part free from the coat, take it out, and waſh off the aquafortis, and after this proceſs rub them with fine emery powder. If inſtead of a thick epidermis it is only a pellicle, it is ſufficient to ſteep it in hot water, and then pick it off; or ſteep the ſhell in vinegar till it peels off freely, or is corroded away. The epidermis of ſome ſhells is ſo coarſe and thick as to reſiſt the corroſive quality of acids diluted, or even of aqua-fortis; emery with ſtrong bruſhes is then ſubſtituted, or ſeal-ſkin, and pumice-ſtone, or the exterior coat may be ground off with a grind-ſtone, or files of various dimenſions. If the matter is too obſtinate to be cleared off by this means, pour ſome ſpirit of nitre into a cup or other veſſel, ſtop up every part of the ſhell that may be ſuſceptible of injury with ſoft wax, as carefully as poſſible, and put it into the liquor in the veſſel; remove it every minute into cold water, but obſerve never to ſhift it into the ſame water more than once, and waſh it every time before you return it into the corroſive liquor. If the ſhell is warted, irregular, or armed with points, examine it with a common magnifier, and if you perceive on the more prominent parts through the wax any appearance of the poliſhed ſurface, cover them with wax, and let the ſhell remain a few minutes longer in the ſpirit, take it out and waſh it again; after which, poliſh the ſhell with fine emery, and paſs a camel's-hair pencil with gum arabic over them to brighten the colours; the white of egg is ſometimes uſed, but it is very apt to turn yellow in time, though at firſt it appears glaring; and varniſh communicates a diſagreeable ſmell.

Some ſhells have naturally a ſlight politure; thoſe may be rubbed by the hand with chamois leather, which will give them a bright gloſſy appearance: avoid when poſſible the uſe of emery powder, as it is apt to detriment the beautiful workings on the ſhells; it cannot however be often left out of uſe.

It is deſirable as far as can be to point out the impoſitions which are often practiſed on thoſe who are not well acquainted with ſhells, and are therefore not aware that any individual ſhell may be made to aſſume a very different appearance by having the firſt or ſecond exterior coat of the ſhell removed by acids, or any other means. Thus, for example, we ſee that though the outer ſurface of the common cowry, or tide ſhell, is of a pale colour, with dark ſpots; when that is cleared off, it is of a fine violet colour: the ſea ears are clouded with brown, green, and white; but when that coat is rubbed away it appears of a beautiful pearl colour. Thus alſo the nautilus ſhell is externally of a pale brown or ochraceous hue, variegated with ſtreaks of cheſnut, but on the exterior coating being taken off, the whole ſhell will be found of that ſubſtance known by the familiar name of mother of pearl. The ſame circumſtance is obſerved of the true mother of pearl ſhell, the exterior coat of which is blackiſh; many of the trochi, or top ſhells, and an infinite variety of other ſhells of different genera are of the ſame deſcription. Among thoſe ſhells which alter their appearance moſt, we muſt not omit the volute, called by us the purple or violet tip, and by the French *onyx*; it has a brown epidermis which, being taken off, diſcovers the ground colour to be a dull yellow. When this is worked down to beneath the cruſt or ſurface, it is of a pure white, with the tip of a fine violet. We ſhall laſtly mention the common muſcle, the exterior coat of which is dull blueiſh black, that beneath purple, and the inner one white: ſometimes we have ſeen muſcles in the hands of dealers, and in ſcientific collections, of a fine purple colour, variegated with large diſtinct ſpots of white or brown, ſo dexterouſly managed as to have all the appearance of a ſhell in a natural ſtate, though in reality ſuch ſhells are the work of art, and no other than the common or edible muſcle. For this purpoſe thoſe of the largeſt ſize are uſually ſelected, which, being firſt uncoated down to the brighteſt purple ſurface, are afterwards fretted or rubbed with a file, in particular parts, till the white or inner coating is ſeen through the purple. The ſpots may be managed however with more certainty, by covering the whole ſurface with a thin coat of wax, then ſcraping off the wax in ſuch parts as it is deſigned ſhould exhibit ſpots, and laſtly ſuffering the ſhell to remain in ſpirit of ſalts diluted, or nitrous acid, till the outſide is corroded in thoſe parts down to the white or inner coat of the ſhell. After waſhing the ſhell, and clearing off the wax; the ſpots thus formed may be ſtained of any colour, according to the fancy of the operator. A preparation of the oxyd of iron, or mangane̔ſe, are moſt commonly employed, as theſe produce a brown colour of different tints, and form an indelible ſtain. The Dutch, who are great amateurs in conchology, paint ſhells with a variety of colours, and that ſo ingeniouſly, as to render it difficult to detect the impoſition. Neither are they leſs expert in joining broken ſhells, cementing and filling up holes pierced by marine worms, or fractures, and filling the mouths and tips in ſuch a manner as to entirely alter their appearance.

Foſſil ſhells ſhould be noticed here if any inſtructions were neceſſary for their preſervation; but theſe in general conſtitute the moſt durable part of a collection, being either chalky, caſts in flint or ſtone, or replacements of ſparry matter, with perhaps only ſome ſlight fragments of the ſhell adhering, and that very rarely. They are dug out of chalk-pits, lime-ſtone, or other ſtone-quarries, and coal-pits, &c. Vide "Donovan's Inſtructions for collecting and preſerving Subjects of Nat. Hiſt." from which the above particulars are chiefly extracted.

CONCHUCOS, in *Geography*, a juriſdiction of South America, in the vice-royalty of Peru, ſubject to the archbiſhop of Lima, which commences 40 leagues N.N.E. of Lima, and extends along the centre of the Cordilleras. Its air, therefore, is different according to the height of the ſituation of its ſeveral parts, the mildeſt of which produce all kinds of grains and fruits, and the others, where cold checks their fertility, afford paſture for all kinds of cattle. This juriſdiction abounds with looms: the principal occupation of the Indians being woollen manufactures of various kinds, which conſtitute the greateſt part of its commerce with other provinces.

CONCIATOR, in the *Glaſs Art*, is for the cryſtal glaſs what the founder is at the green glaſs-houſes. He is the perſon that weighs and proportions the ſalt on aſhes and ſand, and works them with a ſtrong fire, till they run into lumps, and become white; and if the metal be too hard, and conſequently brittle, he adds ſalt, or aſhes; and if too ſoft, ſand; ſtill mixing them to a fit temper, which is only known by the working.

CONCILIO.—*Querela eorum rege et* CONCILIO. See QUERELA.

CONCINNA, DANIEL, in *Biography*, an Italian Dominican, born in the Venetian territory about the year 1686. He was highly diſtinguiſhed for his pulpit talents, which attached to him numerous admirers in Italy, and even in Rome itſelf. As a writer he was eſteemed, on account of the ſupport which he gave to the inſtitutions of the Papal church. He was author of numerous publications in the Latin and Italian languages, on hiſtorical, moral, and critical ſubjects, among which are "Defenſio Concilii Tridentini, et Apoſt. Conſt. Eccle Rom. in cauſa Paupertatis Monaſticæ, &c." "Uſura Contractus trini Diſſertationis Hiſt. Theol. demonſtrata," &c. "De Spectaculis Theatralibus Chriſtiano cuiquam, tum Laico, tum Clerico, vetitis, &c." "Theologia Chriſtiana, dogmatico-moralis," in 12 vols. 4to. "Theological, Moral, and Critical Diſſertations, relative to the Logic of Probabilities, with Supplementary Obſervations." "A Defence of Revealed Religion, &c." He died at Venice in the year 1756. Nouv. Hiſt. Dict.

CONCINNOUS *Intervals*, in *Muſic*, are ſuch as are apt and uſeful in harmony, as the V., 4th, III., 3d, VI., 6th, IV. and 5th, in contradiſtinction to ſuch as are inconcinnous, as the intervals deficient or redundant by a comma. See COMMA-*Redundant*, *Fifth*, *Fourth*, &c.

CONCINO Concini, Marshal D'Ancre, in *Biography*, was a native of Tuſcany, and, with his wife, Leonora Galigai, accompanied Mary de Medicis, queen of Henry IV. into France, in 1660. He was made gentleman of the bed-chamber, governor of Normandy, and marſhal of France, in 1615. As he was raiſed by the influence which he attained over the mind of the queen, he held the reins of government during the minority of Louis XIII. and behaved in ſo haughty a manner to the young king, that he was induced to order his arreſt, and in caſe of reſiſtance, the perſon ſent on the buſineſs was commanded to kill him. The captain of the guard demanded his ſword as he was paſſing the drawbridge of the Louvre, and upon his refuſing to comply, he ſhot him dead, April 24, 1617. His body, after it had been buried, was taken up and given to the populace, who treated it with every indignity. His wife was afterwards condemned, by a decree of the parliament, to be hanged and burnt. Moreri.

CONCIOLO, an Italian painter, who flouriſhed in the commencement of the thirteenth century. Upon a picture at Subiaco, in the Eccleſiaſtical State, repreſenting the conſecration of a church, the artiſt has thus ſigned his name, Conxiolus pinxit, 1219. This is one amongſt the many proofs, with which the churches and converts of Italy abound, to ſhew that however low the ſtate of the arts in Europe, previous to Cimabue and Giotto, the intervention of Greek painters was by no means neceſſary to their eſtabliſhment. Lanzi. Storia Pittorica.

CONCIONATORES, in *Antiquity*, common-councilmen, freemen, called to the hall or aſſembly, as moſt worthy. Thus, "quodam tempore cum conveniſſent *concionatores* apud London, &c." Hiſt. Elien. apud Gale, c. 46.

CONCLAMATIO, a ſhout raiſed by thoſe preſent at burning the dead, before they ſet fire to the funeral pile. See Shout. The word was alſo applied to the ſignal given to the Roman ſoldiers to decamp, whence the expreſſion "conclamare vaſa;" and "conclamari arma" was a ſignal for battle. It was likewiſe uſed for a practice of calling to a perſon deceaſed three times by his name, and when no reply was returned, they thus expreſſed his deceaſe, "conclamatum eſt." Whence the ſame term was afterwards applied to the ceſſation of the Roman empire.

Conclamatio, among the Greeks, Romans, and ſeveral other nations, was a ſpontaneous cry or ſhout, which all the ſoldiers of an army made when they underſtood or heard the third ſignal for combat.

CONCLAVE, an aſſembly or meeting of all the cardinals that are at Rome, ſhut up for the election of a pope; whence it derives its name. See Cardinal.

The conclave had its riſe in the year 1270, and on this occaſion; Clement IV. being dead at Viterbo, in 1268, the cardinals were nearly three years, *viz.* from the 29th of November 1268, to the 1ſt of September 1271, without being able to agree on the election of a ſucceſſor; in effect, things were carried to ſuch paſs that they were upon the point of breaking up, without coming to any concluſion at all.

The magiſtrates of Viterbo, being appriſed of their deſign, by the advice of St. Bonaventure, then at Viterbo, ſhut the gates of their city, and locked up the cardinals in the pontifical palace adjoining to the cathedral, till they were brought to a better underſtanding.

Hence aroſe the cuſtom, which has ſince prevailed, of ſhutting up the cardinals in a ſingle palace, till they have elected the pope.

Such was the origin of the conclave, as related by Onuph. Panvinius, Ciaconius, and Papebroch.

Panvinius informs us, that John of Toledo, cardinal biſhop of Porto, ſeeing the cardinals daily praying the Holy Ghoſt to inſpire them with the ſpirit of concord and union, and yet diſcord continuing to reign among them, ſaid pleaſantly, "Let us uncover the room, elſe the Holy Ghoſt will never get at us." When this ſarcaſtic remark was reported to the magiſtrates of Viterbo, they immediately ordered the roof of the room in which the cardinals were aſſembled, to be taken off, hoping that this new inconvenience would oblige them to haſten the election; but their obſtinacy prevailed againſt all inconveniences, till the magiſtrates bethought themſelves of daily leſſening their ſubſiſtence; and this had the deſired effect. For being thus reduced to the alternative of ſtarving or agreeing, they left the election by compromiſe to ſix of their number; and then Gregory X. was elected.

Conclave is alſo uſed for the place wherein the election of the pope is performed; which is now at St. Peter's in the Vatican; though Gregory X. and Clement V. appointed it ſhould always be held in the place where the laſt pope ſhould die. But if he ſhould die in a borough or village, where the electors could not conveniently meet, the election was to take place in the epiſcopal city, or in the neareſt to it, if that city were under an interdict.

While the affair is in hand, if it be in winter, the walls and windows are all mured up, excepting only a ſingle pane, to give a little light; in ſummer the windows are not cloſed; but the great door of the hall is ſecured with four locks and four bolts; an aperture being, however, left, through which to ſupply the impriſoned prelates with victuals.

If the election takes place at Rome, the door of the conclave, and all the avenues to it are to be carefully guarded by the city-guards, by the Roman nobility, by the ambaſſadors of princes, and by the biſhops and conſervators of the city. If the election is to be made out of Rome, the ſame duty is incumbent upon the temporal lords and magiſtrates of the place; and it is a duty common to them all to ſee that nothing be carried into the conclave, or out of it, that has the leaſt tendency to retard or prevent a lawful election.

In the hall, which is very ample, there are cells or ſtalls erected for as many cardinals as are to be preſent at the election; the cells being only ſeparated by deal boards, and the room having no outlet, except to the privy.

The cells are marked with letters of the alphabet, and are diſtributed to the cardinals by lot: each cardinal puts his arms on the cell that falls to his ſhare.

No one ſhall be allowed to go into the common room or conclave, nor out of it, but in caſe of ſickneſs, or on ſome other urgent occaſion.

After the aſſembly has continued three days, they are only allowed one diſh for a meal; and after fifteen days more, only bread, wine, and water, though this rule is not very ſtrictly regarded.

Each cardinal is allowed two concláviſts, or ſervants to attend him, and to be ſhut up with him.

The election is begun ten days after the pope's deceaſe, and decided by a majority of two parts in three of the cardinals preſent, who vote by ballot; and if, upon ſcrutiny, no one of the candidates has two-thirds of the votes, the balloting muſt, after a ſtated interval, be repeated. And this continues to be reiterated if they ſhould remain ſhut up for years, till one of them attains the fore-mentioned ſuperiority. Cardinals who arrive before the election is finiſhed, are incloſed with the reſt.

Theſe regulations were principally eſtabliſhed by Gregory X. in 1274. But as this conſtitution of Gregory X.

was thought by the cardinals to be too rigorous, they prevailed upon Clement VI. in the year 1351, not long before his death, to mitigate it. Clement allowed them to have each two ſervants, clerks, or laymen; to have curtains round their beds, and one diſh of fleſh or fiſh at dinner, and another at ſupper, beſides bread, wine, fruit, and ſweetmeats, ſo long as they continued in the conclave.

Matthew Paris ſays, the word conclave anciently ſignified the pope's wardrobe.

It is a popular proverb in Italy, *chi entra papa, eſce cardinale;* he who enters pope, comes out cardinal; q. d. he who according to common report will be elected pope, ordinarily is not.

We have various accounts, both by proteſtant and popiſh writers, of the intrigues that have been practiſed in the conclave, during conteſted elections. What is ſaid to have paſſed upon the deceaſe of Alexander VII. is no tale invented by proteſtants, but related by grave Roman catholics, *viz.* that on the laſt day, cardinal Sforza, going into the conclave, aſked another cardinal, his intimate friend, what he thought would be the iſſue? He returned this frank anſwer: "Signior cardinal, if the French make the pope, he will be cardinal Farneſe; if the Spaniards, cardinal Roſpiglioſi; if he is made by the people of Rome, he will be cardinal Barberini; if the Holy Ghoſt appoints him, cardinal Odeſchalchi will be the man; if the devil has a hand in it, he muſt be your eminence, or myſelf." Upon this, Sforza replied with a laugh, "then Roſpiglioſi will be the man;" and he was accordingly choſen by the name of Clement IX. In the year 1724, upon the death of Innocent XIII, the following ſatirical diſtinction was made between the candidates for the papal throne:

"Il Cielo vuol Orſini
Il popolo Corſini
Le Donne Ottoboni
Il Diavolo Alberoni."

i.e. "Heaven is for Orſini,
The people for Corſini,
The ladies for Ottoboni,
The devil for Alberoni."

But Orſini was choſen by the name of Benedict XIII. Keyſler's Trav. vol. ii. p. 109.

CONCLUSION, in *Law*, is where a man by his own act upon record hath charged himſelf with a duty or other thing, or confeſſed any matter whereby he ſhall be concluded: as if a ſheriff returns that he hath taken the body upon a capias, and hath not the body in court, at the day of the return of the writ; by the return, the ſheriff is concluded from plea of eſcape, &c. Terms de Ley, 153, &c. In another ſenſe the word concluſion ſignifies the end of any plea, replication, &c. and a plea to the writ, is to conclude to the writ; a plea in bar, to conclude to the action, &c. Concluſion of plea in bar ſhall be, *et hoc paratus eſt verificare:*—of other pleas *et de hoc ponit ſe ſuper patriam.* Kitch. 219, 220. See PLEA.

CONCLUSION *of deeds*, mentions the execution and date of the deed, or the time of its being given or executed, either expreſsly, or by reference to ſome day and year before-mentioned. Not but a deed is good, although it mention no date, or hath a falſe date; or even if it hath an impoſſible date, as the 30th of February; provided the real day of its being dated or given, that is delivered, can be proved.

CONCLUSION, in *Logic*, the laſt part of an argument; or the conſequence drawn from ſomething either aſſumed or proved before.

The concluſion of an argument contains two parts: the conſequent, which is the matter of it; and the conſequence, which is its form, and which, of a ſimple abſolute propoſition, renders the concluſion relative to the premiſes whence it is drawn.

The queſtion and concluſion, ſay the ſchoolmen, are the ſame ideas, only conſidered in different views, or relations: in the queſtion they are conſidered as doubtful; in the concluſion as void of doubt.

CONCLUSION, in *Oratory*, conſiſts of two parts; the RECAPITULATION, or ENUMERATION, and the PASSIONS. See alſo PERORATION.

CONCLUSIONS *d'une procedure militaire*, Fr. See the article JUDGE *Advocate*.

CONCOBAR, in *Ancient Geography*, a town of Aſia, in Upper Media, towards the S.W. of Ecbatana.

CONCOCTION, in the *Animal Economy*, a term uſed by the older writers to denote the proceſs which the food undergoes in the ſtomach, and by which it is converted into chyme and chyle. This proceſs is now more uſually termed DIGESTION, which ſee.

CONCOCTION, in the *Pathology* of Hippocrates and Galen, and their numerous followers, was alſo employed to ſignify certain changes in the fluids in the courſe of acute diſeaſes, from a ſuppoſed analogy between the changes, and thoſe which the aliments undergo in the ſtomach during digeſtion. The proceſs of concoction may be particularly illuſtrated in the caſe of a common phlegmon, or boil; the progreſs of which is marked, according to Galen, by four diſtinct ſtages. The firſt, or *incipient* ſtage, when theſe fluids are beginning to collect, is conſidered as the ſtage of crude and unchanged humours: in the ſecond, or ſtage of *increaſe*, in conſequence of the proceſs of concoction, heat is diffuſed through the part, and the pain, tenſion, and tumour are increaſed: when the humours are completely concocted, and converted into *pus*, the ſtage of the phlegmon is ſaid to be *ſtationary*, or the diſeaſe to be in its vigour: and the fourth ſtage is that, in which the tenſion and tumour become leſs, and which is termed the *decline* of the ſwelling. A ſimilar progreſs is obſervable in almoſt all inflammatory diſeaſes. Thus in catarrh, affecting the mucous membrane of the noſe, the diſcharge in the commencement is thin and watery, and, in the language of the humoral pathology, *crude;* by degrees a thicker and more opake matter is diſcharged, which at length (becoming completely concocted), aſſumes a very thick and purulent appearance, which betokens the decline of the diſeaſe. Such alſo is the progreſs of change in the fluids expectorated in inflammations of the lungs and bronchiæ, diſcharged from the eyes in ophthalmia, &c. By an analogy ſomewhat remote, this doctrine was transferred to febrile complaints, where no local inflammation, or depoſitary of morbid concocting matter, exiſted. In an idiopathic fever, as ſynochus or typhus, the alvine excrements, the urine, and the diſcharge from the ſkin, were referred to, as evidence of the proceſs of concoction; and the varieties of the appearance of theſe diſcharges are deſcribed by Hippocrates, and his commentator Galen, as denoting the ſtates of crudity and of concoction, and hence as affording a prognoſis of the future progreſs and event of the diſeaſe. The alvine excrement is ſaid to be well concocted, when it is, as in health, ſoft and connected, and is diſcharged with the uſual regularity. When it is not in this ſtate, but liquid and watery, partly liquid, partly ſolid, &c. it is conſidered as not concocted, and therefore indicating the unhealthy condition of the bowels, through which it had paſſed. And thus, with reſpect to the urine, when it is extremely thin and limpid, it is ſaid to be crude; and when it is ſlightly tinged with yellow, it is conſidered as having undergone a ſmall degree of concoction, which is ſtill more complete, if it ſoon depoſits a moderate ſediment. But the ſigns of concoction in the urine were ſaid to be different in the young and the old, and different alſo in different diſeaſes. Thus in bilious and ſummer fevers, a light cloud ſuſpended in the urine was deemed the ſign of concoction; in inflammatory fevers, a white ſediment. See Galen, de Tot. Morbi. Tempor. et de Criſibus, lib. i.

CONCOLIN, in *Geography*, a town of France, in the department of the Iſere; 4½ leagues N.E. of Grenoble.

CONCOMITANT, in *Theology*, ſomething that accompanies, or goes along with, another.

Concomitant grace, is that which God affords us during the courſe of our actions to enable us to perform them; and as the Roman ſchoolmen ſay, to render them meritorious.

CONCOMITANT *Neceſſity*. See NECESSITY.

CONCORD, FORM OF, in *Eccleſiaſtical Hiſtory*, a ſtandard-book among the Lutherans, compoſed at Torgaw, in 1576, and thence called the Book of Torgaw, and reviewed at Berg, by ſix Lutheran doctors of Germany, the principal of whom was James Andreæ. This book contains in two parts, a ſyſtem of doctrine, the ſubſcription of which was a condition of communion, and a formal and very ſevere condemnation of all who differed from the compilers of it, particularly with reſpect to the majeſty and omnipreſence of Chriſt's body, and the real manducation of his fleſh and blood in the euchariſt. It was firſt impoſed on the Saxons by Auguſtus, and occaſioned great oppoſition and diſturbance, both among the Lutherans and Reformed.

Several of the moſt eminent churches of the Lutheran communion rejected it ſo firmly and reſolutely, that no arguments nor intreaties could engage them to admit it as a rule of faith, or even as a mean of inſtruction. Accordingly, it was rejected for various reaſons, by the churches of Heſſia, Pomerania, Nuremberg, Holſtein, Sileſia, Denmark, Brunſwick, and others. Among the Reformed, or Calviniſts, the Swiſs doctors, at the head of whom was Hoſpinian, the Belgic divines, thoſe of the Palatinate, together with the principalities of Anhalt and Bade, declared war againſt it. This form of concord, however, was patronized in a ſpecial manner by Julius, duke of Brunſwick, to whom, in a great meaſure, it owed its exiſtence; and who employed his authority and munificence in encouraging thoſe by whom it was compoſed, and in commanding all the eccleſiaſtics, within his dominions, to receive and ſubſcribe it as a rule of faith. But ſoon after it was publiſhed, this zealous prince changed his mind, ſuffered it to be publicly expoſed by the divines of his univerſity of Helmſtadt, and to be excluded from the number of creeds and confeſſions that were received by his ſubjects. Various means were uſed to obviate his objections; and particularly in the year 1583, a convocation of divines from Saxony, Brandenburg, Brunſwick, and the Palatinate, was held at Quedlinburg for this purpoſe. But Julius perſiſted in his oppoſition, and propoſed that the form of concord ſhould be examined, and its authority diſcuſſed by a general aſſembly or ſynod of the Lutheran church.

In the year 1614, John Sigiſmund, elector of Brandenburg, following the example of the landgrave of Heſſe, renounced Lutheraniſm, and, under certain reſtrictions, embraced the communion of the Reformed churches. This event occaſioned a diſpute, which was agitated with violence, and which occaſioned the form of concord to be ſuppreſſed in the territories of Brandenburg, and the ſubjects of that electorate to be prohibited, by a ſolemn edict, from ſtudying divinity in the academy of Wittemberg. Towards the cloſe of the 17th century, *viz.* in the year 1675, a new confeſſion of faith was drawn up by the Helvetic divines, under the denomination of the "form of concord or of agreement," which was alſo entitled the "Conſenſus;" but the introduction of it occaſioned conteſts and tumults in ſeveral places. It maintained, however, its credit and authority in the church of Geneva, until the year 1706, when, without being abrogated by any poſitive act, it fell into diſuſe. In ſeveral other parts of Swiſſerland, it was ſtill impoſed as a rule of faith, particularly in 1718, by the magiſtrates of Bern, who publiſhed an order, by which all profeſſors and paſtors, particularly thoſe of the univerſity and church of Lauſanne, who were ſuſpected of entertaining any erroneous opinions, were obliged to declare their aſſent to this formulary. Many paſtors and candidates for holy orders refuſed the aſſent that was demanded by the magiſtrates, and ſome of them were puniſhed for this refuſal. In conſequence of theſe warm conteſts and grievous complaints letters were addreſſed by George I., king of England, as alſo by the king of Pruſſia, in the year 1723, to the Swiſs cantons, in order to procure the abrogation of this form, or conſenſus, which was conſidered as an obſtacle to the union of the Reformed and Lutheran churches. Moſheim's Eccl. Hiſt. by Dr. Maclaine, vol. iv. v. vi.

CONCORD, in *Geography*, a flouriſhing poſt-town of America, in New Hampſhire, pleaſantly ſituated on the W. bank of Merrimack river, in Rockingham county, eight miles above Hookſet falls. The legiſlature has, of late, held its ſeſſions here; and on account of its central ſituation in the front of a thriving country, it will probably become the permanent ſeat of government. Much of the trade of the upper country centers here. This town is connected with Pembroke by a handſome bridge acroſs the Merrimack. Concord was incorporated in 1765, and has 1747 inhabitants. Its Indian name was "Penacook." It was granted by Maſſachuſetts, and called "Rumford." The compact part of the town contains about 170 houſes, a congregational church, and an academy, which was incorporated in 1790. It is 54 miles W.N.W. of Portſmouth, 58 S.W. of Dartmouth college, and 70 northward from Boſton. N. lat. 43° 12′. W. long. 71° 29′.

CONCORD, a town of America in the ſtate of Vermont and county of Eſſex, lying on Connecticut river, oppoſite to a part of the 15 mile falls.

CONCORD, a poſt-town of America, in the ſtate of Maſſachuſetts, being one of the moſt conſiderable towns in Middleſex county, ſituated on Concord river, in a healthy and pleaſant ſpot, nearly in the centre of the county, and 18 miles N.W. of Boſton, and 17 E. of Lancaſter. Its Indian name was Muſquetequid; and it owes its preſent name to the peaceable manner in which it was obtained from the natives. It was incorporated in 1635; being at that time the moſt diſtant ſettlement from the ſea-ſhore of New England. In 1791 this townſhip contained 225 dwelling houſes and 1590 inhabitants; and as a proof of the ſalubrity of its ſituation, 80 of the number were above 70 years old; and for 13 years before 1791, the average number of deaths was 17, one in four of whom was 70 years old or upwards. The public buildings are a congregational church, a ſpacious ſtone gaol, and a very handſome county court houſe. The river is croſſed by three bridges, of which one is 208 feet long and 18 feet wide, ſupported by 12 piers, and built after the manner of Charles river bridge. This town, during the revolution, was the ſeat of the provincial congreſs in 1774, and the ſpot where the firſt oppoſition was made to the Britiſh troops, on the 19th of April 1775. The grand court has been held here, when contagious diſeaſes have prevailed in the capital. N. lat. 42° 25′.

Concord, a ſmall river of Maſſachuſetts, formed of two branches, which unite near the centre of the town of Concord, whence it takes its courſe in a N.E. and N. direction through Bedford and Billerica, and empties itſelf into Merrimack river at Tewſkbury. This river is remarkable for the gentleneſs of its ſcarcely perceivable current. At low water mark it is from 100 to 200 feet wide, and from 3 to 12 feet deep. During floods it is nearly a mile in breadth: and when viewed from the town of Concord, exhibits a fine appearance.

Concord, a townſhip of Delaware county in the ſtate of Pennſylvania.

Concord, a ſettlement in Georgia, on the E. bank of the Miſſiſſippi, about a mile from the ſouth line of Tenneſſee, 108 miles N. from the mouth of Yazoo river, and 218 below the Ohio. N. lat. 33° 55′. W. long. 91° 25′.

Concord, in *Grammar*, that part of ſyntax, or conſtruction, whereby the words of a ſentence agree among themſelves, *i. e.* whereby nouns are put in the ſame caſe, number, gender, &c. and verbs in the ſame number and perſon, with nouns and pronouns.

The rules of concord are generally the ſame in all languages, as being of the nature of what is in uſe almoſt everywhere, for the better diſtinguiſhing of diſcourſe.

Thus, the diſtinction of the two numbers ſingular and plural obliges us to make the adjective agree with the ſubſtantive in number; that is, to put the one either in this or that number, according as the other is: for the ſubſtantive being the thing confuſedly, though directly, marked by the adjective; if the ſubſtantive word mark ſeveral, there are ſeveral ſubjects of the form marked by the adjective, and of conſequence this ſhould be in the plural; as *homines docti*, &c.

Again, the diſtinction of maſculine, and feminine, renders it neceſſary to put the ſubſtantive and adjective in the ſame degree.

And verbs ſhould have concord or agreement with nouns and pronouns in number and perſon.

If any thing occur apparently contrary to theſe rules, it is by a figure; *i. e.* ſomething is implied, or the ideas are conſidered more than the words themſelves. See Syntax.

Concord, *Order of*, in *Heraldry*, was inſtituted by Chriſtian-Erneſt, Margrave of Brandenburgh, on his return from Spain, in the year 1660, to diſtinguiſh the part he had taken in reſtoring peace and union to many European princes. The badge of the order is a gold croſs of eight points enamelled white, ſurmounted by an electoral crown; in the centre of the croſs a medal thereon, two olive branches paſſing ſaltierwiſe through two crowns: around the medal the motto *concordans*. On the reverſe the founder's cypher with the date of the inſtitution. This badge is worn pendent from an orange ribbon.

Concord, in *Law*, is the agreement between parties who intend the levying a fine of lands to one another, how and in what manner it ſhall paſs. This is uſually an acknowledgment from the deforciants (or thoſe who keep the other out of poſſeſſion) that the lands in queſtion are the right of the complainant. And from this acknowledgment or recognition of right, the party levying the fine is called the *cognizor*, and he to whom it is levied the *cognizee*. This acknowledgment muſt be made either openly in the court of common pleas, or before the lord chief-juſtice of that court; or elſe before one of the judges of that court; or two or more commiſſioners in the country, empowered by a ſpecial authority, called a writ of "dedimus poteſtatem;" by which judges and commiſſioners are bound by ſtatute 18 Edw. I. ſt. 4. to take care that the cognizors be of full age, ſound memory, and out of priſon. If there be any feme-covert among the cognizors, ſhe is privately examined whether ſhe does it willingly and freely, or by compulſion of her huſband.

Concord, is alſo an agreement made upon any treſpaſs committed (betwixt two, or more); and is divided into *concord executory*, and *concord executed*. Theſe concords or agreements are by way of ſatisfaction for the treſpaſs, &c.

Plowden obſerves, that the firſt binds not, being imperfect; but the latter is perfect, and binds the party.

Others are of opinion, that concords executory are perfect, and bind no leſs than thoſe executed.

Concord, in *Muſic*, denotes the relation of two ſounds which are always agreeable to the ear, whether heard in ſucceſſion or conſonance.

If two ſingle ſounds be in ſuch a relation, or have ſuch a difference of tone, as that, being ſounded together, they make a mixture, or compound ſound, which affects the ear with pleaſure; that relation is called *concord*: and whatever two ſounds make an agreeable compound in conſonance, thoſe ſame ſounds will always be pleaſing in ſucceſſion, or will follow each other agreeably.

The reverſe of concord is what we call *diſcord*; which is the general denomination of all the relations or differences of tone that have no pleaſing effect.

Concord and harmony are, in effect, the ſame thing; though cuſtom has applied them differently. As concord expreſſes the agreeable effect of two ſounds in conſonance: ſo harmony expreſſes the ſame ſort of agreement in a great number of ſounds in conſonance: add, that harmony always implies conſonance; but concord is ſometimes applied to ſucceſſion, though never but when the tones will make an agreeable conſonance; whence it is, that Dr. Holder, and ſome other writers, uſe the word conſonance for what we call concord.

Uniſonance, then, being the relation of equality between the tones of two ſounds, all the uniſons are concords, and in the firſt degree; but an interval being a difference of tone, or a relation of inequality between two ſounds, becomes a concord or diſcord, according to the circumſtances of the particular relation. Indeed ſome reſtrain concord to intervals, and make a difference of tone conſtitute the eſſential difference of concord and diſcord; but two uniſons cannot form an interval.

It is not eaſy to affirm the reaſon or foundation of concordance: the difference of tone, we have elſewhere obſerved, takes its riſe from the different velocity of the vibrations of the ſonorous body, *i. e.* of the velocity of thoſe vibrations in their recourſes; the more frequent their recourſes are, the more acute will be the tone, and *vice verſâ*.

But the eſſential difference between concord and diſcord lies deeper: there does not appear any natural aptitude in the two ſounds of a concord, to determine it to give us a pleaſing ſenſation, more than in the two ſounds of a diſcord: theſe different effects are merely arbitrary, and muſt be reſolved into the divine pleaſure.

We know by experience what proportions and relations of tone afford pleaſure, and what do not; and we know alſo how to expreſs the difference of tone by the proportion of numbers; we know what it is pleaſes us, though we do not know why: we know, *v. gr.* that the ratio of 1 : 2 conſtitutes concord, and 6 : 7 diſcord: but on what original grounds agreeable or diſagreeable ideas are connected with thoſe relations, and the proper influence of the one on the other, are above our reach.

By experience we know, that the following ratios of the lengths of ſtrings are all concord; *viz.* 2 : 1, 3 : 2, 4 : 3, 5 : 4, 6 : 5, 5 : 3, 8 : 5; that is, take any ſtring for a fundamental, which ſhall be repreſented by the number 1, and the following diviſions thereof will be all concord with the whole; *viz.* $\frac{1.2.3\text{[illegible]}3.5}{2.3.4.5.6.5.8}$.

So that the diſtinguiſhing character between concords and diſcords muſt be looked for in theſe numbers, expreſſing the intervals of ſound; not abſtractedly and in themſelves, but as expreſſing the number of vibrations. Now, uniſons are in the firſt degree of concord, or they have the moſt perfect likeneſs or agreement in tone; and therefore have ſomething in them acceſſory to that agreement which is found, leſs or more, in every concord: the nearer two ſounds come to an equality of tone, the ſlower are the beats, and the more agreement they have; therefore, it is not in the equality or inequality of the numbers that this agreement lies.

Further, if we conſider the number of vibrations made in any given time by two ſtrings of equal tone; on the principle laid down, they are equal: and therefore the vibrations of the two ſtrings coincide, or commence together as frequently as poſſible, *i. e.* they coincide at every vibration; in the frequency of which coincidence, or united mixture of the motions of the two ſtrings, and of the undulations of the air which they occaſion, it is, that the difference of concord and diſcord muſt be ſought. Now, the nearer the vibrations of two ſtrings approach to a coincidence as frequent as poſſible, the nearer they ſhould approach that condition, and conſequently the agreement of uniſons; which is confirmed by experience.

For if we take the natural ſeries 1, 2, 3, 4, 5, 6, and compare each number to the next, as expreſſing the number of vibrations in the ſame time of two ſtrings, whoſe lengths are reciprocally as thoſe numbers; the rule will be found exact, for 1 : 2 is beſt, then 2 : 3; after 6 the union is unſufferable; the coincidences being too rare: though there are other ratios that are agreeable, beſides thoſe found in that continued order, *viz.* 3 : 5, and 5 : 8, which, with the preceding five, are all the concording intervals within, or leſs than an octave, or 1 : 2; that is, whoſe acuteſt term is greater than half the fundamental.

On this principle, 3 : 5 will be preferable to 4 : 5; becauſe thoſe being equal in the number of vibrations of the acuter term, there is an advantage on the ſide of the fundamental in the ratio 3 : 5, where the coincidence is made at every third vibration of the fundamental, and every fifth of the acute term: ſo alſo the ratio 5 : 8 is leſs perfect than 5 : 6; becauſe, though the vibrations of each fundamental that go to one coincidence are equal; yet in the ratio 5 : 6, the coincidence is at every ſixth of the acute term, and only at every eighth in the other caſe.

Thus, we have a rule for judging of the preference of concords, from the coincidence of their vibrations: agreeable to which rule, they are diſpoſed into the order of the following table; to which the names of the concords in practice, the ratio of their vibrations, the lengths of the ſtrings, and the number of coincidences in the ſame, are expreſſed.

Ratios, or vibrations.				
	Grave Term.		Acute Term.	Coincid.
Uniſon	1	:	1	
Octave, 8ve	2	:	1	60
Fifth, 5th	3	:	2	30
Fourth, 4th	4	:	3	20
Sixth, gr.	5	:	3	20
Third, gr.	5	:	4	15
Third, leſſer	6	:	5	12
Sixth, leſſer	8	:	5	12
	Grave		Acute	
	Lengths.			

Though this order be ſettled by reaſon, yet it is confirmed by the ear. On this foundation, concords muſt ſtill be the more perfect, as they have the greateſt number of coincidences, with regard to the number of vibrations in both the ſtrings; and where the coincidences are equal, the preference will fall on that interval, whoſe acuteſt term has feweſt vibrations to each coincidence: which rule, however, is in ſome caſes contrary to experience; and yet it is the only rule hitherto diſcovered.

Indeed, Kircher, after father Merſenne, gives us another ſtandard for ſettling the comparative perfection of intervals with regard to the agreement of their extremes in tone: and it is this.

The perception of concordance, ſay they, is nothing but the comparing two or more different motions which in the ſame time affect the auditory nerve: now we cannot make a certain judgment of any conſonance, till the air is as often ſtruck in the ſame time by two ſtrings, as there are units in each member expreſſing the ratio of that concord; *v. gr.* we cannot perceive a fifth, till two vibrations of the one ſtring, and three of the other, are accompliſhed together; which ſtrings are in length as 3 to 2: the rule then is, that thoſe concords are the moſt ſimple and agreeable, which are generated in the leaſt time; and thoſe, on the contrary, the moſt compound and harſh, which are generated in the longeſt time.

For inſtance, let 1, 2, 3, be the lengths of 3 ſtrings, 1 : 2 is an octave; 2 : 3 a fifth; and 1 : 3 an octave and fifth compounded, or a twelfth. The vibrations of ſtrings being reciprocally as their lengths, the ſtring 2 will neceſſarily vibrate once, while the ſtring 1 vibrates twice, and then exiſts an octave; but the twelfth does not yet exiſt, becauſe the ſtring 3 has not vibrated once, nor the ſtring 1 thrice, which is neceſſary to form a twelfth.

Again, for generating a fifth, the ſtring 2 muſt vibrate thrice, and the ſtring 3 twice; in which time, the ſtring 1 will have vibrated 6 times; and thus the octave will be thrice produced, while the twelfth is only produced twice; the ſtring 2 uniting its vibrations ſooner with the ſtring 1, than with the ſtring 3; and they being ſooner conſonant than the ſtring 1 or 2 with that 3. Whence, that author obſerves, many of the myſteries of harmony, relating to the performance of harmonious intervals, and their ſucceſſion, are eaſily deduced.

But this rule, upon examining it by other inſtances, Mr. Malcolm has ſhewn defective, as it does not anſwer in all poſitions of the intervals with reſpect to each other; but a certain order, in which they are to be taken, being required: and there being no rule, with reſpect to the order, that will make this ſtandard anſwer to experience in every caſe: ſo that at laſt we are left to determine the degrees of concord by experience and the ear.

Not but that the degrees of concord depend much on the more or leſs frequent uniting the vibrations, and the ear's being more or leſs uniformly moved, as above; for that this mixture or union in motion is the true principle, or, at leaſt, the chief ingredient in concord, is very evident: but becauſe there ſeems to be ſomething farther in the proportion of the two motions neceſſary to be known, in order to fix a catholic rule for determining all the degrees of concord, agreeable to ſenſe and experience.

The reſult of the whole doctrine is ſummed up in this definition.—Concord is the reſult of a frequent union, or coincidence of the vibrations of two ſonorous bodies, and, by conſequence, of the undulating motions of the air, which, being cauſed by theſe vibrations, are like and proportionable to them; which coincidence, the more frequent it is, with regard to the number of vibrations of both bodies, performed in the ſame time, *cæteris paribus*, the more perfect is that concord: till the rarity of the coincidence, in reſpect of one or both the motions, produces diſcord. See ſome of the remarkable phenomena of ſounds accounted for from this theory, under the word Unison; ſee alſo Interval, &c.

Mr. Carre, in the Memoirs of the Royal Academy of Sciences, lays down a new general propoſition, to determine the proportion which cylinders are to have, in order to form the concords or conſonances of muſic. And it is this—that the ſolid cylinders, whoſe ſounds yield thoſe concords, are in a triplicate and inverſe ratio of that of the numbers which expreſs the ſame concords.

Suppoſe, *e. gr.* two cylinders, the diameters of whoſe baſes and lengths are as 3 to 2: it is evident their ſolidities will be in the ratio of 27 to 8, which is the triplicate ratio of 3 to 2: we ſay then, that the ſounds of thoſe two cylinders will produce a fifth, which is expreſſed by thoſe numbers; and that the biggeſt and longeſt will yield the grave ſound, and the ſmalleſt the acute one.—And the like of others.

Concords are divided into *ſimple*, or original, and *compound*.

A *ſimple*, or *original* concord, is that whoſe extremes are at a diſtance leſs than the ſum of any two other concords.

On the contrary, a *compound* concord is equal to two or more concords.

Other muſical writers ſtate the diviſion thus: an octave 1 : 2, and all the inferior concords above expreſſed, are all ſimple and original concords: and all greater than an octave, are called compound concords; as being compoſed of, and equal to the ſum of one or more octaves, and ſome ſingle concord leſs than an octave; and are uſually, in practice, denominated from that ſimple concord.

As to the compoſition and relations of the original concords, by applying to them the rules of the addition and ſubtraction of intervals, they will be divided into *ſimple* and *compound*, according to the firſt and more general notion; as in the following table.

Simple Concords	Compound Concords.			
5 : 6 a 3d leſſ.	4th	3dg. and 3dl.	8ve. compoſed of	5th 4th or 6th g. 3dl. or 3d. g. 3d. l. 4th.
4 : 5 a 3d gr.	6th l.	4th. 3dl.		
3 : 4 a 4th.	5th g.	4th. 3 g.		

The octave is not only the firſt concord in point of perfection, the agreement of whoſe extremes is greateſt and the neareſt to uniſon; inſomuch that, when ſounded together, it is impoſſible to perceive two different ſounds; but it is alſo the greateſt interval of the ſeven original concords; and, as ſuch, it contains all the leſſer, which derive their ſweetneſs from it, as they ariſe more or leſs directly out of it; and which decreaſe gradually, from the octave to the leſſer ſixth, which has but a ſmall degree of concord.

A remarkable circumſtance is the manner wherein theſe minor concords are found in the octave, which ſhews their mutual dependences.

For, by taking both an harmonical and arithmetical mean between the extremes of the octave, and then both an harmonical and arithmetical mean betwixt each extreme, and the moſt diſtant of the two means laſt found; viz. betwixt the leſſer extreme and the firſt arithmetical mean, and betwixt the greater extreme and the firſt harmonical mean; we have all the leſſer concords.

Thus, if betwixt 360 and 180, the extremes of octave, we take an arithmetical mean, it is 270; and an harmonical mean is 240: then, betwixt 360 the greateſt extreme, and 240 the harmonical mean, take an arithmetical mean, it is 300; and an harmonical mean is 288. Again, betwixt 180 the leſſer extreme of the octave, and 270 the firſt arithmetical mean, it is 225, and an harmonical one 216.

Thus, we have a ſeries of all the concords, both aſcending towards acuteneſs from a common fundamental 360; and deſcending towards gravity from a common acute term 180: which ſeries has this property, that taking the two extremes, and any other two at equal diſtances, the four will be in geometrical proportion.

The octave, by immediate diviſion, reſolves itſelf into a fourth and fifth; the fifth, again, by immediate diviſion, produces the two thirds; the two thirds are therefore found by diviſion; though not by immediate diviſion; and the ſame is true of the two ſixths. Thus do all the original concords ariſe out of the diviſion of the octave; the fifths and fourths immediately and directly, the thirds and ſixths mediately.

From the perfection of the octave ariſes this remarkable property, that it may be doubled, tripled, &c. and yet ſtill will preſerve a concord, *i. e.* the ſums of two or more octaves are concord; though the more compound will be gradually leſs agreeable: but it is not ſo with any other concord leſs than octave; the doubles, &c. of which are all diſcords.

Again, whatever ſound is concord to one extreme of the octave, is concord to the other alſo; and if we add any other ſimple concord to an octave, it agrees to both its extremes; to the neareſt extreme it is a ſimple concord, and to the fartheſt a compound one.

Another thing obſervable in this ſyſtem of concords is, that the greateſt number of vibrations of the fundamenta cannot exceed five; or that there is no concord where the fundamental makes more than five vibrations, to one coincidence with the acute term. It may be added, that this progreſs of the concords may be carried on to greater degrees of compoſition, even *in infinitum;* but ſtill the more compound, the leſs agreeable.

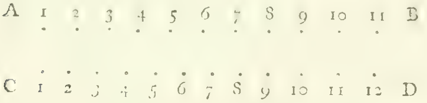
So a ſingle octave is better than a double one, and that than a triple one; and ſo of fifths, and other concords.

Three or four octaves form the extremes of all the intermediate ſounds; what will afford all the variety of pleaſure the harmony of ſounds is capable of affording, or at leaſt that we can receive; for we can hardly raiſe ſounds beyond that compaſs, either by voice or inſtrument, that ſhall not offend the ear.

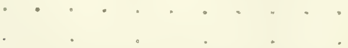
The phenomena attending ſimultaneous ſounds have been conſidered by Euler, and treated of in ſo clear and perſpicuous

cuous a manner, that we cannot do better than uſe his own words in this place.

"On hearing a ſimple muſical ſound, our ear is ſtruck with a ſeries of pulſations equally diſtant from each other, the frequency and number of which, in a given ſpace of time, conſtitute the difference which ſubſiſts between low notes and high; ſo that, the ſmaller the number of vibrations or ſtrokes produced in a given time, ſay a ſecond, the lower we eſtimate that note; and the greater the number of ſuch vibrations, the higher is the note. The perception of a ſimple muſical ſound may, therefore, be compared to a ſeries of dots equidiſtant from each other, as . . . . If the intervals between theſe dots be greater or ſmaller, the ſound produced will be lower or higher. It cannot be doubted, that the perception of a ſimple ſound is ſomewhat ſimilar, or analogous, to the ſight of ſuch a ſeries of dots equidiſtant from each other: we are enabled thus to repreſent to the eye, what the ear perceives on hearing ſound. If the diſtances between the dots were not equal, or theſe dots were ſcattered about confuſedly, they would be a repreſentation of a confuſed noiſe, inconſiſtent with harmony. This being laid down, let us conſider what effect two ſounds, emitted at once, muſt produce on the ear. Firſt, it is evident, that if two ſounds are equal, or if each performs the ſame number of vibrations in the ſame time, the ear will be affected in the very ſame manner as by a ſingle note; and, in muſic, theſe two notes are ſaid to be in uniſon, which is the ſimpleſt union or combination of two ſounds: we mean by the term the blending of two or more ſounds heard at once. But if two ſounds differ in reſpect of low and high, we ſhall perceive a mixture of two ſeries of pulſations, in each of which the intervals are equal among themſelves, but greater in the one than in the other; the greater intervals correſponding to the lower note, and the ſmaller to the higher. This mixture, or this combination of two notes, may be repreſented to the eyes by two ſeries of dots, arranged on two lines, A B, and C D;



and in order to form a juſt idea of theſe two ſeries, we muſt have a clear perception of the order which ſubſiſts among them, or, in other words, of the relation between the intervals of the one line and of the other. Having numbered and marked the dots of each line, and placed N° 1 under N° 1; thoſe marked with the figure 2, will not exactly correſpond, and ſtill leſs thoſe marked 3; but we find N° 11 exactly over N° 12; from which we diſcover that the higher note makes twelve vibrations, and the other only 11. If we had not affixed the figures, the eye would hardly have perceived this order; it is the ſame with the ear, which would with much difficulty have traced it in the two notes, which are repreſented by two rows of dots. But in the following figure,



you diſcover at the firſt glance, that the upper line contains twice as many dots as the under, or that the intervals in the under are twice as great as thoſe of the upper. This is undoubtedly, next to uniſon, the ſimpleſt of all caſes, in which you can at once diſcover the order which ſubſiſts between theſe two ſeries of dots; and the ſame thing holds with reſpect to the two notes repreſented by theſe two lines of dots: the number of vibrations contained in the one, will be preciſely the double of the vibrations contained in the other, and the ear will eaſily perceive the pleaſing relation of theſe two ſounds; whereas, in the preceding caſe, it was extremely difficult, if not impoſſible, to diſcriminate. When the ear readily diſcovers the relation ſubſiſting between two notes, their combination is denominated conſonance; and if it be very difficult, or even impoſſible, to catch this relation, the combination is termed diſſonance. The ſimpleſt conſonance, then, is that in which the high note produces preciſely twice as many vibrations as the low note. This conſonance, in the language of muſic, is called octave; every one knows what it means; and two notes which differ preciſely in octave, harmonize ſo perfectly, and poſſeſs ſuch a complete reſemblance, that muſicians mark them by the ſame letters." Euler's Letters, vol. i.

Let the ſeries of equal parts contained in the parallel right lines 01, 02, 03, &c., *fig. a*, *Muſic-Plate*, repreſent the ſeries of equal times between the ſucceſſive pulſes of air that beat on the ear, when the ſingle ſounds 01, 02, 03, &c. are heard reſpectively; then, when any two of theſe ſounds are heard together, the combination of the two correſponding lines, will rightly repreſent the two ſeries of equal times, if the magnitude of the equal parts in one line be to the magnitude of thoſe in the other, in the ratio of the ſingle vibrations of the ſounds; or, the whole lines being ſuppoſed equal, if the number of aliquot parts in each be ſeverally the ſame, as the leaſt numbers of the vibrations of each ſound, made in the ſame time. And the points which divide the ſeparate lines, will ſubdivide the combined lines into ſmaller portions, as in *fig. b*, where $0\frac{2}{3}$ repreſents a third ſeries, or cycle of times, in which the pulſes of the ſounds 02 and 03 interchangeably ſucceed each other in beating upon the ear; in like manner $0\frac{3}{4}$ and $0\frac{3}{5}$ will repreſent the cycles reſpectively produced, by the union of the ſounds 03 and 04, in the firſt caſe, and 03 and 05 in the ſecond caſe. See CYCLE.

According to Dr. Smith, (Harmonics, p. 15.) ſuch a mixture of pulſes, ſucceeding one another in a given cycle of times, terminated at both ends by coincident pulſes, and ſufficiently repeated, is the phyſical cauſe that excites the ſenſation of a given conſonance or concord: eſpecially when conſidered as diſtinct from any other conſonance, whoſe ſingle vibrations having a different ratio from that of the former, will conſtitute a different cycle, and excite a different ſenſation. And although the abſolute times may be different, yet if the ratio is the ſame, the conſonances are ſimilar, and may be looked upon as the ſame in this reſpect, that their cycles have the ſame form; the times in both having the ſame order, and the ſame proportions. And that this form of the cycles ſerves to excite the ſenſation of a particular concord, is evident, from conſidering, that if the agreeable ſenſation of conſonances, according to the received principle in harmonics, be the reſult of the frequent coincidences of their pulſes, and conſequently be more or leſs agreeable, according as the coincidences are more or leſs frequent; all the conſonances in tempered ſyſtems, whoſe vibrations are incommenſurable, ought to be the greateſt diſcords in nature; it being impoſſible for their pulſes to coincide more than once in an infinite time. For as no two numbers, how large ſoever, can expreſs the ratio of ſuch vibrations, ſo no multiple of one vibration can ever be equal to any multiple of the other. And yet experience ſhews that ſuch conſonances are much more agreeable than perfect diſcords, whoſe pulſes coincide very often.

We may, indeed, ſays Dr. Smith (p. 99.) approach as near as we pleaſe; and certainly much nearer than the ſenſe can diſtinguiſh, towards the exact magnitude of an incommenſurable ratio, by the ratios of whole numbers; but as theſe will grow larger and larger without bounds, ſo will the time between the ſucceſſive coincidences, or the length of the approximating cycle of the pulſes; by which is meant the time of either of the incommenſurable vibrations, multiplied by the heterologous term of the approximating ratio. Let any man tell us then where we may ſtop, and which of thoſe cycles it is, whoſe repetition excites the determinate ſenſation of the conſonance.

The like difficulty occurs in approaching gradually even to a commenſurable ratio of the vibrations of any perfect conſonance. For, if either of its vibrations be pretty much altered at once, and then be made to approach by degrees to its former length, the terms of the ſeveral approximating ratios will grow larger and larger without bounds, and in regular order, except when ratios occur whoſe terms are reducible; and the cycles of their pulſes will accordingly be longer and longer, and their coincidences fewer without limit, thoſe interruptions excepted; and yet the conſonance will grow better and better by regular degrees, till it arrives at perfection, as is certain by experience. For inſtance, the ratios 30 to 21, 300 to 201, 3000 to 2001, &c. approach nearer and nearer to 3 to 2, and the Vths, whoſe vibrations are in thoſe ratios, grow more and more harmonious, though the cycles of their pulſes grow longer and longer to infinity.

It ſeems indiſputable, that coincident pulſes are not neceſſary to ſuch harmony as the ear judges to be perfect. For if any long period of imperfect uniſons, intercepted between two beats, be lengthened greatly and indeterminately, as in tuning an inſtrument, any given part of it, as long as any muſical note, will approach indefinitely near to perfect uniſons; certainly nearer than the ear can diſtinguiſh, as being often doubtful of their perfection. And yet throughout that part (ſuppoſed to be ſmall in compariſon to the whole period) the pulſes of one ſound divide the intervals of the pulſes of the other very nearly in a given ratio, of any determinate magnitude, between infinitely great and infinitely ſmall, in proportion to the diſtance of that part from the periodical point or point of coincidence. Nevertheleſs, the ear cannot diſtinguiſh any difference in the harmony of ſuch different parts, as is evident by often repeating the ſame conſonance, which can hardly begin conſtantly in the ſame place of the long period; and this argument applies to all other conſonances beſides uniſons.

Dr. Robiſon ſupports this train of argument, by a reference to the well known fact, that if two muſical inſtruments, as two organ pipes, tuned ſo exactly in uniſon that their pulſes may be ſuppoſed to begin and end at the ſame inſtants, making the moſt perfect coincidence of pulſes, be placed at a given diſtance from each other, and ſounded, the conſonance will be perfectly the ſame, in whatever part of the room or ſpace round the ſounding pipes the ear of an auditor may be placed; while, owing to the time taken up by ſound in travelling through a given ſpace, it is evident that the ſuppoſed coincidence of the pulſes in the ſounds cannot ſo affect or reach an ear unleſs it be placed exactly at equal diſtances from each of the ſounds; whereas, by placing himſelf exactly in the middle of the right line joining two uniſon ſounds, and gradually approaching one of the ſounds, every poſſible diſlocation or deviation of the pulſes from coincidence will prevail, in their action upon one of the ears of an obſerver, while in moſt caſes the other ear will be very differently affected upon, owing to its relative diſtances from the ſounding bodies being different. And hence, as Dr. Robiſon concludes, "a muſical ſound is the ſenſation of a certain form of the aerial undulation which agitates the auditory organ. The perception of harmonious ſound is the ſenſation produced by another definite form of the agitation. This is the compoſition of two other agitations; but it is the compound agitation only that affects the ear, and it is its form or kind which determines the ſenſation, making it pleaſant or unpleaſant," or in other words, a concord or a diſcord.

On the ſuppoſition that nature has appointed no certain limits between concords and diſcords, Dr. Smith (Harmon. p. 15.) inquires into the order of ſimplicity of the conſonances between different ſounds, perfectly adjuſted according to their ratios, on the principle, that one conſonance may be conſidered as more or leſs ſimple than another, according as the cycle of times belonging to it is more or leſs ſimple than the cycle belonging to the other, or, as the ſum of the leaſt terms expreſſing the ratio of the ſingle vibrations is ſmaller than the like ſum in the other conſonance; and that, when ſeveral ſuch ſums are the ſame, theſe conſonances are ſimpler in the ſame order as the leſſer terms of their ratios are ſmaller; and he diſpoſes the conſonances in a table, differing little, except in arrangement of the columns, from the following:

Order of the Simplicity.	Ratios of the vibrations.	Concords.	Order of the Simplicity.	Ratios of the vibrations.	Concords.
1	1 : 1	Uniſon.	16	1 : 16	XXIX
2	1 : 2	VIII	$16\frac{1}{8}$	2 : 15	
3	1 : 3	XII	$16\frac{1}{5}$	5 : 12	10th
4	1 : 4	XV	$16\frac{7}{8}$	8 : 9	
$4\frac{1}{2}$	2 : 3	V	17	1 : 17 *	
5	1 : 5	XVII	18	1 : 18	
6	1 : 6	XIX	$18\frac{2}{9}$	3 : 16	18th
$6\frac{1}{3}$	2 : 5	X	$18\frac{1}{4}$	4 : 15	
$6\frac{2}{3}$	3 : 4	4th	$18\frac{8}{9}$	9 : 10	
7	1 : 7 *		19	1 : 19	
$7\frac{2}{3}$	3 : 5	VI	20	1 : 20	XXXI
8	1 : 8	XXII	$20\frac{2}{5}$	5 : 16	13th
$8\frac{3}{4}$	4 : 5	III	22	1 : 22 *	
9	1 : 9		$22\frac{2}{11}$	3 : 20	XX
10	1 : 10	XXIV	$22\frac{4}{11}$	5 : 18	
$10\frac{1}{5}$	2 : 9		$22\frac{7}{11}$	8 : 15	
$10\frac{2}{5}$	3 : 8	11th	24	1 : 24	XXXIII
$10\frac{4}{5}$	5 : 6	3d	$24\frac{2}{3}$	9 : 16	
11	1 : 11 *		28	1 : 28 *	
12	1 : 12	XXVI	$28\frac{2}{7}$	5 : 24	17th
$12\frac{1}{3}$	3 : 10	XIII	$28\frac{4}{7}$	9 : 20	
$12\frac{2}{3}$	5 : 8	6th	30	1 : 30	
$12\frac{5}{6}$	6 : 7 *		$30\frac{14}{15}$	15 : 16	
13	1 : 13 *		$76\frac{31}{33}$	32 : 45	
14	1 : 14 *		$108\frac{22}{27}$	45 : 64	
15	1 : 15				

The firſt and ſecond columns of this table can ſcarcely need any explanation; the third contains the concords, major and minor, expreſſed as in the ſecond column of the general table of concords, which follows in this article: the blanks in this column denote the diſcords, ſuch as are marked with a * being compoſed of primes larger than 5, as 7, 11, 13, &c. and have no exiſtence in muſic, except in the falſe notes of the TRUMPET, HORN, &c.; ſee thoſe articles: the others, or their octaves, will be found in the table of DISCORDS; ſee that article.

On the other hand, Dr. Robiſon and other writers have maintained, and we think juſtly, that nature has not left the concords without other diſtinctions than the capricious and uncertain preference given to them by muſicians, but in addition to the almoſt univerſal delight which concords afford to every deſcription of auditors, that the phenomena of ſlow and audible beats, accompanying each concord, when ſlightly tempered either in exceſs or defect, ſufficiently diſtinguiſh ſuch from all other muſical intervals, compriſed properly under the denomination of diſcords, or imperfect concords; and we cannot but agree with Dr. R. in thinking, that the ſtudy of the principles of harmonics would be greatly facilitated by conſidering the concords as the elements or fundamental intervals of melody fixed by nature, and that we ſhould proceed to ſupply the other ſteps wanting in the ſcale, from their differences or combinations, rather than by aſſuming the tones and hemitones (which are diſcords that the moſt refined ear cannot accurately appreciate) to be the elements for compoſing the practical intervals of muſic; which it is not meant to contend, that they cannot accurately do in theory, but that concords of the truth or exact magnitude of which ordinary ears can at once judge with ſufficient exactneſs (while the curious can adjuſt ſuch in practice, by help of the beats, to any deſired degree of accuracy) are better adapted to the purpoſes of harmonical computations and reaſonings, and will admit of more direct and perhaps alſo of ſome new applications in practice.

For illuſtrating this ſubject, we beg to be allowed to mention an experiment by Dr. Robiſon, made with a wheel monochord, perhaps improperly ſo named, becauſe it had two ſtrings, which, by means of a reſined revolving wheel, could be made to yield clear and even ſounds for any required ſpace of time: one of the ſtrings giving conſtantly the ſame ſound, while the length of the other, after being accurately tuned in uniſon therewith, admitted of being ſhortened in any required degree, without altering its tone.

Beginning with the uniſon (but which was not exactly the order in the Doctor's experiment), the moveable bridge, which determined the length of the variable ſtring, was ſlowly and gradually moved forwards; at firſt a very ſlow, and by degrees a quicker, beating of the imperfect uniſon was heard, which increaſed in rapidity until the beats could no longer be counted, and at length they became a violent rattling flutter, which degenerated into a diſagreeable jar. Still advancing the bridge, vile diſcordant noiſes reſulted from the ſound of the two ſtrings, until the variable ſtring had been ſhortened nearly $\frac{1}{10}$, or when a little more than $\frac{9}{10}$ of the ſtring continued to ſound; when a very rapid angry flutter commenced, that became rather leſs rapid and offenſive as the point $\frac{9}{10}$ was approached, and again increaſed after that, until the diſcordant jar prevailed again; and this continued, until $\frac{8}{9}$ of the ſtring was approached, when a ſimilar flutter commenced, decreaſed, and again increaſed as this point was paſſed by the bridge; the jar beginning again, and accompanying the motion of the bridge, until it almoſt arrived at $\frac{5}{6}$ths of the ſtring's length, when a flutter and rapid beat commenced, decreaſing in frequency, until at $\frac{5}{6}$, or when the minor third (3^{d}) was ſounded, they ceaſed entirely, and the reſult was a concord rather agreeable than otherwiſe, but ſtrongly marked by a mournful melancholy in the expreſſion; which, being ſufficiently noticed, the bridge was again advanced, and produced the ſame beating, ſlow at firſt, then quicker, and at length fluttering, until the like grating diſſonance ſucceeded as before. This continued, until near the point marked $\frac{4}{5}$, when the beatings again commenced, having a peeviſh fretful expreſſion as they decreaſed in quickneſs, owing to the advance of the bridge, to the point of the major third (III), when the beats ceaſed, and the peculiarly enlivening and gay character of this concord was experienced by the hearers, who noticed an angry and waſpiſh expreſſion to accompany the ſucceeding beats as the ſtring ſhortened, but which gave place gradually to the ſame flutter and jar as before.

When little more than $\frac{3}{4}$ths of the ſtring's length continued to ſound, the flutterings and rapid beats were again heard, and the latter decreaſed and ceaſed entirely, at the point marking the fourth (4^{th}) which was noticed as a ſoft and agreeable concord. To this firſt ſlow, and then rapid, beats ſucceeded, and rapid flutterings, and a jarring noiſe. Near $\frac{32}{45}$ths of the ſtring the fluttering commenced again, and decreaſed until about ſix of them could be counted in a ſecond of time as the falſe IV was paſſed, after which they increaſed again in rapidity as the bridge advanced, and an indiſtinct and jarring noiſe ſucceeded, which ſoon again became a flutter that decreaſed until at $\frac{45}{64}$ths of the ſtring about eight of theſe angry flutters could be counted in a ſecond, correſponding to the falſe fifth, after which they increaſed in rapidity, and the jarring noiſe was again heard.

The bridge being progreſſively moved, the flutterings began, beats ſucceeded, and paſſed into a gentle and not unpleaſant undulation which ceaſed entirely at $\frac{2}{3}$ds of the ſtring, when the fifth (V) with the cheering ſweetneſs which characterizes it, was heard in the accordance of the two ſounds, neither of which could be ſeparately diſtinguiſhed: after which the ſlow and rapid beats, and fluttering, and jar ſucceeded as before. Some time before the bridge reached the mark for $\frac{5}{8}$ths of the ſtring the flutter and beats began again, and at that point the minor ſixth (6^{th}) a conſonance in a ſlight degree pleaſant was heard of a mournful character, without any beatings, but which were heard to recommence and increaſe as the bridge advanced; and the jarring diſſonance contiuued, until little more than $\frac{3}{5}$ths of the variable ſtring was left ſounding, when flutters and beats ſucceeded, and ſuch ceaſed when the true major ſixth (VI) was heard, the character of which it was found difficult to expreſs, otherwiſe than as being greatly inferior to the V in ſweetneſs, and to the III in gaiety, but poſſeſſing in a lower degree both of theſe qualities: ſhifting the bridge forwards, beats, flutters, and diſcordant noiſes ſucceeded, attended with two perceptible changes to flutters, in its progreſs towards the $\frac{1}{2}$ of the ſtring; which was not reached without the violent flutters, rapid and ſlower beats, ſo often before deſcribed; but when the beatings ceaſed the true octave (VIII) was heard, the treble note being with difficulty diſtinguiſhed from the baſs or fundamental afforded by the other ſtring, and not at all ſo if the notes were duly apportioned in loudneſs. After this, if the bridge was ſtill further advanced, beats, flutters, &c. ſucceeded as before, anſwering to the octaves of the ſounds already deſcribed, as the bridge advanced to make half of the lengths of the former ſtrings, reſpectively.

The doctor concludes his account of this very intereſting experiment by remarking, that he has perhaps been raſh in affixing certain moral or ſentimental characters to certain concords; becauſe he had ſeen inſtances of perſons who gave them different denominations, but theſe were never contradictory to his, but always expreſſed ſome ſentiment allied to thoſe above aſſigned. A perſon capable of a little diſcriminating reflection was never met with by the doctor, who did not acknowledge a manifeſt ſentimental diſtinction among the different concords, which could not be confounded. Speaking in another place on this ſubject, the doctor remarks, that he had made numberleſs trials of the different concords with perſons altogether ignorant of muſic; none of all thus examined had much pleaſure from an octave; all without exception, were delighted with a fifth, and with a major third, and many of them preferred the latter. All of them agreed in calling the pleaſure from the fifth a ſweetneſs, and that from the major third a cheerfulneſs or ſmartneſs, or by names of ſimilar import. The greater part preferred even the major ſixth to the fourth, and ſome felt no pleaſure at all from the fourth. Few had much pleaſure from the minor third or minor ſixth. Care was in the above inſtances taken, to ſound theſe concords without any preparation, merely as ſounds, not as making part of any muſical paſſage, circumſtances which have great effect on the mind. When the minor third and ſixth were heard as making part of the minor mode, all were delighted with them, and called them ſweet and mournful. In like manner the chord $^{6}_{4}$ never failed to give pleaſure. Dr. Smith (Harmonics, p. 21.) ſeemed to think that the concords within the octave would be found to affect the ear with ſmoother and pleaſanter ſenſations in the following order: *viz.* VIII, V, 4th, VI, III, 3^{d}, 6th, the laſt being the leaſt harmonious; but this concluſion he ſeemed to have formed from the numerical ſimplicity of their ratios as expreſſed in his Table above, rather than from a ſeries of experiments on their effects: but it is plain that this cannot expreſs the order of harmoniouſneſs, becauſe four diſcords will be found to intervene among the ſeven concords above, two of which alſo include the primes 7 and 11, which excludes them from our ſcale of muſic.

It will appear from the above, that each of the ſeven concords has a natural foundation and place in the ſcale of melody, but perhaps they will not all be found equally fit to be conſidered as elements in compoſing the ſcale. Reſpecting which, it may be right here to obſerve, that no general and ſtrictly accurate method of notation, for compoſing or ſhewing the relations of muſical intervals, can have leſs than three terms (for logarithms are only an approximation to their ratios, depending on the number of places of figures uſed) whether theſe are the muſical integers, 2, 3, and 5; the intervals T, *t*, and H; Σ, *f*, and *m*, or any other (Phil. Mag. xxvii. 195, and xxviii. 140). The comparative perfection of the harmony of the VIII, V, and 4th, the facility with which they can be tuned by the ear, and the ſimplicity of their ratios $\frac{1}{2}$, $\frac{2}{3}$, and $\frac{3}{4}$, might ſeem to point them out as the moſt eligible, for concordant elements of the ſcale, but conſiderable experience in theſe kinds of calculations and inquiries has led us to prefer the three ſmalleſt concords, or 4th, III, and 3^{d} for this purpoſe; (ſee *Common* CHORD,) becauſe ſubſtraction of the ratios is thereby moſt avoided, at the ſame time that the larger concords can by inſpection be formed, out of theſe, in moſt inſtances. The following Table has been calculated and arranged with conſiderable care and trouble, and it will, we hope, prove uſeful to our muſical readers in ſaving much of their time when purſuing theſe curious and uſeful ſpeculations.

A TABLE of the Relations which the ſeveral Concords bear to the Key-Note, within the Compaſs of Seven Octaves.

1	2	3	4	5	6	7
84	L	c^{6}	$\frac{1}{128}$	7.8927900,3	$\frac{1}{2.2.2.2.2.2.2}$	${}^{7}4+{}^{7}\mathrm{III}+{}^{7}3,\ {}^{7}\mathrm{VIII},\ {}^{7}\mathrm{VI}+{}^{7}3,\ {}^{7}6+{}^{7}\mathrm{III},\ {}^{7}\mathrm{V}+{}^{7}4$
81	XLVIII	a^{5}	$\frac{3}{320}$	7.9719712,7	$\frac{3}{2.2.2.2.2.2.5}$	${}^{7}4+{}^{7}\mathrm{III}+{}^{6}3,\ {}^{6}\mathrm{VIII}+\mathrm{VI},\ {}^{7}\mathrm{VI}+{}^{6}3,\ {}^{6}6+4+{}^{7}\mathrm{III},\ {}^{6}\mathrm{V}+{}^{7}4+\mathrm{III}$
80	48th	ba^{5}	$\frac{5}{512}$	7.9897000,4	$\frac{5}{2.2.2.2.2.2.2.2.2}$	${}^{7}4+{}^{6}\mathrm{III}+{}^{7}3,\ {}^{6}\mathrm{VIII}+6,\ {}^{7}6+{}^{6}\mathrm{III},\ {}^{6}\mathrm{VI}+4+{}^{7}3,\ {}^{6}\mathrm{V}+{}^{7}4+3$
79	XLVII	g^{5}	$\frac{1}{96}$	8.0177287,7	$\frac{1}{2.2.2.2.2.3}$	${}^{6}4+{}^{7}\mathrm{III}+{}^{7}3,\ {}^{6}\mathrm{VIII}+\mathrm{V},\ {}^{7}\mathrm{V}+{}^{6}4,\ {}^{6}\mathrm{VI}+\mathrm{V}+{}^{6}3,\ {}^{6}\mathrm{VI}+\mathrm{III}+{}^{7}3$
77	46th	f^{5}	$\frac{3}{256}$	8.0688812,8	$\frac{3}{2.2.2.2.2.2.2.2}$	${}^{7}4+{}^{6}\mathrm{III}+{}^{6}3,\ {}^{6}\mathrm{VIII}+4,\ {}^{6}\mathrm{V}+{}^{7}4,\ {}^{6}\mathrm{VI}+4+{}^{6}3,\ {}^{6}6+4+{}^{6}\mathrm{III}$
76	XLV	e^{5}	$\frac{1}{80}$	8.0969100,1	$\frac{1}{2.2.2.2.5}$	${}^{6}4+{}^{7}\mathrm{III}+{}^{6}3,\ {}^{6}\mathrm{VIII}+\mathrm{III},\ {}^{6}6+{}^{7}\mathrm{III},\ \mathrm{VI}+{}^{6}\mathrm{V}+{}^{5}4,\ {}^{6}\mathrm{VI}+\mathrm{V}+{}^{5}3$
75	45th	be^{5}	$\frac{5}{384}$	8.1146387,8	$\frac{5}{2.2.2.2.2.2.2.3}$	${}^{6}4+{}^{6}\mathrm{III}+{}^{7}3,\ {}^{6}\mathrm{VIII}+3,\ {}^{6}\mathrm{VI}+{}^{7}3,\ 6+{}^{6}\mathrm{V}+{}^{5}4,\ {}^{6}6+\mathrm{V}+{}^{5}\mathrm{III}$
72	XLIII	c^{5}	$\frac{1}{64}$	8.1938200,3	$\frac{1}{2.2.2.2.2.2}$	${}^{6}4+{}^{6}\mathrm{III}+{}^{6}3,\ {}^{6}\mathrm{VIII}\ \ {}^{6}\mathrm{VI}+{}^{6}3,\ {}^{6}6+{}^{6}\mathrm{III},\ {}^{6}\mathrm{V}+{}^{6}4$
69	XLI	a^{4}	$\frac{3}{160}$	8.2730012,7	$\frac{3}{2.2.2.2.2.5}$	${}^{6}4+{}^{6}\mathrm{III}+{}^{5}3,\ {}^{5}\mathrm{VIII}+\mathrm{VI},\ {}^{6}\mathrm{VI}+{}^{5}3,\ {}^{5}6+4+{}^{6}\mathrm{III},\ {}^{5}\mathrm{V}+{}^{6}4+\mathrm{III}$
68	41ſt	ba^{4}	$\frac{5}{256}$	8.2907300,3	$\frac{5}{2.2.2.2.2.2.2.2}$	${}^{6}4+{}^{5}\mathrm{III}+{}^{6}3,\ {}^{5}\mathrm{VIII}+6,\ {}^{6}6+{}^{5}\mathrm{III},\ {}^{5}\mathrm{VI}+4+{}^{6}3,\ {}^{5}\mathrm{V}+{}^{6}4+3$
67	XL	g^{4}	$\frac{1}{48}$	8.3187587,6	$\frac{1}{2.2.2.2.3}$	${}^{5}4+{}^{6}\mathrm{III}+{}^{6}3,\ {}^{5}\mathrm{VIII}+\mathrm{V},\ {}^{6}\mathrm{V}+{}^{5}4,\ {}^{5}\mathrm{VI}+\mathrm{V}+{}^{5}3,\ {}^{5}\mathrm{VI}+\mathrm{III}+{}^{6}3$
65	39th	f^{4}	$\frac{3}{128}$	8.3699112,8	$\frac{3}{2.2.2.2.2.2.2}$	${}^{6}4+{}^{5}\mathrm{III}+{}^{5}3,\ {}^{5}\mathrm{VIII}+4,\ {}^{5}\mathrm{V}+{}^{6}4,\ {}^{5}\mathrm{VI}+4+{}^{5}3,\ {}^{5}6+4+{}^{5}\mathrm{III}$
64	XXXVIII	e^{4}	$\frac{1}{40}$	8.3979400,1	$\frac{1}{2.2.2.5}$	${}^{5}4+{}^{6}\mathrm{III}+{}^{5}3,\ {}^{5}\mathrm{VIII}+\mathrm{III},\ {}^{5}6+{}^{6}\mathrm{III},\ \mathrm{VI}+{}^{5}\mathrm{V}+{}^{4}4,\ {}^{6}\mathrm{VI}+\mathrm{V}+{}^{4}3$
63	58th	be^{4}	$\frac{5}{192}$	8.4156687,7	$\frac{5}{2.2.2.2.2.2.3}$	${}^{5}4+{}^{5}\mathrm{III}+{}^{6}3,\ {}^{5}\mathrm{VIII}+3,\ {}^{5}\mathrm{VI}+{}^{6}3,\ 6+{}^{5}\mathrm{V}+{}^{4}4,\ {}^{5}6+\mathrm{V}+{}^{4}\mathrm{III}$
60	XXXVI	c^{4}	$\frac{1}{32}$	8.4948500,2	$\frac{1}{2.2.2.2.2}$	${}^{5}4+{}^{5}\mathrm{III}+{}^{5}3,\ {}^{5}\mathrm{VIII},\ {}^{5}\mathrm{VI}+{}^{5}3,\ {}^{5}6+{}^{5}\mathrm{III},\ {}^{5}\mathrm{V}+{}^{5}4$
57	XXXIV	a'''	$\frac{3}{80}$	8.5740312,6	$\frac{3}{2.2.2.2.2}$	${}^{5}4+{}^{5}\mathrm{III}+{}^{4}3,\ {}^{4}\mathrm{VIII}+\mathrm{VI},\ {}^{5}\mathrm{VI}+{}^{4}3,\ {}^{4}6+4+{}^{5}\mathrm{III},\ {}^{4}\mathrm{V}+{}^{5}4+\mathrm{III}$
56	34th	ba'''	$\frac{5}{128}$	8.5917600,3	$\frac{5}{2.2.2.2.2.2.2}$	${}^{5}4+{}^{4}\mathrm{III}+{}^{5}3,\ {}^{4}\mathrm{VIII}+6,\ {}^{5}6+{}^{4}\mathrm{III},\ {}^{4}\mathrm{VI}+4+{}^{5}3,\ {}^{4}\mathrm{V}+{}^{5}4+3$
55	XXXIII	g'''	$\frac{1}{24}$	8.6197887,6	$\frac{1}{2.2.2.3}$	${}^{4}4+{}^{5}\mathrm{III}+{}^{5}3,\ {}^{4}\mathrm{VIII}+\mathrm{V},\ {}^{5}\mathrm{V}+{}^{4}4,\ {}^{4}\mathrm{VI}+\mathrm{V}+{}^{4}3,\ {}^{4}\mathrm{VI}+\mathrm{III}+{}^{5}3$
53	32d	f'''	$\frac{3}{64}$	8.6709412,8	$\frac{3}{2.2.2.2.2.2}$	${}^{5}4+{}^{4}\mathrm{III}+{}^{4}3,\ {}^{4}\mathrm{VIII}+4,\ {}^{4}\mathrm{V}+{}^{5}4,\ {}^{4}\mathrm{VI}+4+{}^{4}3,\ {}^{4}6+4+{}^{4}\mathrm{III}$
52	XXXI	e'''	$\frac{1}{20}$	8.6989699,9	$\frac{1}{2.2.5}$	${}^{4}4+{}^{5}\mathrm{III}+{}^{4}3,\ {}^{4}\mathrm{VIII}+\mathrm{III},\ {}^{4}6+{}^{5}\mathrm{III},\ \mathrm{VI}+{}^{4}\mathrm{V}+{}^{3}4,\ {}^{4}\mathrm{VI}+\mathrm{V}+{}^{3}3$
51	31ſt	be'''	$\frac{5}{96}$	8.7166987,7	$\frac{5}{2.2.2.2.2.3}$	${}^{4}4+{}^{4}\mathrm{III}+{}^{5}3,\ {}^{4}\mathrm{VIII}+3,\ {}^{4}\mathrm{VI}+{}^{5}3,\ 6+{}^{4}\mathrm{V}+{}^{3}4,\ {}^{4}6+\mathrm{V}+{}^{3}\mathrm{III}$
[illegible]	Intervals, Major and Minor.	Letters.	Ratios.	Common Logarithms.	Ratios in their Component Primes.	Tuneable Intervals.

A TABLE of the Relations which the ſeveral Concords bear to the Key-Note, within the Compaſs of Seven Octaves.

1	2	3	4	5	6	7				
48	XXIX	*c*‴	$\frac{1}{16}$	8.7958800,2	$\frac{1}{2.2.2.4}$	^{4}4 + ^{4}III + ^{4}3,	^{4}VIII,	^{4}VI + ^{4}3,	^{4}6 + III,	^{4}V + ^{4}4
45	XXVII	*a*″	$\frac{3}{40}$	8.8750612,6	$\frac{3}{2.2.2.5}$	^{4}4 + ^{4}III + ^{3}3,	^{3}VIII + VI,	^{4}VI + ^{3}3,	^{3}6 + 4 + ^{4}III,	^{3}V + ^{4}4 + III
44	27th	b*a*″	$\frac{5}{64}$	8.8927900,3	$\frac{5}{2.2.2.2.2.2}$	^{4}4 + ^{3}III + ^{4}3,	^{3}VIII + 6,	^{4}6 + ^{3}III,	^{3}VI + 4 + ^{4}3,	^{3}V + ^{4}4 + 3
43	XXVI	*g*″	$\frac{1}{12}$	8.9208187,5	$\frac{1}{2.2.3}$	^{3}4 + ^{4}III + ^{4}3,	^{3}VIII + V,	^{4}V + ^{3}4,	^{3}VI + V + ^{3}3,	^{3}VI + III + ^{4}3
41	25th	*f*″	$\frac{3}{32}$	8.9719712,7	$\frac{3}{2.2.2.2.2}$	^{4}4 + ^{3}III + ^{3}3,	^{3}VIII + 4,	^{3}V + ^{4}4,	^{3}VI + 4 + ^{3}3,	^{3}6 + 4 + ^{3}III
40	XXIV	*e*″	$\frac{1}{10}$	9.0000000,0	$\frac{1}{2.5}$	^{3}4 + ^{4}III + ^{3}3,	^{3}VIII + III,	^{3}6 + ^{4}III,	VI + ^{3}V + ^{2}4,	^{3}VI + V + ^{2}3
39	24th	b*e*″	$\frac{5}{48}$	9.0177287,6	$\frac{5}{2.2.2.2.3}$	^{4}4 + ^{3}III + ^{4}3,	^{3}VIII + 3,	^{3}VI + ^{4}3,	6 + ^{3}V + ^{2}4,	^{3}6 + V + ^{2}III
36	XXII	*c*″	$\frac{1}{8}$	9.0969100,1	$\frac{1}{2.2.2}$	^{3}4 + ^{3}III + ^{3}3,	^{3}VIII,	^{3}VI + ^{3}3,	^{3}6 + ^{3}III,	^{3}V + ^{3}4
33	XX	*a*′	$\frac{3}{20}$	9.1760912,5	$\frac{3}{2.2.5}$	^{3}4 + ^{3}III + ^{2}3,	^{2}VIII + VI,	^{3}VI + ^{2}3,	^{2}6 + 4 + ^{3}III,	^{2}V + ^{3}4 + III
32	20th	b*a*′	$\frac{5}{32}$	9.1938200,2	$\frac{5}{2.2.2.2.2}$	^{3}4 + ^{2}III + ^{3}3,	^{2}VIII + 6,	^{3}6 + ^{2}III,	^{2}VI + 4 + ^{3}3,	^{2}V + ^{3}4 + 3
31	XIX	*g*′	$\frac{1}{6}$	9.2218487,5	$\frac{1}{2.3}$	^{2}4 + ^{3}III + ^{3}3,	^{2}VIII + V,	^{3}V + ^{2}4,	^{3}VI + V + ^{2}3,	^{2}VI + III + ^{3}3
29	18th	*f*′	$\frac{3}{16}$	9.2730012,7	$\frac{3}{2.2.2.2}$	^{3}4 + ^{2}III + ^{2}3,	^{2}VIII + 4,	^{2}V + ^{3}4,	^{2}VI + 4 + ^{2}3,	^{2}6 + 4 + ^{2}III
28	XVII	*e*′	$\frac{1}{5}$	9.3010299.9	$\frac{1}{5}$	^{2}4 + ^{3}III + ^{2}3,	^{2}VIII + III,	^{2}6 + ^{3}III,	VI + ^{2}V + 4,	^{2}VI + V + 3
27	17th	b*e*′	$\frac{5}{24}$	9.3187587,8	$\frac{5}{2.2.2.3}$	^{2}4 + ^{2}III + ^{3}3,	^{2}VIII + 3,	^{2}VI + ^{3}3,	6 + ^{2}V + 4,	^{2}6 + V + III
24	XV	*c*′	$\frac{1}{4}$	9.3979400,1	$\frac{1}{2.2}$	^{2}4 + ^{2}III + ^{2}3,	^{2}VIII,	^{2}VI + ^{2}3,	^{2}6 + ^{2}III,	^{2}V + ^{2}4
21	XIII	*a*	$\frac{3}{10}$	9.4771212.5	$\frac{3}{2.5}$	^{2}4 + ^{2}III + 3,	VIII + VI,	^{2}VI + 3,	6 + 4 + ^{2}III,	V + ^{2}4 + III
20	13th	b*a*	$\frac{5}{16}$	9.4948500,2	$\frac{5}{2.2.2.2}$	^{2}4 + III + ^{2}3,	VIII + 6,	^{2}6 + III,	VI + 4 + ^{2}3,	V + ^{2}4 + 3
19	XII	*g*	$\frac{1}{3}$	9,5228787,5	$\frac{1}{3}$	4 + ^{2}III + ^{2}3,	VIII + V,	^{2}V + 4,	VI + V + 3,	VI + III + ^{2}3
17	11th	*f*	$\frac{3}{8}$	9.5740312,6	$\frac{3}{2.2.2}$	^{2}4 + III + 3,	VIII + 4,	V + ^{2}4,	VI + 4 + 3,	6 + 4 + III
16	X	*e*	$\frac{2}{5}$	9.6020599.9	$\frac{2}{5}$	4 + ^{2}III + 3,	VIII + III,	6 + ^{2}III,	VI + V,	V + 4 + III
15	10th	b*e*	$\frac{5}{12}$	9.6197887,5	$\frac{5}{2.2.3}$	4 + III + ^{2}3,	VIII + 3,	VI + ^{2}3,	6 + V,	V + 4 + 3
12	VIII	*c*	$\frac{1}{2}$	9.6989699,9	$\frac{1}{2}$	4 + III + 3,	VIII,	VI + 3,	6 + III,	V + 4
9	VI	A	$\frac{3}{5}$	9.7781512,5	$\frac{3}{5}$	4 + III ,	VIII − 3,	VI		
8	6th	bA	$\frac{5}{8}$	9.8958800,1	$\frac{5}{2.2.2}$	4 + 3,	VIII − III,	6		
7	V	G	$\frac{2}{3}$	9.8239087,5	$\frac{2}{3}$	III + 3,	VIII − 4,	V,		
5	4th	F	$\frac{3}{4}$	9.8750612,6	$\frac{3}{2.2}$	4 ,	VIII − V,	4,	6 − 3,	
4	III	E	$\frac{4}{5}$	9.9030899,9	$\frac{2.2}{5}$	III ,	VIII − 6,	III,	V − 3,	
3	3d	bE	$\frac{5}{6}$	9.9208187,5	$\frac{5}{2.3}$	3,	VIII − VI,	3,	6 − 4,	
	Key	C	$\frac{1}{1}$	0.0000000,0	$\frac{1}{1}$	Uniſon				
	Intervals, Major and Mior.	Letters.	Ratios.	Common Logarithms.	Ratio in their Component Primes.	Tuneable Intervals.				

The titles of the columns are placed at the bottom of the foregoing Table, becauſe it is intended to be read from the bottom upwards, agreeably to the practice of muſicians, who read their notes upwards. Column 1 contains the number of finger-key intervals or half-notes: it will be found of uſe, in rough calculations reſpecting muſical intervals; thus, ſuppoſe a VI were to be added to a 6th, and it was required to know on what note the ſum would fall, we have 9 + 8 = 17, which anſwers in the Table to the 11th, and which happens to be exactly their ſum, as is evident by comparing column 7: ſuppoſe again, that it was required to know the interval anſwering to three IIIds, we have in this caſe 4 × 3 = 12; this in the Table anſwers to the VIII, but it is evident from col. 7, that this is only an approximate value, becauſe this is 4 + III + 3 inſtead of 3 III, the difference being an enharmonic dieſis, or the Tierce wolf of earl Stanhope.

Column 2 contains the marks of the intervals, the major intervals being denominated by Roman, and the minor intervals by Arabic characters, or numbers. Column 3 ſhews the notes of the gamut, diſtinguiſhing the ſeven different octaves, the firſt or loweſt by Roman capitals, the next by Italic ſmall letters, the third by theſe accented, the fourth by the ſame double accented, the fifth by three accents, and the ſixth and ſeventh octaves by ſmall figures or indices, to expreſs the number of accents.

Column 4 contains the ratios of the ſeveral notes, in their loweſt terms. Column 5 contains the common or Briggs's logarimths to eight places of figures, the laſt being ſeparated by a comma, in order to agree with the common tables, which have only ſeven places: whenever this number only is wanted, the ſeventh figure muſt be increaſed an unit, in every caſe where the eighth figure in the table exceeds 5.

Column 6 ſhews the ratios, expreſſed in their component primes, for the convenience of decompoſing the ſame into tuneable intervals, as explained in our article Comma; thus, the ſecond fraction, or $\frac{3}{2.2.2.2.2.2.5}$ may be divided or expreſſed by $\frac{1}{2}$, $\frac{1}{2}$, $\frac{1}{2}$, $\frac{1}{2}$, $\frac{1}{2}$, $\frac{1}{2}$, $\frac{3}{5}$ which ſhews it to be equivalent to 6 VIII + VI, as in column 7. The fraction anſwering to the 6th, or $\frac{5}{2.2.2}$ may be thus ſtated, *viz.* $\frac{1}{2}$, $\frac{5}{4}$, or VIII – III, the laſt term being negative, becauſe the ratio or fraction expreſſing it is found reverſed.

Column 7 contains ſeveral different values of each interval in col. 2, all expreſſed in tuneable intervals, or concords: the firſt, in each caſe, is expreſſed in the concordant elements, or ſmalleſt concords 4, III and 3d; the next expreſſion in each line has one or more VIIIths in its compoſition; we have next given thoſe tuneable intervals, which are found to expreſs each interval by two terms only; and have then added two others, (being all that our room would admit) of the various expreſſions in tuneable intervals, which can be had for any concord in col. 2, eſpecially if negative ſigns are admitted, as we have done in the loweſt octave of our table. Matter for curious reflection will preſent itſelf to the muſical ſtudent, who attentively conſiders the laſt column of our table, ſuch as; 1ſt, that the octave is the only concord which admits of being added to itſelf, without producing a diſcord; 2dly, that the complement of every concord to an octave (or to 2, 3, 4, &c. octaves,) is a concord; 3dly, that all the ſimple combinations by one, by two, or by three, of our concordant elements 4th, III and 3d, produce concords; 4thly, after theſe ſimple combinations are made, no farther ones can be made, except the addition of an equal number of each of the concordant elements (as 4 + III + 3, ²4 + 2 III + ²3, &c.) without producing diſcords; &c. If the difference between any two concords be wanted, as between the XVII and the X, ſuch is readily obtained from column 7th thus; ²4 + 3 III + ²3 – 4 – 2 III – 3 is equal to 4 + III + 3, or the octave. The ſum alſo of any concords, as a VI and 6th, is thus obtained; 4 + III + 4 + 3, or ²4 + III + 3, which anſwers to the 11th, as before obſerved, when explaining the uſes of column 1.

It may be of uſe here to mention, that the differences between each adjoining concord, in each ſeveral octave in column 7, will be found to be 3d, III – 3 (or the minor ſemitone, $\frac{24}{26}$), 4 – III (or the major ſemitone $\frac{15}{16}$) III + 3 – 4, or V – 4 (or the major ſemitone $\frac{8}{9}$), 4 – III, III – 3, and 3d; and this, whether we begin at the top or at the bottom of the octave. which ſhews that nature has diſtributed theſe ſix concords, in a ſurpriſingly uniform manner, between the uniſon and the octave. The intervals which will, in addition to thoſe above, be found by deducting every concord within the octave from each other, are, 4 – 3 (or the minor tone, $\frac{9}{10}$) and 4 + III – 3, or VI – 3 (or the comma-deficient tritone or ſharp fourth $\frac{18}{25}$).

It has been remarked by Mr. Holder, that the number 6 combined with itſelf, or with every leſs integer, produces in every inſtance a concord, thus $\frac{6}{6}$, $\frac{6}{5}$, $\frac{6}{4}$, $\frac{6}{3}$, $\frac{6}{2}$, and $\frac{6}{1}$, expreſs the uniſon, 3d, V, VIII, XII and XIX.

Concord, or *Concordia*, in *Mythology*, was perſonified by the Romans, and worſhipped as a deity under this appellation. Concord is commonly repreſented on coins as a graceful female, holding a cup in her right hand, and in her left ſometimes a ſceptre, and at other times a cornucopia, to intimate that plenty is the reſult of unanimity and friendſhip. Her ſymbols were two hands joined, as is ſeen on a coin of Aurelius Verus, and another of Nero; alſo two ſerpents twiſting round a caduceus. Mr. Spence obſerves, that concord is ſometimes repreſented with two cornucopias in one of her hands, a thing, ſays he, which I do not remember to have ſeen in any figure but her's, and as agreement often doubles the advantages we receive from the world, they ſeem to be given her with more propriety than perhaps they could be to any other.

Concord, *Temple of*, a building erected in Rome, at the expence of the public, upon an eminence at the foot of the capitol; ſo that it was ſeen from the forum, and the places where the aſſemblies were held and juſtice was adminiſtered. This temple was built in purſuance of a vow of Camillus to this purpoſe. See the article Camillus.

Concord had ſeveral other magnificent temples, beſides this and another erected by Tiberius, at the requeſt of his mother Livia. In one of theſe temples were depoſited the rich ſpoils of the temple of Jeruſalem.

CONCORDANCE, a dictionary or index to the bible, wherein all the leading words, uſed in the courſe of the inſpired writings, are ranged alphabetically; and the various places where they occur referred to; to aſſiſt in finding out paſſages, and comparing the ſeveral ſignifications of the ſame word.

Cardinal Hugo de St. Charo is ſaid to have employed five hundred monks at the ſame time in compiling a Latin concordance: beſides which, we have ſeveral other concordances in the ſame language; one, in particular, called the concordance of England, compiled by J. Darlington, of the order of Prædicants; another more accurate one, by the Jeſuit de Zamora.

R. Mordecai Nathan has furniſhed us with a Hebrew concordance, firſt printed at Venice in 1523, containing all the Hebrew roots branched into their various ſignifications, and under each ſignification all the places in ſcripture wherein it occurs: but the beſt and moſt uſeful Hebrew concordance is that of Buxtorf, printed at Baſil in 1632.

Dr. Taylor publiſhed, in 1754, a Hebrew concordance in two volumes folio, adapted to the Engliſh Bible, and diſpoſed after the manner of Buxtorf. See the preface of this work.

The Greek concordances are only for the New Teſtament: indeed we have one of Conr. Kircher's on the Old; but this is rather a concordantial dictionary than a concordance; containing all the Hebrew words in an alphabetical order; and underneath, all the interpretations or ſenſes the LXX. give them; and in each interpretation, all the places where they occur in that verſion.

In 1718, Trommius publiſhed his Greek concordance for the Septuagint at Amſterdam, in two volumes folio; and Schmidius, improving on a ſimilar work of H. Stephens has given an excellent Greek concordance for the New Teſtament, the beſt edition of which is that of Leipſic, an. 1717.

Calaſius, an Italian Cordelier, has given us concordances of the Hebrew, Latin, and Greek, in two columns: the firſt, which is Hebrew, is that of R. Mordecai Nathan, word for word, and according to the order of the books and chapters: in the other column is a Latin interpretation of each paſſage of Scripture quoted by R. Mordecai; this interpretation is Calaſius's own; but in the margin he adds that of the LXX. and the Vulgate, when different from his. The work is in four volumes folio, printed at Rome in 1621.

Of all the helps towards underſtanding the Hebrew Scriptures, ſays Dr. Geddes (Proſpectus, p. 71.) a good concordance is undoubtedly the moſt uſeful. But we yet want a good concordance; and the man who ſhould devote five or ſix years to the compiling of one from Buxtorf, Calaſio, Noldius, Taylor, Kircher, Montfaucon, and Trommius, would do a ſingular ſervice to biblical ſtudies. Buxtorf's method of arrangement, with very little improvement, ſhould be ſtrictly followed; the errors of orthography rectified from the authority of manuſcripts and other ſources of emendation; and the various acceptations of the ſame word in the ancient verſions exactly noted and methodically diſtinguiſhed. Such a work would be worth all the commentaries that have ever been made.

We have ſeveral very copious concordances in Engliſh; as Newman's, &c. but the laſt and beſt eſteemed is that in 4to. by Alex. Cruden.

CONCORDANT *Elements*, in *Muſic*, are the fourth (4^{th}) the major third (III) and the minor third (3^{rd}); ſee Concord. Dr. Smith conſiders the major tone (τ) the minor tone (t) and the hemitone (*s*) as elements; Harmonics, p. 13.

Concordant *Verſes*, ſuch as have ſeveral words in common; but which, by the addition of other words, convey an oppoſite, at leaſt, a different meaning. Such are theſe.

$$\textit{Et}\left\{\begin{matrix}\textit{Canis}\\ \textit{Lupus}\end{matrix}\right\}\textit{in ſilva}\left\{\begin{matrix}\textit{venatur}\\ \textit{nutritur}\end{matrix}\right\}\textit{\& omnia}\left\{\begin{matrix}\textit{ſervat.}\\ \textit{vaſtat.}\end{matrix}\right.$$

CONCORDAT, in the *Canon Law*, denotes a covenant, or agreement concerning ſome beneficiary matter, as a reſignation, permutation, promotion, or the like.

The council of Trent, ſeſſ. vi. *de reform.* cap. 4. ſpeaking of concordats made without the authority and approbation of the pope, calls them *concordias quæ tantum ſuos obligant auctores, non ſucceſſores*. And the congregation of cardinals, who have explained this decree, declares alſo, that a concordat cannot be valid ſo as to bind ſucceſſors, unleſs confirmed by the pope.

Concordat is alſo uſed, abſolutely, among the French, for an agreement concluded at Bologna in 1516, between pope Leo X. and Francis I. of France, for regulating the manner of nominating to benefices. The concordat ſerves in lieu of the pragmatic ſanction, which has been abrogated; or, rather, it is the pragmatic ſanction ſoftened and reformed. The king went in perſon to the parliament to offer the concordat to be regiſtered, and letters patent were made out, requiring all the judges and courts of juſtice to obſerve this act, and ſee it executed. The parliament, after deliberating a month upon this important matter, concluded not to regiſter the concordat, but to obſerve ſtill the pragmatic ſanction, unleſs the former edict was received and eſtabliſhed in as great an aſſembly as that was, which publiſhed the latter in the reign of Charles VII. And when, by violence and force, they were obliged to publiſh the concordat, they joined to the publication a ſolemn proteſt and an appeal from the pope to the next general council, into both which meaſures the univerſity and the clergy entered with the greateſt alacrity and zeal. But royal and papal deſpotiſm at length prevailed. The chancellor De Prat, who was principally concerned in promoting the concordat, has been generally regarded as an enemy to the liberties of the Gallican church. The illuſtrious and learned Hainault has defended his memory againſt this accuſation, and juſtified the concordat as an equitable contract, and as a meaſure attended with fewer inconveniences, than the pragmatic ſanction. He obſerves, that by the king's being inveſted by the concordat with the privilege of nominating to the biſhoprics and vacant benefices of the firſt claſs, many corruptions and abuſes were prevented, which aroſe from the ſimoniacal practices that prevailed almoſt every where, while, according to the pragmatic ſanction, every church choſe its biſhop, and every monaſtery its abbot. He obſerves moreover, that this nomination was the natural right of the crown, as the moſt conſiderable part of the great benefices had been created by the kings of France; and he particularly inſiſts on this conſideration, that the right which Chriſtian communities have to chuſe their leaders, cannot be exerciſed by ſuch large bodies without much confuſion and many inconveniences; and that the ſubjects, by entruſting their ſovereign with the government of the ſtate, inveſt him, *ipſo facto*, with an authority over the church, which is a *part* of the ſtate, and its nobleſt branch. The moſt ſpecious objection that was made to the concordat was this: that, in return for the nomination to the vacant benefices, the king granted to the popes the annates, or firſt fruits, which had too long been complained of as an intolerable grievance. There is, however, no mention of this equivalent in the concordat. And it was by a papal bull that ſucceeded this compact, that the pontiffs claimed the payment of the firſt fruits, of which they had put themſelves in poſſeſſion in the year 1316, and which had been ſuſpended by the pragmatic ſanction.

As the concordat gave to the kings of France the abſolute right of ſucceeding to all the great, or what are called the conſiſtorial benefices, of the Gallican church; it was a very important edict. Since the eſtabliſhment of the pragmatic ſanction and of the concordat, the clergy of France in general (before the late Revolution) manifeſted leſs reſpect to the decrees of the papal court than the clergy of any other Catholic country. In all the diſputes which their ſovereign has had with the pope, they have almoſt conſtantly taken part with the former. Their independence on the court of Rome ſeems to have been principally founded on this act.

The concordat between the pope and the republic of Venice reſembles the former.

There is alſo a German concordat, made between the emperor Frederic III. and the princes of Germany, in 1448, relating to beneficiary matters, confirmed by pope Nicholas V.

Concordat, as it is now uſed in France, is a term that applies excluſively to an agreement or convention exchanged between the pope, Pius VII., and the French government, the 23d Fructidor, an. 9, or September the 10th, 1801. In this agreement the Roman catholic religion is acknowledged to be that of the majority of the French people; and the better to conſolidate the reſtoration of its worſhip, which had been almoſt totally neglected ſince the year 1792, the pope engages not to diſturb the proprietors or purchaſers of eſtates, which, before the French revolution of 1789, belonged to the church; and he acknowledges in the firſt conſul of the French government the ſame rights and prerogatives which the ancient government poſſeſſed. By virtue of the ſaid concordat, the whole territory of European France is divided into ten archbiſhoprics; *viz.* Paris, containing eight biſhoprics, Malines ſeven, Beſançon five, Lyons four, Aix four, Toulouſe five, Bourdeaux three, Bourges three, Tours ſeven, and Rouen four; and fifty biſhoprics; *viz.* Troyes, Amiens, Soiſſons, Arras, Cambray, Verſailles, Meaux, Orleans, Namur, Tournay, Aix la Chapelle, Treves, Gand, Liege, Mayence, Autun, Metz, Straſbourg, Nancy, Dijon, Mende, Grenoble, Valence, Chambéry, Nice, Avignon, Ajaccio, Digne, Cahors, Montpellier, Carcaſſonne, Agen, Bajonne, Poitiers, La Rochelle, Angoulême, Clermont, Saint Flour, Limoges, Le Mans, Angers, Nantes, Rennes, Vannes, Saint Brieux, Quimper, Coutances, Bayeux, Siez, and Evreux. The nomination to the ſees reſts with the French government; the pope only confirms each nomination by his canonical inſtitution, according to the forms anciently eſtabliſhed with regard to the Gallican church, whoſe privileges and immunities continue in full force. The biſhops, before they enter upon their functions, ſhall take before the firſt conſul, in perſon, the oath of fidelity which was in uſe before the change of government, expreſſed in the following terms; "I ſwear and promiſe to God, upon the holy evangeliſts, to preſerve obedience and fidelity to the government eſtabliſhed by the conſtitution of the French republic. I alſo promiſe to have no correſpondence, nor to aſſiſt at any council or cabal, either within the country or out of it, that ſhall be contrary to the cauſe of the public tranquillity; and if in my dioceſe, or elſewhere, I ſhall learn of any plot or machination prejudicial to the ſtate, I ſhall inform the government of it." The clergy of the ſecond order ſhall take the ſame oath before the civil authorities appointed by the government. The following prayer ſhall be recited at the end of divine ſervice in all the Catholic churches of France:

Domine, ſalvam fac rempublicam!
Domine, ſalvos fac conſules!

The biſhops ſhall make a new diviſion of pariſhes in their dioceſes, ſubject to the conſent of the government: the biſhops ſhall name the curés, ſubject to the approbation of the government. The biſhops may have a chapter in their cathedral, and a ſeminary in their dioceſe, but the government is not engaged to endow them. All the metropolitan, cathedral, parochial, and other churches, undiſpoſed of, ſhall be placed at the diſpoſal of the biſhops. The government engages to ſecure a ſuitable proviſion for the biſhops and curés, whoſe dioceſes and pariſhes ſhall be marked out by the new diviſion. The allowance of the archbiſhops ſhall be 15,000 livres annually, and that of the biſhops 10,000. Biſhops may add to their titles the qualification of "citoyen," or "monſieur." No man can be named a biſhop but a Frenchman, aged at leaſt 30 years, having an atteſtation of his morals delivered by a biſhop, and after an examination of his doctrine by a biſhop and two prieſts: nor ſhall biſhops quit their ſees without the permiſſion of the firſt conſul. Biſhops are required to viſit every year a part of their dioceſe, and the whole every five years. No clergyman ſhall be ordained as prieſt, who is not 25 years of age, and poſſeſſed of 300 livres annual revenue. The curés ſhall reſide in their pariſhes; and prieſts, who do not regularly belong to any dioceſe, ſhall not officiate. The clergy in general ſhall wear black clothes; and the biſhops violet-coloured ſtockings. There ſhall be a liturgy and a catechiſm for the French church. The names of the days ſhall be as in the ancient calendar; and Sunday ſhall be the day of reſt for the public functionaries; nor ſhall any other holidays, except Sundays, be kept without the conſent of the government. The bells ſhall only be rung for divine ſervice. The ſame temple ſhall be conſecrated only to one form of worſhip. The nuptial benedictions ſhall be only given by the clergy to thoſe who have been married by the civil officers.

With regard to the Proteſtant religion, no perſon ſhall exerciſe the miniſterial functions but a Frenchman; nor ſhall the Proteſtant churches and their miniſters have any connection with any foreign power. The miniſters and their communities ſhall pray for the proſperity of the French republic, and the conſuls. No doctrine, nor alteration of doctrine, ſhall be publiſhed or taught, without being firſt authorized by the government. The maintenance of the miniſters ſhall be provided for, wherever the property and oblations of the communities fall ſhort. The articles for the liberty of foundations, in the organic laws of the Catholic worſhip, ſhall be common to the Proteſtant churches. There ſhall be two ſeminaries, one in the eaſt of France, for the inſtruction of miniſters of the confeſſion of Augſburg; and the other at Geneva for the reformed churches. The profeſſors are to be named by the firſt conſul, and no miniſter to be appointed without a certificate of his having ſtudied in the ſeminary of his religion. The regulations of the ſeminaries are to be ſettled by the government. The reformed churches of France ſhall have paſtors, local conſiſtories, and ſynods. There ſhall be a conſiſtorial church for every 6000 ſouls of the ſame communion. Five conſiſtorial churches ſhall form the diſtrict of a ſynod. The number of miniſters or paſtors in the ſame conſiſtorial church cannot be increaſed without the authority of government; nor can the paſtors reſign without ſtating their motives to government, which ſhall approve or reject them. The title of election ſhall be preſented to the firſt conſul for his approbation. Each ſynod ſhall conſiſt of a paſtor and a notable of each church. The ſynods ſhall ſuperintend the celebration of worſhip and conduct of eccleſiaſtical affairs, and all their deciſions ſhall be ſubmitted for the approbation of government. The ſynods cannot aſſemble until they ſhall have received the permiſſion of government; nor ſhall any ſynodal aſſembly laſt more than ſix days.

The churches of the confeſſion of Augſburg ſhall have paſtors, local conſiſtories, inſpections, and general conſiſtories. The paſtors and conſiſtorial churches ſhall be ſubject to the regulations preſcribed for the reformed paſtors and churches. The churches of this confeſſion ſhall be ſubordinate to the inſpections. Five conſiſtorial churches ſhall form an inſpection, which is to aſſemble only by permiſſion of government. Each inſpection to chooſe an inſpector, and two laymen of ſuch choice to be confirmed by the firſt conſul. There are to be three general conſiſtories; one at Straſburg, for the Proteſtants of Augſburg, of the departments of the Upper and Lower Rhine; a ſecond at Mentz, for thoſe of the departments of the Sarte and Mont-Tonnerre; and the third at Cologne, for thoſe of the departments of the Rhine, Moſelle, and Roer.

Concordat *Militaire*, Fr., an agreement entered into by officers of the ſame corps, to eſtabliſh a fund or proviſion for one of them that quitted it. This agreement, however, was only tolerated in particular caſes and circumſtances, to which the chiefs ſeemed to conſent, without either openly, or with their ſignatures, giving their approbation to the ſame.

CONCORDIA, in *Ancient Geography*, a town of Italy, with the title of colony; placed by Ptolemy in the country of the Carni, but by Pliny in that of the Veneti, between Pons Liquentiæ and Tilavemptus. Eutropius and the Itinerary of Antonine place it in Venetia. It took the name of *Julia*, becauſe a colony had been ſent thither by Julius Cæſar.—Alſo, a town of Spain, placed by Ptolemy in Luſitania, ſuppoſed to have been the preſent *Tomar*.—Alſo, a town and Roman fortreſs of Gaul, in Germania Prima, between Brocomagum and Noviomagum, according to the Itinerary of Antonine.

Concordia, in *Geography*, a town of Italy, in the duchy of Mirandola, on the Sechia; 6 miles W. of Mirandola; between which cities there is a fine canal, which facilitates the communication of both.—Alſo, a town of Italy, in the country of Friuli; which, though in ruins, is the ſee of a biſhop, who reſides at Porto Gruaro.

CONCOTS, a town of France, in the department of the Lot; 3 leagues S.S.E. of Cahors.

CONCOU, in *Botany*, a name given by the people of Guinea to an herb which is in great eſteem with them for killing that troubleſome ſort of worm called the Guinea-worm, which breeds in their fleſh. They bruiſe the leaves, and mixing them with oil, apply them in form of a cataplaſm. The leaves of this ſhrub ſomewhat reſemble thoſe of the caggow, but they are thicker and ſtiffer, and are not ſo full of veins. They are broadeſt within one third of the baſe, and from thence they go tapering to each end. They are placed on long footſtalks of a fine green throughout. Phil. Tranſ. N° 232.

CONCOURES, in *Geography*, a town of France, in the department of the Aveiron, and diſtrict of Rhodez; 7 miles N.N.E. of Rhodez.

CONCOURSE, or CONCURRENCE, the reciprocal action of divers perſons or things co-operating toward the ſame effect or end.

The ſchoolmen diſtinguiſh two kinds of concurrence; *viz.* mediate, which conſiſts in giving a power or faculty to act; and immediate, which is a contemporary influence of one cauſe along with another, to produce an effect. Thus, the grandfather concurs mediately to the production of a grandſon, as he originally gives the power of generating to the father; but the father concurs immediately with the mother to the production of the ſame child. With reſpect to the agency of God, ſome divines maintain both theſe kinds of concurrence; others deny the latter. See CAUSE.

CONCOURSE, *Point of.* See FOCUS.

CONCQUE, Fr. A piece of artillery, of which the bore is wider towards the muzzle than towards the breech. It is alſo the name of a ſhell, which the ancients made uſe of in their armies inſtead of a trumpet.

CONCRESSAUT, or CONCORSAUT, in *Geography*, a town of France, in the department of the Cher, on the Saudre, almoſt ruined by the civil wars; 25 miles N. of Bourges.

CONCRETE, in the *School Philoſophy*, an aſſemblage, or COMPOUND.

CONCRETE, *Phyſical*, or a CONCRETE *body*, may denote any mixed body, or body compoſed of different principles; and conſequently, all ſenſible bodies whatever, as all bodies ariſe from a coalition of divers elements, or at leaſt of divers principles, matter, and form.

But, in ſtrictneſs, concrete is only uſed for thoſe compounds wherein the ingredients ſtill retain their diſtinct natures, nor are wholly converted into any new common nature.

Authors diſtinguiſh *natural* concretes and *artificial* ones: antimony is a *natural* concrete, and ſoap a *factitious* concrete.

CONCRETE *Juices.* See JUICES.

CONCRETE, *Logical*, or a CONCRETE *word*, called alſo *paronymum*, is that which has a compound ſignification, as denoting both the ſubject and ſome quality or accident of the ſubject, which gives it its denomination.

Such, *e. gr.* are *man*, *learned*, *white*; for *man* ſignifies as much as *having human nature*; *learned*, as much as *having learning*, &c. Hence, the word concrete is chiefly uſed to expreſs the union of qualities or quantities with the bodies or ſubjects, without any ſeparation, even in idea. The oppoſite term, whereby things are ſeparated in thought, is *abſtract*.

Concrete properly ſignifies a ſubject accompanied with its form or quality; as *pious*, *hard*, *white*: *abſtract*, on the contrary, expreſſes the form and quality without the ſubject, as *piety*, *hardneſs*, *whiteneſs*.

CONCRETE *Numbers*, are thoſe which are applied to expreſs or denote any particular ſubject: as two men, three pounds, two thirds of a ſhilling, &c.

Whereas, if nothing be connected with a number, it is taken abſtractedly or univerſally: thus, three ſignifies only an aggregate of three units; let thoſe units be men, pounds, or what you pleaſe.

CONCRETION, the act whereby ſoft bodies are rendered hard; or an inſenſible motion of the particles of a fluid or ſoft body, whereby they come to a conſiſtence.

The word is uſed indifferently for *induration*, *condenſation*, *congelation*, and *coagulation*.

CONCRETION is alſo uſed for the coalition of ſeveral little particles into a ſenſible maſs, called a CONCRETE; by virtue of which union, the body acquires this or that figure, and theſe or thoſe properties.

CONCRETION, in *Surgery*, from *concretio*, the adheſion or growing together of parts. This term alſo denotes the impacting or cohering of ſubſtances together, ſo as to form a maſs; as in the ſanguineous concretion, the bilious or biliary concretion, the calculous concretion, &c. The coaleſcence of parts which ought to be ſeparate, as of the fingers and eyelids, might be rather called agglutination or coheſion.

Membranes and other parts may adhere together, either from natural or accidental cauſes; but the moſt frequent cauſe of external concretions is an ulceration or abraſion of the ſkin, ſo that two ſurfaces lying in contact ſhall unite by inflammation and reciprocal granulation. In all ſuch caſes, where an operation is practicable and neceſſary, the ſurgeon muſt ſeparate the united parts with a ſcalpel, and keep them aſunder during the cure. See STONE and CALCULUS.

CONCUBINAGE ſometimes expreſſes a criminal, or prohibited commerce between the two ſexes; in which ſenſe it comprehends *adultery*, *inceſt*, and *ſimple fornication*.

Promiſcuous concubinage is productive of a great variety of evils, and tends not only to the corruption, but to the ultimate deſtruction, both of individuals and of ſociety. It is not only ineffectual to promote love, and the tender affections, either between perſons themſelves, or towards their offspring, but it contributes towards exciting and maintaining endleſs jealouſies and quarrels among mankind. The great and radical miſchief attending unreſtrained promiſcuous concubinage in a ſtate of ſociety, conſiſts in its tendency to diminiſh marriages, and thus to defeat the ſeveral beneficial purpoſes reſulting from this inſtitution. (See MARRIAGE.) It diſcourages marriage by weakening the force of a very urgent motive and temptation to it, ariſing from the intention of the original former of mankind, and the conſtitution of human nature. "The male part of the ſpecies," ſays Dr. Paley, "will not undertake the incumbrance, expence, and reſtraint of married life, if they can gratify their paſſions at a cheaper price; and they will undertake any thing rather than not gratify them."

A juſt idea may be formed of the magnitude of this miſchief, by attending to the importance and variety of the uſes to which marriage is ſubſervient; and by duly conſidering that the malignity and moral quality of each crime are not to be eſtimated by the particular effect of one offence, or of one perſon's offending, but by the general tendency and conſequence of crimes of the ſame nature. The libertine may not be conſcious that thoſe irregularities hinder his own marriage; from which, as he may allege, he is deterred by different conſiderations; nor may he perceive, or be diſpoſed to acknowledge, that his indulgences hinder the marriage of others; but it behoves him to reflect, what would be the conſequence of univerſal licentiouſneſs in this reſpect, and what ſhould prevent its becoming univerſal, if it be innocent or allowable in him. Moreover, fornication ſupports proſtitution; and proſtitution entails on its victims almoſt certain miſery, occaſioned by the indigence, diſeaſe, and inſult, to which theſe wretched outcaſts of ſociety, who infeſt populous cities, are ſubject; the whole aggregate of which is a general conſequence of fornication, and to the increaſe and continuance of which, every act and inſtance of fornication contribute. Beſides, fornication promotes habits of ungovernable lewdneſs, which introduce the more aggravated crimes of ſeduction, adultery, violation, &c.; to which we may add, in this connection, that the criminal commerce of the ſexes depraves the mind and moral character more than any ſingle ſpecies of vice whatſoever; theſe indulgences prepare an eaſy admiſſion for every other crime: in low life, they are uſually the firſt ſtage in men's progreſs to the moſt deſperate villainies; and, in high life, to that lamented diſſoluteneſs of principle which manifeſts itſelf in a profligacy of public conduct, and a contempt of the obligations of religion and moral probity. Habits of libertiniſm alſo incapacitate and indiſpoſe the mind for all intellectual, moral, and religious pleaſures, which would very much contribute to every man's happineſs.

It deſerves further to be conſidered, that fornication perpetuates a diſeaſe, which may be accounted one of the ſevereſt maladies of human nature; and the effects of which are ſaid to contaminate the conſtitution of even diſtant generations. This dreadful malady, the ſevereſt ſcourge, ſays Dr. Robertſon, (Hiſt. of America, vol. ii. p. 87), with which, in this life, offended Heaven chaſtens the indulgence of criminal deſires, ſeems to have been peculiar to the Americans; and he adds, that by communicating it to their conquerors, they have not only amply revenged their own wrongs, but by adding this calamity to thoſe which formerly embittered human life, they have, perhaps, more than counterbalanced all the benefits which Europe has derived from the diſcovery of the New World.

Dr. Hartley, in his "Obſervations on Man," (p. 443), remarks, that the ſhameful, loathſome, and often fatal diſeaſe, which peculiarly attends the vice of lewdneſs, may be conſidered as a moſt unqueſtionable evidence of the Divine Will. This diſeaſe, with all its conſequences, would ſoon ceaſe among mankind, could they be brought under the reſtraints of lawful marriage; but muſt ever continue, whilſt licentiouſneſs continues. Without this check, however, the licentiouſneſs which has always been obſerved to follow improvements in arts and politeneſs, and to attend upon bodies politic in their declenſion, and which the corruption of the Chriſtian religion in ſome, and the diſbelief of it in others, have, in a manner, authorized, would have brought on utter diſſoluteneſs in this weſtern part of the world, ſuch as would have been inconſiſtent with the very exiſtence of regular government. Nay, it may be, that this will ſtill be the caſe, and that we are haſtening to our period, through the great wickedneſs of the world in this reſpect particularly, though our lives, as a body politic, be ſomewhat prolonged by this correction.

If we appeal to the Chriſtian ſcriptures on the ſubject of this article, it is certain that theſe ſacred writings condemn fornication abſolutely and peremptorily, and that they claſs this crime with murders, thefts, falſe witneſs, and blaſphemies. Beſides, the aggravated ſin of idolatry is repreſented by adultery and fornication in the prophetic writings. Although the ſcriptures give no ſanction to thoſe auſterities which have been impoſed upon the world under the name of Chriſtianity, as the celibacy of the clergy, the practice of perpetual virginity, the "prohibitio concubitûs cum gravidâ uxore;" yet, with a juſt regard to the condition and intereſt of the human ſpecies, they have provided, by the marriage of one man with one woman, an adequate gratification for the propenſities of their nature, and have *reſtrained* them to that gratification. The avowed toleration, and in ſome countries the licenſing, taxing, and regulating of public brothels (ſee BAWDY-HOUSE), have appeared like a ſanction of fornication, and have contributed, with other concurring cauſes, ſo far to vitiate the public opinion, that there is no practice, the immorality of which is ſo little thought of or acknowledged, although there are few in which it can be more eaſily and more ſatisfactorily evinced. The legiſlators who have patronized receptacles of proſtitution ought to have foreſeen this effect, and alſo to have conſidered, that whatever facilitates fornication, diminiſhes marriage. As to the uſual apology for this relaxed diſcipline, the danger of greater enormities if acceſs to proſtitutes were too ſtrictly watched and prohibited, "it will be time enough," ſays Dr. Paley, "to look to that, when the laws and magiſtrates have done their utmoſt." After all, theſe fears are without foundation in experience. The men are in all reſpects the moſt virtuous, in countries where the women are the moſt chaſte.

In its more reſtrained ſenſe, concubinage is uſed for a man's and a woman's cohabiting together in the way of marriage without having paſſed the ceremony thereof.

This ſpecies of cohabitation is, without doubt, diſtinguiſhable from vagrant concubinage, and by reaſon of its reſemblance to marriage, may be thought to participate of the ſanctity and innocence of that ſtate. In modern phraſe, it is denominated "the keeping of miſtreſſes," under the ſuppoſed favourable circumſtance of mutual fidelity. For this practice the following kind of apology has been ſometimes alleged:

"That the marriage rite being different in different countries, and in the ſame country among different ſects, and with ſome, ſcarcely any thing; and, moreover, not being preſcribed or even mentioned in ſcripture, can be regarded only as a form or ceremony of human invention; and that, conſequently, if a man and woman betroth and confine themſelves to each other, their intercourſe muſt be the ſame, as to all moral purpoſes, as if they were legally married; for the addition or omiſſion of that which is a mere form and ceremony can make no difference in the ſight of God, or in the actual nature of right and wrong."

To this ſpecious ſort of reaſoning, archdeacon Paley has replied:

1. If the ſituation of the parties be the ſame thing in marriage, why do they not marry? 2. If the man chooſe to have it in his power to diſmiſs the woman at his pleaſure, or to retain her in a ſtate of humiliation and dependence inconſiſtent with the rights which marriage would confer upon her, it is not the ſame thing. 3. It is not at any rate the ſame thing with reſpect to the children. Moreover, as to the marriage rite being a mere form, and that alſo variable, the ſame may be ſaid of ſigning and ſealing of bonds, wills, deeds of conveyance, and the like, which yet make a great difference in the rights and obligations of the parties concerned in them. And with reſpect to the rite not being appointed in ſcripture, the ſcriptures forbid fornication, that is, cohabitation without marriage, leaving to the law of each country to pronounce what is, or what makes, a marriage; in like manner as they forbid theft, that is, the taking away of another's property, leaving it to the municipal law to fix what makes the thing property, or whoſe it is, which alſo,

as well as marriage, depends on arbitrary and mutable forms. Independently of the injunctions of ſcripture, the plain account of the queſtion ſeems to be this; it is immoral, becauſe it is pernicious, that man and woman ſhould cohabit, without undertaking certain irrevocable obligations, and mutually conferring certain civil rights: if, therefore, the law has annexed theſe rights and obligations to certain forms ſo that they cannot be ſecured or undertaken by any other means, which is the caſe in this inſtance (for whatever the parties may promiſe to each other, nothing but the marriage ceremony can make their promiſe irrevocable), it becomes in the ſame degree immoral, that men and women ſhould cohabit without the interpoſition of theſe forms. Paley's Principles of Moral and Political Philoſophy, vol. 1. b. 3. c. 2.

Concubinage was anciently tolerated: the Roman law calls it an allowed cuſtom, *licita conſuetudo*. When this expreſſion occurs in the conſtitutions of the Chriſtian emperors, it ſignifies what we now call a "marriage in conſcience."

The concubinage tolerated among the Romans in the time of the republic, and of the heathen emperors, was that between perſons not capable of contracting marriage together: nor did they even refuſe to let inheritances deſcend to children which ſprung from ſuch a tolerated cohabitance.

Concubinage between ſuch perſons they looked on as a kind of marriage, and even allowed it ſeveral privileges: but then this concubinage was confined to a ſingle perſon, and was of perpetual obligation, as much as marriage itſelf. Hottoman obſerves, that the Roman laws had allowed of concubinage long before Julius Cæſar made that law whereby every one was allowed to marry as many wives as he pleaſed. The emperor Valentinian, Socrates tells us, allowed every man two.

Concubinage is alſo uſed for marriage performed with leſs ſolemnity than the formal marriage; or a marriage with a woman of inferior condition, and to whom the huſband does not convey his rank, or quality.

Cujas obſerves, that the ancient laws allowed a man to eſpouſe, under the title of concubine, certain perſons, ſuch as were eſteemed unequal to him, on account of the want of ſome qualities requiſite to ſuſtain the full honour of marriage. He adds, that though concubinage was beneath marriage, both as to dignity, and civil effects; yet was concubine a reputable title, very different from that of *miſtreſs* among us.

The commerce was eſteemed ſo lawful, that the concubine might be accuſed of adultery in the ſame manner as a wife.

This kind of concubinage is ſtill in uſe in ſome countries, particularly in Germany, under the title of a *half-marriage*, *morgengabic marriage*, or *marriage with the left hand*; alluding to the manner of its being contracted, *viz.* by the man's giving the woman his left-hand inſtead of the right.

This is a real marriage, though without ſolemnity: the parties are both bound for ever; though the woman be thus excluded from the common rights of a wife, for want of quality or fortune.

The children of concubines were not reputed either legitimate or baſtards, but natural children, and were capable only of donations.

They were deemed to retain the low rank of the mother; and were on this ground unqualified for inheriting the effects of the father.

Concubinage, in a *Legal Senſe*, is uſed as an exception againſt her that ſueth for dower, alleging thereby, that ſhe was not a wife lawfully married to the party, in whoſe lands ſhe ſeeks to be endowed, but his concubine. Brit. c. 107. Bract. lib. iv. tract. 6. cap. 8.

CONCUBINE, a woman whom a perſon takes to cohabit with him, in the manner, and under the character, of a wife, without being authorized thereto by a legal marriage.

Concubine is alſo uſed for a real, legitimate, and only wife, diſtinguiſhed by no other circumſtances but a diſparity of birth or condition between her and the huſband. Du-Cange obſerves, that one may gather from ſeveral paſſages in the epiſtles of the popes, that they anciently allowed of ſuch concubines. The ſeventeenth canon of the firſt council of Toledo declares, that he, who with a faithful wife keeps a concubine, is excommunicated; but that if the concubine ſerved him as a wife, ſo that he had only one woman, under the title of concubine, he ſhould not be rejected from communion: which ſhews that there were legitimate wives under the title of concubines.

In effect, the Roman laws did not allow a man to eſpouſe whom he pleaſed; there was required a kind of parity, or proportion, between the conditions of the contracting parties; but a woman of inferior condition, who could not be eſpouſed as a wife, might be kept as a concubine; and the laws allowed of it, provided the man had no other wife.

It is certain the patriarchs had a great number of wives, and that theſe did not all hold the ſame rank; ſome being ſubaltern to the principal wife; which were what we call concubines, or half-wives. The Romans prohibited a plurality of concubines, and only had regard to the children iſſuing from a ſingle concubine, becauſe ſhe might become a legitimate wife. Solomon had 700 wives, and 300 concubines: the emperor of China has ſometimes two or three thouſand concubines in his palace. Q. Curtius obſerves, that Darius was followed in his army by 365 concubines, all in the equipage of queens; and Diodorus Siculus ſays, that he maintained as many as the days of the year. Artaxerxes had by his concubines 115 children. The concubines were introduced to the Perſian king, each in her turn; whence ſome have concluded, that the ancient Perſian year conſiſted of 360 days, ſince ſeveral of the Perſian monarchs had this number of concubines, who went to their kings in conſtant courſe.

CONCUPISCENCE, among divines, an irregular deſire, appetite, or luſt after carnal things, inherent in human nature.

The dominion or prevalence of concupiſcence, according to F. Malebranche, is what we call original ſin.

The origin of concupiſcence he aſcribes to thoſe impreſſions made on the brain of our firſt parents at their fall; which are ſtill tranſmitted and continued on thoſe of their children; for as animals produce their like, and with like traces in the brain (whence the ſame ſympathies and antipathies in the ſame kind; and whence the ſame conduct on the ſame occaſions); ſo our firſt parents, after their fall, received ſuch deep traces in the brain, by the impreſſion of ſenſible objects, that they might well be ſuppoſed to communicate them to their children.

The ſchoolmen uſe the term *concupiſcible appetite* for the deſire we have of enjoying any good; in oppoſition to *iraſcible appetite*, whereby we eſchew what is evil.

CONCURRENCE. See Concourse.

CONCURRING, or Congruent *Figures*, in *Geometry*, ſuch as, being laid upon one another, do exactly correſpond to, and cover one another, and conſequently muſt be equal among themſelves. Thus, triangles having two ſides and the contained angle equal each to each, appear to be equal to one another in all reſpects. See Congruity.

CONCUSSION *crimen repetundarum*, in *Juriſprudence*, is the abuſe of power by ſome perſon entruſted with a public commiſſion or employment; by extorting money from thoſe under his power or command. This crime is taken notice of in the heads of the Digeſt, or Code—*ad legem Juliam repetundarum;* and it is to be obſerved, that he who gave a bribe contrary to the oath he had taken, might be proſecuted as well as the receiver: and that the judge who was corrupted was deemed guilty of concuſſion, as much as he who purchaſed property which was in a courſe of litigation. The magiſtrates were even forbidden to acquire any thing by way of purchaſe, donation, or otherwiſe, in the provinces wherein they reſided, under pain of being guilty of concuſſion.

The crime of concuſſion was not ranked in the number of public offences, except when committed by a magiſtrate; when committed by a perſon of inferior ſtation, it was only a private crime; but it is not the quality of the perſon which renders the crime public or private, but the nature of the crime itſelf.

Concussion, in *Surgery*, from *concutio*, a ſhaking together. This term is moſtly applied to a violent commotion of the body, and eſpecially of the brain; but a concuſſion of the nervous ſyſtem in general, or of the ſpinal marrow in particular, may produce the ſame train of ſymptoms in a partial degree, as a commotion of the brain does in the whole body. A concuſſion of the brain may be occaſioned not only by blows on the head, but alſo by violence inflicted upon other parts of the body. It is frequently occaſioned by a fall upon the thighs when ſtretched out ſtraight, or upon the breech; it is alſo obſerved in caſes of contuſion of the face, and fractured bones, occaſioned by a fall from a conſiderable height, in gun-ſhot wounds attended with a ſplintering of the bones, and, in general, in every caſe of external violence attended with conſiderable commotion of the whole body. However, from whatever cauſe it may ariſe, it always requires ſurgical treatment.

Moſt of the ſymptoms attending compreſſion of the brain occur alſo in concuſſion; but in a compreſſed ſtate of the brain they are more permanent. See Compression.

There is no diſcharge of blood from the eyes, noſe, or ears, which frequently happens in compreſſion; and inſtead of that apoplectic ſtertor in breathing which accompanies compreſſion, the patient ſeems to be in a ſound and natural ſleep. The pulſe is irregular and ſlow in compreſſion, and grows ſtronger and fuller by blood-letting; but in concuſſion it is weaker, being ſoft and equal, and ſinks by blood-letting. There are beſides, convulſions in compreſſions, which are not obſerved in a ſtate of concuſſion. The ſymptoms ariſing from concuſſion come on immediately after the injury is received. In the violent degrees of theſe, the patient remains quite inſenſible; the pupils are much dilated, and do not contract though the eyes be expoſed to the ſtrongeſt light.

In more violent accidents, eſpecially when the patient is rendered inſenſible, it is extremely difficult to diſtinguiſh between concuſſion and depreſſion; for ſymptoms which have been ſuppoſed to ariſe entirely from concuſſion, have, after death, been found to be owing to extravaſation or undiſcovered fracture; and extravaſation has been blamed, when, on diſſection, not the leaſt morbid appearance could be diſcovered.

The ſymptoms conſequent upon concuſſion of the brain are various, in proportion to the different degrees of the violence inflicted. In its ſlighteſt degree, it produces ſtupor and inclination to ſleep, debility of the intellectual and corporeal faculties, inſenſibility, or paralyſis of ſome particular part. In the ſecond degree, the patient lies without ſenſation and motion in a ſtate of profound coma, from which he cannot be rouſed. But at the ſame time he is generally reſtleſs, toſſes about, ſpeaks much in his ſleep, ſometimes looks up, ſtares wildly, raves, is affected with convulſions, and generally his pulſe betokens irritation. In the third degree, death ſupervenes, either immediately, or as the ſymptoms increaſe in violence.

Theſe ſymptoms, however, are not always of the ſame nature and origin, and therefore require different methods of treatment. Thus the blood-veſſels of the brain may be weakened in conſequence of the violence inflicted; the blood may be preternaturally accumulated in them, and dilate them, to which ſometimes alſo a congeſtion in the head contributes. Sometimes, alſo, the external violence acts upon the ſubſtance of the brain itſelf and the whole nervous ſyſtem, either by the irritation or by the debility and paralytic ſtate which it induces: in the firſt of theſe caſes ſpaſmodic affections, reſtleſſneſs, want of ſleep, or coma attended with delirium and convulſions, are obſerved, and in the ſecond the patient is thrown into a ſtate ſimilar to ſyncope.

Before the external violence has been inflicted, it may happen that the patient may have been in a ſtate of great anxiety and fear, and he may have been greatly terrified by the danger whilſt it was ſtill impending, in which caſes the conſequences of theſe violent emotions of the mind, may be miſtaken for effects of a concuſſion of the brain. The patient is in a very different ſtate when the injury has been inflicted whilſt he was intoxicated, or in anger, or when his ſtomach was full. Not unfrequently alſo ſome of the ſymptoms proceed from leſions of other parts of the body more remote from the head, or from collateral cauſes, eſpecially from inflammatory, and bilious complaints in the viſcera; which frequently produce not only a determination towards the head, but alſo various other ſymptoms indicative of irritation.

All theſe ſymptoms the ſurgeon muſt take into mature conſideration, in order to be able to form a proper judgment concerning the ſtate of the patient in whom he diſcovers ſymptoms of concuſſion of the brain. Theſe ſymptoms are commonly of a fourfold nature; that is, they are ſymptoms indicative of compreſſion of the brain, and ariſe from the congeſtions in the veſſels; or they are ſymptoms of debility and inactivity of the concuſſed nervous ſyſtem; or they are ſymptoms of irritation in the nervous ſyſtem; or finally, they are conſequences of preternatural irritating cauſes in the abdominal viſcera. Commonly the ſymptoms belonging to each of theſe four different heads are combined; but frequently thoſe of one claſs are more violent than thoſe of the reſt, and to this circumſtance the ſurgeon muſt eſpecially attend in regulating his method of treatment.

With reſpect to the cure, much alſo depends upon making the proper diſtinction between the ſymptoms of concuſſion and thoſe of extravaſation. In many caſes this may eaſily be done; for the ſymptoms of concuſſion come on immediately after the violence has been inflicted, whilſt thoſe of extravaſation generally ſupervene within a longer or ſhorter time after. This criterion is however not always to be depended upon, nor diſcoverable in every caſe; for when the patient was alone at the time when the accident happened, and is now deprived of his ſenſes, the ſurgeon cannot aſcertain whether the ſymptoms followed the accident immediately.

If the ſymptoms abate after the uſe of antiphlogiſtic remedies, ſuch as blood-letting, evacuations, glyſters, waſhing with cold water, &c. they ought to be continued; but in the contrary caſe, they are to be relinquiſhed and an oppoſite method of treatment adopted. The effects of blood-letting alone ſometimes form an important criterion; for in caſes of concuſſion of the brain it frequently lowers the pulſe to a great degree, nay, even aggravates the ſymptoms; whilſt in extravaſations, even though it be frequently repeated, it produces a far leſs deciſive effect upon the pulſe, and frequently alleviates the ſymptoms.

Amongſt the various remedies that have been recommended in concuſſions of the brain, blood-letting is moſt generally employed; but it ought to be moderate. Topical detraction of blood from the head has ſometimes been found uſeful. Purgatives are always very ſerviceable, but in general it is neceſſary to adminiſter them in large and repeated doſes. Still more beneficial are emetics, and amongſt theſe tartar emetic and vitriolated zinc commonly prove the moſt efficacious; though, on account of the inſenſibility of the patient, they muſt uſually be adminiſtered in very large doſes, in order to produce their effect. Many recommend alſo ſtimulating glyſters, and various other ſtimulating remedies; ſuch as the volatile alkalies, bliſters applied to the head, and it is affirmed that ſome have even adminiſtered wine internally with the beſt effects. Cold fomentations are here particularly uſeful, as they are adapted to all caſes, as are likewiſe all the remedies uſually employed in ſyncope. Where there are ſymptoms of irritation, ſpaſms, and convulſions, antiſpaſmodics are frequently found to produce great benefit; and in theſe caſes Dover's powder is particularly recommended. Before uſing it, the warm bath, and when the patient is plethoric, blood-letting is preſcribed. This remedy muſt be continued as long as the ſymptoms remain, and it muſt be repeated when they return. Alſo a mixture of three parts of Vin. Antimonii and one part Tinct. Theb. given in doſes of ten drops every four hours, is found very uſeful. The uſe of laudanum alone has ſometimes removed the ſymptoms of concuſſion.

Notwithſtanding that all the above mentioned remedies ſtand recommended by authentic experience, yet as they are ſo oppoſite to each other in their properties, it cannot poſſibly be adviſeable to preſcribe them all together, or any ſingle one in all caſes; and the ſurgeon has therefore in every ſingle caſe to chooſe thoſe remedies that are particularly adapted to remove the moſt urgent ſymptoms of the diſeaſe. Thus, when the ſymptoms of preternatural repletion of the veſſels of the brain are urgent, he muſt employ blood-letting, cold fomentations, evacuations, and glyſters; to the latter of which it has been particularly recommended to add powder of ſquills: when the urgent ſymptoms are thoſe of debility bordering on ſyncope, he may uſe volatile alkali, wine, epiſpaſtics, cold fomentations, emetics, and other tonic remedies; when the ſpaſmodic ſymptoms are the moſt prominent, Dover's powder, Tinct. Antimon. and laudanum; when the ſymptoms of bilious effuſions prevail, emetics and purgatives.

As there is always reaſon at firſt to ſuſpect an accumulation of blood, and to apprehend inflammation, it will almoſt always be adviſeable firſt to draw blood, unleſs it ſhould be contraindicated by any peculiar ſymptoms. Stimulants and tonics will produce more benefit after the ſymptoms have continued for ſome time, than if adminiſtered at the beginning. If after the firſt or ſecond blood-letting, the pulſe ſinks whilſt the other ſymptoms remain the ſame, or are even aggravated, it ought not to be perſiſted in, but a contrary mode of practice is to be attempted. We may expect advantage from blood-letting, purgatives, and emetics, when the pulſe is full, hard, and quick; from antiſpaſmodics, when it is ſmall and hard; and from ſtimulant and tonic remedies, when it is ſmall and ſoft. Neutral ſalts, gentle purgatives, and blood-letting, may be employed when the patient is ſtrong, vigorous, plethoric, and florid; ſtimulant antiſpaſmodics, when he is weakly, very irritable, pale, and cold.

Finally, we muſt alſo attend to the ſtate in which the patient has been before the injury: ſhould he have received it whilſt in a ſtate of intoxication, cooling evacuants, and blood-letting are neceſſary; if he has received it whilſt his ſtomach was full, or whilſt in a paroxyſm of anger, emetics and purgatives are indicated; if whilſt under the influence of great fear or apprehenſion, tonic and antiſpaſmodic remedies will be proper. Moreover, the head of the patient muſt be carefully guarded againſt all motion and concuſſion during the courſe of the cure.

Should the patient recover under the uſe of the above-mentioned remedies, he muſt ſtill for ſome time after carefully avoid all commotion of the head, and whatever tends to accelerate the circulation, as anger, wine, violent bodily exerciſe; it is alſo proper to continue ſtill for ſome time, to waſh or bathe the head in cold water; and ſometimes to take tonic remedies, ſuch as Peruvian bark, acid of vitriol, &c. When the patient, though in other reſpects recovered, ſtill continues to labour under debility or paralyſis of particular parts, theſe complaints may ſometimes be removed by the continued uſe of internal and external tonics and ſtimulants, eſpecially volatile alkali, emetics, bliſters, electricity, &c. But when the ſymptoms increaſe in ſpite of the moſt careful treatment, the ſurgeon is authorized, eſpecially when the diagnoſis is doubtful, to ſuppoſe an extravaſation, and to trepan the part that has been injured. And ſuppoſing even that the ſurgeon has drawn a falſe concluſion, the operation of the trepan, if ſkilfully performed, will do no harm, nay, may even in ſome inſtances be productive of benefit, in conſequence of the diſcharge of blood which it occaſions.

On this important ſubject Mr. Abernethy's obſervations deſerve particular attention. He is of opinion that the effects of concuſſion have not been juſtly deſcribed by authors, nor the ſymptoms related by them thoſe which uſually occur. In his Surgical Eſſays, he, therefore, ſelects two caſes out of many others, in order to ſhew what really are the common conſequences of this injury named concuſſion.

"The whole train of ſymptoms following a concuſſion of the brain," ſays he, "may, I think, be properly divided into three ſtages. The firſt is, that ſtate of inſenſibility and derangement of the bodily powers which immediately ſucceed the accident. While it laſts, the patient ſcarcely feels any injury that may be inflicted on him. His breathing is difficult, but, in general, without ſtertor; his pulſe intermitting, and his extremities cold. But ſuch a ſtate cannot laſt long; it goes off gradually, and is ſucceeded by another, which I conſider as the ſecond ſtage of concuſſion. In this, the pulſe and reſpiration become better, and though not regularly performed, are ſufficient to maintain life, and to diffuſe warmth over the extreme parts of the body. The feeling of the patient is now ſo far reſtored that he is ſenſible if his ſkin be pinched; but he lies ſtupid, and inattentive to ſlight external impreſſions. As the effects of concuſſion diminiſh, he becomes capable of replying to queſtions put to him in a loud tone of voice, eſpecially when they refer to his chief ſuffering at the time, as pain in the head, &c. otherwiſe, he anſwers incoherently, and as if his attention was occupied by ſomething elſe. As long as the ſtupor remains, the inflammation of the brain ſeems to be moderate; but as the former abates, the latter ſeldom fails to increaſe; and this conſtitutes the third ſtage, which is the moſt important of the ſeries of effects proceeding from concuſſion.

"Theſe ſeveral ſtages vary conſiderably in their degree and duration; but more or leſs of each will be found to take place in every inſtance where the brain has been violently ſhaken. Whether they bear any certain proportion to each other or not, I do not know. Indeed this will depend upon ſuch a variety of circumſtances in the conſtitution, the injury, and the after treatment, that it muſt be difficult to determine.

"With regard to the treatment of concuſſion, it would appear, that in the firſt ſtage very little can be done; and perhaps, what little is done, had better be omitted, as the brain and nerves are probably inſenſible to any ſtimulants that can be employed. From a looſe, and, I think, fallacious analogy between the inſenſibility in fainting, and that which occurs in concuſſion, the more powerful ſtimulants, ſuch as wine, brandy, and volatile alkali, are commonly had recourſe to, as ſoon as the patient can be got to ſwallow. The ſame reaſoning which led to the employment of theſe remedies in the firſt ſtage, in order to recal ſenſibility, has given a kind of ſanction to their repetition in the ſecond, with a view to continue and increaſe it.

"But here the practice becomes more pernicious, and leſs defenſible. The circumſtance of the brain having ſo far recovered its powers, as to carry on the animal functions in a degree ſufficient to maintain life, is ſurely a ſtrong argument that it will continue to do ſo, without the aid of means which probably tend to exhauſt parts already weakened by the violent action they induce.

"And it ſeems probable that theſe ſtimulating liquors will aggravate that inflammation which muſt ſooner or later enſue. The acceſs of it, in the caſes which I have related, is ſufficiently evident; and its cure is to be effected by the common methods. The great benefit of evacuations was, in thoſe caſes, very evident."

After ſome further remarks in oppoſition to the cordial plan of treatment, and the relation of a fatal caſe of ſimple concuſſion, in which that ſyſtem would have been manifeſtly hurtful, Mr. Abernethy adverts to the very deſirable object of pointing out the marks by which we may diſtinguiſh between compreſſion and concuſſion of the brain; for theſe, he apprehends, may in general be diſtinguiſhed.

"As far as my obſervation goes," ſays he, "the inſenſibility is much leſs in concuſſion, eſpecially after a ſhort time has elapſed. Patients in this caſe, though they ſeem reluctant to anſwer queſtions, yet complain much if their heads are moved; and in thoſe inſtances where it was judged neceſſary to inſpect the bone, I have generally found they made great complaint during the operation. The pupils alſo are uſually more contracted than in compreſſion of the brain, the muſcles of the limbs retain their natural ſtate of tone, and reſpiration is performed with little or no ſtertor, though the pulſe generally intermits in a very conſiderable degree. In the ſlighter caſes of concuſſion, the ſickneſs of the patient is often very great.

"But, in caſes of compreſſion of the brain, circumſtances very much the reverſe of thoſe juſt related take place; the ſenſibility is much diminiſhed in proportion to the degree of the injury; from this cauſe alſo the pupils are dilated, and the limbs relaxed; the reſpiration is attended with ſtertor; and the pulſe is ſubject to much leſs intermiſſion."

COND, Con, or Conn, in *Sea Language,* ſignifies to guide or conduct a ſhip in her right courſe.

He that conds her, ſtands aloft with a compaſs before him, and gives the word of direction to the man at the helm how he is to ſteer. See Steering.

If the ſhip go before the wind, or, as they call it, betwixt the ſheets, the word is either *ſtarboard,* or *port the helm*; according as the conder would have the helm put to the right or left ſide of the ſhip, upon which the ſhip always goes the contrary way.

If he ſays, *helm a mid ſhip,* he would have the ſhip to go right before the wind, or directly between her two ſheets.

If the ſhip ſail by wind, or on a quarter wind, the word is, *aloof, keep your luff, fall not off, veer no more, keep her to, touch the wind, have a care of the lee-latch:* all which expreſſions are of the ſame import, and imply that the ſteerſman ſhould keep the ſhip near the wind.

On the contrary, if he would have her ſail more large, or more before the wind, the word is, *eaſe the helm, no near, bear up.*

If he cries *ſteady,* it means, keep her from going in and out, or making yaws (as they call it), howſoever ſhe ſails, whether large or before a wind; and when he would have her go juſt as ſhe does, he cries *keep her thus, thus,* &c

CONDA, or Kond, ſignifies fortreſs, and often occurs as a termination of words in the ſouth part of India, in this ſenſe, as *cotta* and *coté,* which have the ſame ſignification, do in the north.

CONDABORA, in *Ancient Geography,* a town of Spain, placed by Ptolemy in Celtiberia.

CONDALIA, in *Botany,* Cavanilles, Icon. tab. 525. Claſs and order, *pentandria monogynia.* Nat. Ord. *rhamni.*

Gen. Ch. *Cal.* one-leafed, with five lanceolate diviſions, permanent. *Cor.* none. *Stam.* five. *Piſt.* Germ ſuperior, egg-ſhaped, ſurrounded by the glandular diſk of the calyx; ſtyle one; ſtigma emarginate. *Peric.* Drupe egg-ſhaped; nut one-celled.

Sp. C. *parvifolia.* A ſhrub. *Branches* numerous, ſpinous. *Leaves* ſmall, egg-ſhaped, acute, cluſtered in the axils of the ſpines. *Flowers* yellowiſh, very ſmall, axillary. Ruiz and Pavon, in their Flora Peruvienſis, have given the ſame name to another genus, conſiſting of ſome herbaceous plants diſcovered by them in Peru. Claſs and order, *tetrandria monogynia.*

Gen. Ch. *Cal.* one-leafed, four-toothed, permanent. *Cor.* monopetalous, funnel-ſhaped; tube inflated; border with four lanceolate diviſions. *Stam.* four, very ſhort. *Piſt.* Germ inferior; ſtyle bifid. *Peric.* Berry egg-ſhaped, crowned by the calyx, hollow, ſpongy, two-celled. *Seeds* ſeveral, attached to a pedicelled receptacle, adnate to the interior of the partition.

CONDALUS, in *Antiquity,* a kind of ring uſually worn by ſlaves.

CONDAMINE, Charles-Marie de la, in *Biography,* a celebrated traveller, was born at Paris in the year 1701. In early life he diſtinguiſhed himſelf as a military man; but quitting the profeſſion of arms for the purpoſe of indulging a laudable curioſity, and a thirſt for natural ſcience, he diligently ſurveyed all the countries bordering on the coaſts of the Mediterranean, and travelled into various parts of Leſſer Aſia, Egypt, and Turkey. He was elected a member of the Academy of Sciences, and propoſed a voyage to the equator, in order to meaſure a degree of the meridian. In 1736 he went, with other mathematicians, to Peru for this purpoſe, and exhibited the greateſt aſſiduity and ſkill in accompliſhing the work. On his return he deſcended the celebrated river of the Amazons; in this enterprize he ſuffered many hardſhips, which were, however, more than requited by the inſtruction, which regions ſo remote, and ſo fruitful of the wonders of nature, afforded him. Here he compared the number of vibrations made by the ſame pendulum, which he had uſed at Paris, at Quito, and other places, and he found that for 100,000 vibrations at Paris, 98,770 were made by the ſame pendulum at the ſide of the Amazons, 98740 at Quito, and 98720 on Pinchincha. He publiſhed in the year 1745 an account of his travels, under the title of "Relation Abrégée d'un Voyage fait dans l'Interieur de l'Amerique Meridionale;" and in 1751, a "Journal du Voyage fait par Ordre du Roi a l'Equateur, avec un Supplement, en deux Parties." Condamine, after a ſhort reſidence at home, went to Italy, where he was honoured with the particular notice of the pope, who granted him a diſpenſation to marry his own niece. In 1762 he publiſhed ſome remarks on what he had ſeen in his tour through Italy. He then viſited England, and, among other intereſting objects, he became warmly attached to the new practice of inoculation for the ſmall-pox. On his return he publiſhed in two volumes "Memoires et Lettres ſur l'Inoculation." About this period he was elected member of the French Academy of Belles Lettres; he likewiſe received the ſame honour from ſeveral foreign learned ſocieties, as thoſe of London, Peterſburgh, Berlin, and Bologna. He died in February 1774, in conſequence of an operation for the hernia. "The acquiſitions of M. de la Condamine," ſays one of his biographers, "were more extenſive than profound; and he poſſeſſed rather an ardour for making reſearches on a variety of ſubjects, than patience completely to inveſtigate any." Nouv. Dict. Hiſt. Gen. Biog. See alſo the article Bouguer.

CONDANORE, in *Geography*, a town of Hindooſtan, in the country of Golconda; 15 coſſes E. of Adoni. N. lat. 15° 40′. E. long. 78°.

CONDAPILLY, a town of Hindooſtan, and capital of a circar of the ſame name, near the bay of Bengal; 142 miles S.E. of Hydrabad. N. lat. 16° 40′. E. long. 80° 4[illegible]′.

Condapilly, a circar of Hindooſtan, bounded on the N.E. by the circar of Ellore, on the S.E. by the bay of Bengal, on the S.W. by the river Kiſtnah, which divides it from Guntoor, and on the N.W. by the country of Golconda; about 60 miles long and 25 broad.

CONDATCHY, a bay of Ceylon in the Eaſt Indies, lying on the weſt ſide of the iſland, ſix miles ſouthward from Arippo, and about 12 miles from Manaar. N. lat. 8° 45′. E. long. 80°. In this bay all the boats are collected for the pearl-fiſhery. The bay forms nearly a half-moon; the beach which ſurrounds it is an extenſive ſandy waſte, with only a few miſerable huts ſcattered along the ſhore between the bay and the woods which ſkirt the beach. Such is the appearance which this bay preſents at moſt ſeaſons of the year; but during the fiſhery the ſcene is entirely reverſed. At that time the bay is crowded with ſmall veſſels, and the beach preſents an aſtoniſhing multitude of people from every quarter of India. The principal bank for the fiſhery is oppoſite to Condatchy, and lies out at ſea about 20 miles. See Pearl-*Fiſhery*.

CONDATE, in *Ancient Geography*, an appellation, probably of Celtic original, bearing relation to the idea of *Confluent*, and giving name to ſeveral towns, ſuch as follow.

Condate, or Redones, *Rennes*, a town of Armorica, the capital of the Redones, according to Ptolemy.—Alſo, *Montreau*, a town of Gaul, between Melodunum and Agedinium, which afterwards bore the name of Monaſteriolum.—Alſo, *Combe*, a place of Gaul between Noviomagus and Durocaſſes.—Alſo, *Cone*, a town of Gaul, between Nevirnum and Brivodurum.—Alſo, *Coignac*, a town of Gaul, between Mediolanum Santonum and Veſunna, according to the table of Peutinger.—Alſo, a place of the iſle of Albion, between Manucium or Mancheſter and Deva or Cheſter in, Antonine's Itinerary: generally placed at Congleton; but Mr. Horſley hath made it very probable that it was ſomewhere near Northwich.

CONDAT-en-Ferrieres, in *Geography*, a town of France, in the department of the Tarn; 10 miles N. of Murat.

CONDATOMAGUS, in *Ancient Geography*, a place of Gaul, marked in the Peutingerian table between Ségodunum and Luteva.

CONDAVIR, in *Geography*, a fortified place of Hindooſtan, and a principal poſt in the circar of Guntoor; ſtrongly ſituated on a mountain, eight coſſes to the weſt of Guntoor, and ten from the bank of the Kiſtnah. Not far from Condavir is Colore, a diamond mine on the ſouthern bank of the Kiſtnah. Condavir is diſtant S.E. from Hydrabad 131 miles; from Madras 276 miles; from Nagpour, S. 385 miles; and N.E. from Seringapatam 414 miles.

CONDE, Lewis I. *De Bourbon*, in *Biography*, was the ſon of Charles of Bourbon, duke of Vendome, and born in 1530. He diſtinguiſhed himſelf when very young at the battle of St. Quintin, and behaved with great gallantry till the death of Henry II., when he became a leader of the Huguenots. He was accuſed of having been the principal contriver of the conſpiracy of Amboiſe, but, in the preſence of the king, he vindicated his honour with all the intrepidity natural to him, and offered to maintain his innocence in ſingle combat againſt his accuſer. He was ſet at liberty, but engaging in another plot, he was condemned by his judges to have his head ſtruck off on a ſcaffold before the king's apartment. To the ſudden death of the ſovereign he was indebted for his freedom a ſecond time; he now openly put himſelf at the head of the Huguenots, and was admitted, with Admiral Coligny, to ſhare their full confidence. After many and very important inſtances of ſucceſs, he was wounded and taken priſoner in the battle of Dreux in 1562. At the battle of Jarnac 1569, he encountered the enemy with his arm in a ſcarf, and as he marched to the attack, the horſe of his brother-in-law reared and broke his leg; ſuperior however to this painful accident, he thus addreſſed his followers: "Nobility of France, know, that the prince of Condé, with an arm in a ſcarf, and broken leg, fears not to give battle, ſince you attend him." The village of Jarnac has been rendered memorable by the courage and conſtancy with which the Huguenots diſputed the day; but their leader Condé, exhauſted with fatigue, was ſurrounded and taken priſoner. Thoſe to whom he had yielded his ſword, had placed him at the foot of a tree, when Monteſquieu, captain of the duke of Anjou's guards, ſhot him dead, in cold blood, in revenge of a private quarrel. This ſavage, and truly infamous deed has affixed an indelible ſtain on the character of the duke of Anjou who was ſuppoſed to have authoriſed it. The body of Condé, thrown upon an aſs, was carried to the caſtle of Jarnac, and after being expoſed to the view of the victorious army, was delivered to the duke of Longueville, his brother-in-law, who cauſed it to be interred with thoſe of his anceſtors at Vendome. In his perſon, the prince of Condé was ungraceful and diminutive, yet his wit and vivacity rendered him a great favourite with the ladies. His amours gave occaſion to the concluſion that he engaged in the cauſe of the Huguenots more as a party-man, than as a religioniſt. This trait in his character was a foil to qualities the moſt ſplendid, and to virtues the moſt heroic. Of high and determined courage, he was formed to ſhine in camps as well as courts, and though his income was narrow, he diſplayed a magnificence of temper worthy his birth and ſtation. Nouv. Hiſt. Dict. Hiſt. de France.

Conde, Lewis II. *de Bourbon*, was born at Paris, Sept. 7, 1621. He was ſtyled Duke d'Enguien, and is known in hiſtory, under the appellation of the *great Condé*. He ſucceeded to the rank of prince by his father's death in 1646. In his infancy he was of an extremely delicate conſtitution, and was ſent into the country for the ſake of pure air. At a proper age the prince took upon himſelf the taſk of governor, and ſelected, as his aſſiſtant, in this important buſineſs, M. de la Bouſſieres, a private gentleman, upon whom he could depend for the moſt exact attention to the orders given him. Two jeſuits were likewiſe aſſigned to him as preceptors, who, with ſome officers of high rank and eminent probity and diſcretion, formed the houſhold of the young prince. With theſe attendants he went to Bourges, where he frequented the college of jeſuits, and became diſtinguiſhed in every branch of learning. His inclination was evidently turned towards the military art, and at the age of eighteen he made a campaign under Marſhal de la Meilleraye, that laid the foundation of that renown by which he was afterwards diſtinguiſhed as the greateſt general of his age. In the year 1643, he was entruſted with the command of the army oppoſed to the Spaniards who had invaded France; by a ſignal victory which he at that time gained, he was looked upon as the guardian genius of his country. So much coolneſs did he diſplay on this occaſion, that on the night preceding the battle, after he had made all the proper diſpoſitions, he ſlept ſo ſoundly that it was neceſſary to awaken him when it was time to begin the attack. He next formed the project of beſieging Thionville, and propoſed the ſcheme to the council of regency, who unwillingly conſented to it. The duke, contrary to expectation, carried it into execution with ſo much ſkill that the town ſoon ſurrendered. After this he was engaged in many combats in Germany, in one of which he threw his general's ſtaff into the enemies trenches, and led on a regiment, ſword in hand, to recover it. The victories of the duke d'Enguien, and his great and growing reputation rendered him an object of jealouſy to Cardinal Mazarin, who did every thing in his power to thwart his ambitious projects. The treachery of the cardinal, and the artifices of the leaders of the country party, excited cabals and troubles, but the duke d'Enguien, who, by the death of his father, had ſucceeded to the title of the prince of Condé, was careſſed by both parties. He at length took part with the court, though he felt it was an ungrateful taſk, and he protected the miniſter without feeling for him the leaſt eſteem.

The royal family left Paris privately, and went to St. Germains, upon which the parliament ſent deputies to learn from the queen the cauſes of her departure; but Mazarin diſmiſſed them contemptuouſly and without an anſwer. Exaſperated at this, the people made a common cauſe, and reſolved to defend themſelves againſt the power of the court. With about 8000 men, the prince of Condé formed a deſign of reducing above 500,000 intrenched behind walls. He had neither money nor magazines; nevertheleſs he triumphed over Paris, and this ſucceſs added not a little to the glory he had already attained. During the ſiege he conſtantly defeated the troops of the malecontents; he prevailed on the army that marched to their aſſiſtance under Turenne, to abandon their general; he ſtopped the progreſs of the duke de Longueville, who had cauſed an inſurrection in Normandy, and got the ſtart of the Spaniards who were advancing to give him battle. Peace was at length concluded, but Condé alone acquired glory by this war, and after the treaty was ſigned, the prince traverſed the ſtreets in his coach alone. All perſons of any rank paid their compliments to him, and he received a vote of thanks from the parliament. The people, however, were uneaſy at the king's abſence, and Condé at length brought the royal family to Paris amidſt the acclamations of the public: for this he was not recompenſed in the manner which he had anticipated; he accordingly united with the malecontents, was arreſted in 1650, and detained a year in priſon. Soon after his liberation, he broke out into open revolt, and a civil war followed which was attended with various ſucceſs. Condé exhibited great proweſs, and ſuſtained his military reputation through the whole of this unhappy warfare, though he was engaged in the ſervice of the Spaniards, the inveterate foes of his country, whom he had formerly obtained ſo much glory in reſiſting. At the peace of the Pyrenees in 1659, the re-eſtabliſhment of the prince of Condé was made a condition. In 1668, he contributed very materially to the conqueſt of Franche-Comté. He took part in the invaſion of Holland in the year 1672, and received a wound at the famous paſſage of the Rhine. He fought the bloody battle of Senef againſt the prince of Orange, in which he had three horſes killed under him, and was anxious to lead to a fourth attack, but as an officer obſerved, "No one but the prince of Condé was deſirous of fighting any longer." After the death of his great rival Turenne in 1675, Condé was ſent to check the progreſs of the imperial army, in Alſace, and diſplayed as much caution in this buſineſs, as he had before exhibited ardour and impetuoſity. By his conſummate prudence and judgment he forced the enemy to croſs the Rhine, and then, full of glory, he reſigned the military profeſſion, and retired to Chantilly, where he ſpent the remainder of his days in cultivating and patronizing letters and the fine arts, to which he had been always attached. During the laſt two years of his life his faculties had ſo much declined, that ſcarcely a trait was left of the *great Condé*. He died in 1686 at Fontainbleau, leaving behind him two ſons, by his wife, the niece of cardinal Richelieu. Nouv. Dict. Hiſt. Hume.

Conde', in *Geography*, a ſmall town of France, in the department of the Aiſne, and chief place of a canton in the diſtrict of Chateau-Thierry, 9 miles S.E. from Chateau-Thierry. The place contains 568 and the canton 9613 inhabitants. The territory includes 235 kiliometres and 27 communes.—Alſo, a fortified town of France, in the department of the North, on the confluence of the Haine and Scheldt, 9 miles N.E. from Valenciennes, known at preſent by the name of Nord Libre, which it took under the republican government of France. After a blockade of nearly four months, it ſurrendered to the Auſtrians on the 11th of July 1793, but was ſoon evacuated. It is the chief place of a canton in the diſtrict of Douay, and contains 5978 inhabitants. The territorial extent comprehends 87½ kiliometres, with 10 communes, and 13,621 inhabitants. Before the revolution of 1789, Condé was a principality from which the princes of Condé derived their title. There are in France ſeveral other ſmall towns of the name of Condé, which ſignifies confluence, from the Latin *condare*, *circumdare*, and means a place built on the ſpot where two rivers meet. See Condate.

Conde' *ſur Noireau*, a town of France, in the department of Calvados, on the river Nireau, or Noireau, chief place of a canton in the diſtrict of Vire, 24 miles S. from Caen, and 150 W. from Paris. The place contains 3030, and the canton 10,681 inhabitants. The territory includes 122½ kiliometres, and 12 communes. The inhabitants carry on a conſiderable trade in cloth, leather, and cutlery.

CONDE' *ſur Iton*, or CONDE' *l'Eveque*, a town of France, in the department of the Eure; 12 miles S.W. of Evreux.

CONDEAU, a town of France, in the department of the Orne, and diſtrict of Belleſme; 10 miles E. of Belleſme.

CONDECEDO, a cape or promontory of North America, in the province of Yucatan; 100 miles W. of Merida. N. lat. 20° 50'. W. long. 91° 27'.

CONDEMNATION, the act of paſſing, or pronouncing SENTENCE, or giving judgment againſt a man; whereby he is ſubjected to ſome penalty or PUNISHMENT; either in reſpect of fortune, reputation, or life.

CONDEMNATION *to the galleys*. See GALLEYS.

CONDEMNATION *of prizes* taken from the enemy. See PRIZE.

CONDENSATION (from *condenſate*, and condenſate from the Latin *condenſatus*), denotes the contraction of a given quantity of matter into a ſmaller ſpace, and in this ſenſe only the word condenſation ought to be uſed; however, in common language, the inſpiſſation, the thickening, or hardening of certain compound ſubſtances, in conſequence of the eſcape of ſome of their component ingredients, is frequently expreſſed by the ſame term; thus the juices of fruit, of plants, of meats, &c. are often ſaid to be condenſated over the fire. Compreſſion and condenſation (though ſometimes uſed the one for the other) differ in this; *viz.* that the former denotes a diminution of bulk, occaſioned by the application of external force; whereas the latter expreſſes the ſame effect, when produced without that external application, as is the caſe with moſt bodies in cooling. But the word condenſation has been more commonly uſed for denoting the converſion of vapour into water, or of vapours in general into liquids.

The particulars which might be noticed with reſpect to condenſation are, the quantity and rate of contraction in different bodies, the cauſes which produce it, and the limits of that contraction. Theſe particulars, however, will, with more propriety, be ſtated under the articles EXPANSION, THERMOMETER, and PYROMETER, which ſee.

Notwithſtanding the above-mentioned definition, it is to be remarked, that in every caſe of condenſation, or of the contraction of a body into a narrower ſpace, the effect is produced by the eſcape of ſomething; and in bodies, which ſeem to be the ſimpleſt in nature, the contraction which they undergo in cooling, is occaſioned by the eſcape of the caloric, which the preſent ſtate of philoſophical knowledge reckons amongſt the elementary ſubſtances. But the reverſe of this propoſition is not always true; *viz.* bodies are not always contracted in their dimenſions when the caloric eſcapes from them; and ſuch has been found to be the caſe with water, with iron, and with ſome other ſubſtances, in certain temperatures. This will be rendered more evident in the ſequel.

Moſt bodies are ſuſceptible of three ſucceſſive ſtates of exiſtence; namely, the ſolid, the liquid, and the elaſtic or vaporous; and all theſe are effected by the introduction of different doſes of caloric. During every one of thoſe ſtates, a different degree of condenſation is produced by the intermediate gradations of temperature; *viz.* ſuch as are not quite ſufficient to induce a different ſtate of exiſtence in the body concerned. Thus, a quantity of the vapour of water, which, at the temperature of 242° (Fahrenheit's thermometer), and under the mean gravity of the atmoſphere, occupies the ſpace of 3600 cubic inches; if it be gradually cooled until the temperature becomes equal to about 212°, its bulk will be contracted ſo as to occupy the half of the ſpace it did before, *viz.* about 1800 cubic inches. If the temperature be lowered below 212°, the vapour will be condenſed into liquid water, which will occupy the ſpace of not more than a ſingle cubic inch. If the cooling be continued, the water will be contracted in its bulk, but not very regularly (that is, the decrements of bulk will not be exactly proportional to the decrements of heat); until the temperature deſcends to about 42°. Below that degree, the water, inſtead of contracting its bulk, is expanded by further cooling; *viz.* by a further abſtraction of caloric. This is a very remarkable property of water, upon which ſome intereſting phenomena of nature are depending. The water, though expanding below the temperature of 42°, ſtill continues fluid as far as about the temperature of 32°; but below this laſt mentioned point, by farther cooling it becomes a ſolid; namely, ice; and in this ſtate water occupies a greater ſpace than it did in a liquid ſtate. (See CONGELATION.) Similar irregularities have been obſerved in the condenſations of ſeveral other bodies, both ſolid and fluid; and it is to be wiſhed that experiments capable of determining the laws of condenſation were inſtituted with all thoſe bodies which are at all ſuſceptible of the trial.

The cauſes of condenſation are by no means thoroughly underſtood. It may ſeem, at firſt ſight, ſufficient to ſay, that ſince caloric is an elementary ſubſtance, which is combined in various proportions with every other known body, the ſeparation of part of that element from the other bodies, naturally enables the particles of the latter to come cloſer to one another in virtue of their mutual attraction. But that this cannot be the ſole cauſe of the condenſation in its whole extent, is eaſily pointed out by the following queries. 1ſt. How are the particles of bodies diſpoſed, that they may be capable of approaching, or of receding from each other? 2dly, Why the degrees, or quantities, of condenſation are not always proportional to the degrees of caloric that are abſtracted from bodies? And, 3dly, Why clouds, fogs, miſts, &c. (which conſiſt of the vapour of water ſuſpended in the atmoſphere) are not always condenſed into liquid water below the temperature of 212°; which is actually the caſe in the atmoſphere?

It has for a long time been an opinion prevalent amongſt philoſophers, that the particles of bodies do not actually touch one another; for otherwiſe it ſeemed impoſſible to comprehend how a body could be expanded and condenſed. But the leaſt conſideration will eaſily ſuggeſt a variety of diſpoſitions of the particles, which, whilſt they actually touch one another, will readily admit of the dilatation and condenſation of the aggregate. Conceive, for inſtance (as profeſſor Prevoſt of Geneva juſtly obſerves), the particles to be elongated, and united at their extremities like the legs of a pair of compaſſes, and they may turn, with regard to this point of union, as a centre, and produce condenſations and dilatations of the whole apparent maſs of the body. A ſponge likewiſe will dilate in water without interrupting the continuity of its parts. One may alſo conceive the particles of bodies arranged in the form of rings; that is, many of them to be in abſolute contact, one with the next, and this with the following, &c., ſo as to form circular or oval rings. With this diſpoſition of particles, the dilatation and condenſation of the aggregate is nothing more than an alteration of the form of thoſe rings; *viz.* they become more like circles when the body is expanded, and more oblong when the body is condenſed; it having been demonſtrated by mathematicians, that the circle comprehends an ampler ſpace than any other figure of the ſame periphery. Though the general diſpoſition of the particles of a body is not known, yet a variety

riety of phenomena clearly indicate that they are not confuſedly placed; but that ſome arrangement, probably a peculiar one, for the particles of each different body, actually takes place; and to this peculiar arrangement ſome of the effects of dilatation and condenſation, at leaſt the irregularities of thoſe alterations, muſt undoubtedly be attributed. Thus the particles of water cryſtallize in freezing; that is, they diſpoſe themſelves with a peculiar regularity, ſomewhat reſembling the filaments of a feather. Theſe filaments of water form angles of about 60 degrees with a larger filament, which is, as it were, the ſtem of the feather; and to this cryſtallization the enlargement of the bulk of water in freezing is with propriety attributed. Such is the force with which the particles of water endeavour to arrange themſelves in that particular order, and of courſe to enlarge the bulk of the aggregate, that ſeveral aſtoniſhing effects are produced by their united efforts. Pieces of timber, ſtones, and other bodies, are burſt by the freezing of incloſed water. Even iron mortar-ſhells, ſuch as are uſed in war, filled with water, and accurately ſtopped, have been burſt by the freezing, and the conſequent enlargement of the incloſed water.

Since the enlargement of the bulk of water commences at about the temperature of 42°, which is 10 degrees above the point of melting ice, commonly called the *freezing point*, which is 32°, it is evident that the particles of water begin to arrange themſelves in a particular order long before the freezing takes place. And, by following the analogy, it may be ſuppoſed, that in every ſtate of exiſtence the particles of bodies have, more or leſs, a tendency to arrange themſelves in a certain order; to which tendency the irregularities in the condenſations of bodies are probably to be attributed.

The above-mentioned particulars, reſpecting the condenſation of water, muſt in great meaſure be underſtood to belong to a great variety of bodies; for all thoſe which have been ſubjected to deciſive experiments have been found to contract or to enlarge their bulk with irregularity, in ſome part at leaſt, if not throughout, the whole ſcale of heat.

The condenſation of vapour in the atmoſphere, which is not always accompanied with a proportionate degree of temperature, forms another difficulty, which the preſent ſtate of philoſophical knowledge is not entirely capable of explaining. We ſhall, however, briefly ſtate certain facts and certain conſiderations, which ought to be kept in view by thoſe who are willing to inveſtigate this intricate and intereſting ſubject. The converſion of water into vapour is attended with an increaſe of its capacity for containing heat, or caloric, and likewiſe with an increaſe of its capacity for containing electric fluid; ſo that if a quantity of water, held in an open and inſulated veſſel, be ſuffered to evaporate, the vapour will deprive the veſſel of part of its heat, and of part of its electric fluid: conſequently, the veſſel will be cooled and electrified negatively. Now that which philoſophers wiſh to aſcertain is, whether the influx of the caloric and of the electric fluid produces the evaporation, or the converſion of the water into vapour draws the caloric and the electric fluid from the contiguous bodies. In the firſt caſe, we ſee no reaſon why the caloric and the electric fluid ſhould ſpontaneouſly quit the contiguous bodies, and run to the water in order to force it to evaporate, becauſe both the water and the contiguous bodies are in an equilibrium; that is, in the ſame ſtate with reſpect to temperature as well as of electricity. In the ſecond caſe, if the influx of heat and of electricity does not force the water to evaporate, what other cauſe can produce that effect?

The ſame reaſoning which has been applied to the converſion of water into vapour, may, *mutatis mutandis*, be adapted to the contrary effect; *viz.* to the condenſation of vapour into water, it being equally difficult to comprehend how the vapour can remain in the elaſtic ſtate, that is, without being converted into water, at a temperature much lower than 212°, which in the atmoſphere is generally the caſe. There is one conſideration, however, which may throw ſome light upon this remarkable phenomenon; *viz.* that in order to depoſit the caloric and the electric fluid, which muſt neceſſarily take place in the condenſation of vapour, there muſt be a body or bodies ready to receive both. But in the atmoſphere, the only body which can receive them is the air, and it is well known, that air is a bad conductor of heat as well as of electricity. The laſt remark which we have to ſubjoin is, that it has been obſerved with ſeveral ſubſtances, and eſpecially with water, that though placed in a colder temperature, they do not part with their caloric ſo eaſily as it might be expected, and this is particularly the caſe when they are to undergo a change in their ſtate of exiſtence; thus water will ſometimes continue fluid when its temperature is 4 or 5 or even more degrees below 32°; though when once formed into ice, this will not melt at a temperature lower than 32°, and yet it will evaporate if expoſed to the air whilſt its temperature is many degrees below 32°.

CONDENSER, from *condenſe*, is an inſtrument capable of collecting, or of drawing into a ſmaller ſpace any ſcattered matter, or quality, or effect. In philoſophy and in mechanics, three different inſtruments have obtained the name of condenſers; *viz.* the *condenſer of air*, the *condenſer of electricity*, and the *condenſer of forces*.

The *condenſer of air*, in pneumatics, is a ſyringe, by means of which a conſiderable quantity of air may be forced into a veſſel fitted for the purpoſe. Fig. 1 and 2, *Plate* XIV. *Pneumatics*, repreſent two conſtructions of this ſort of condenſer, which differ but little from each other. They are generally made of braſs or of iron. A B, *fig* 1, repreſents a cylindrical tube, at moſt, two inches in diameter, and from 8 to 12 inches in length, or even longer. Its flat bottom B is perforated with a hole, on the outſide of which, a valve, (conſiſting of a piece of oil ſilk, or rather of leather, ſtretched over a ſmall flat piece of braſs), is adapted, ſo that if any air be forced from the inſide of the cylinder A B, that fluid will eaſily lift up the valve, and make its exit through the hole at B. But ſhould any ſuction take place within the cylinder A B, the air cannot poſſibly enter through the hole at B, becauſe the valve on the outſide prevents it by ſtopping that hole. The piſton *c d* fits the cavity of the cylinder A B pretty tightly, by means of leathers ſoaked in oil; and it may be moved up or down by the handle E which is faſtened to its rod. This piſton is perforated with a hole *c d*, the lower part of which is furniſhed with a valve *d*, which, when the piſton is drawn upwards, will permit the air to enter the lower cavity of the cylinder; but if the piſton be puſhed downwards, the air which is contained in the lower cavity of the cylinder, cannot paſs through the hole *c d*, on account of the valve at *d*; therefore it will come out through the hole at B. At the extremity of the cylinder, a braſs or iron cap F G is ſcrewed over the valve, allowing however a little room for its free motion. The end G of this cap is perforated quite through, and its outſide is formed into a ſcrew.

Fig. 2 repreſents a condenſing inſtrument ſimpler than the preceding, and ſuch indeed is at preſent moſtly uſed. Neither the cylinder nor the piſton of this inſtrument is furniſhed with any valve. There is a hole through the ſcrew at the bottom B of the cylinder, and a hole at C through its ſide, and at about two or three inches below its upper end; the piſton has no perforation.

When the condenſer, *fig.* 1, is ſcrewed into the aperture of a glaſs or metal veſſel, and the piſton is moved alternately up and down, it will be readily underſtood, that the air will be forced into the veſſel to which the condenſer is adapted; for when the piſton is pulled upwards, that is, towards A, the air cannot enter the cylinder through the hole at B, but it can eaſily paſs through the hole *c d*; and when the piſton is puſhed in, the air which is contained in the cavity of the cylinder, cannot go out of it through the hole *c d*, but it can paſs through the hole at B; hence it is forced to enter the veſſel to which the condenſer is applied. Thus by repeating the movements of the piſton, more and more air is condenſed into the veſſel, until the latter is burſt by the elaſticity of the condenſed air, or the ſame force puſhes ſo hard againſt the valve at B, that the ſtrength of the operator is no longer able to overcome it. The condenſer, *fig.* 2, is uſed exactly in the ſame manner; this, however, muſt be adapted to ſuch veſſels as are furniſhed with a valve within their aperture, which permits the entrance, but not the exit of the air. When the piſton of this condenſer is drawn towards C, a vacuum is formed in the lower part of the cylinder, until the lower part of the piſton is raiſed above the hole C; then the air ruſhes through that hole, and inſtantly fills the cavity, &c.

Theſe inſtruments are generally uſed for condenſing the air into the air-holders of wind-guns, of certain water fountains, and other machines. By this means, the air has ſometimes been condenſed to ſuch a degree, as to become ſix, eight, and even more times, denſer than common atmoſpherical air. The veſſel, in that caſe, is ſaid to contain reſpectively ſix, or eight, or a greater number of atmoſpheres.

In a variety of philoſophical experiments, ſubſtances are frequently placed in a glaſs veſſel in which air is condenſed, in order to obſerve its effects upon the encloſed ſubſtances. For this purpoſe, one of the above-mentioned condenſers is affixed to a frame and apparatus, as is repreſented in *fig.* 3.; and this apparatus, all together, is called a *condenſing engine*.

C D is a braſs condenſer, which is worked by applying the hand to the handle Z of the piſton, and by moving the latter alternately up and down, the air is forced through the braſs pipe D N F into the glaſs receiver A B. This receiver, which muſt be very thick and well annealed, is ſet with its ſmooth and flat edge upon the braſs plate of the machine, which is ſimilar to the plate of an air-pump. A thick piece of braſs L M, is applied in a ſimilar manner to the upper aperture of the glaſs receiver, and a ſlip-wire paſſes through a collar of leathers in this braſs piece. In order to prevent the lifting up of the braſs piece L M from over the glaſs veſſel, or the latter from the plate on the frame of the machine by the force of the condenſed air, two pillars of wood with a croſs piece G H, likewiſe of wood, are annexed, for the purpoſe of keeping down the glaſs veſſel, and the piece of braſs L M. The croſs piece G H is preſſed upon L M by means of the ſcrew-nuts on the pillars I, K. There is a gage E F, annexed to this machine, which indicates the condenſation of the air within the glaſs veſſel, and tube of communication. It conſiſts of a ſtrong and narrow glaſs tube, hermetically cloſed at E, and connected with the braſs tube of communication at F. A ſmall quantity of mercury fills up a ſhort part of the cavity about the middle of the tube, and the ſpace between the mercury and the cloſed end E of the tube, contains air of the uſual atmoſpherical denſity. It is by the contraction of this ſmall quantity of air, that the degree of condenſation in the glaſs receiver is indicated; for in proportion as the air is condenſed into the receiver, or tube of communication, &c., ſo the air between the mercury and the cloſed end of the gage becomes contracted more and more; and the quantity of that contraction is indicated by a ſcale annexed to the glaſs tube; for inſtance, if that air is, by working the machine, compreſſed into the half of the ſpace it occupied at firſt, it ſhews that the air within the receiver is as denſe again as it was before the working of the machine. If the air in the gage is compreſſed into a quarter of its original ſpace, the air within the receiver is ſhewn to be four times as denſe as it was before the working of the machine, and ſo forth; the condenſations in the glaſs receiver being inverſely as the ſpaces occupied by the air in the extremity E of the gage. Theſe degrees of condenſation are commonly expreſſed by ſaying, that *the receiver contains two, or three, or four, or more atmoſpheres,* when the air within it, is twice, or three times, or four times, or more times, denſer than the uſual air of the atmoſphere.

There are certain air-pumps, as thoſe of Smeaton, of Haas and others, the conſtruction of which renders them capable of being uſed for condenſing, as well as for exhauſting the air. See Air-pump. In certain forcing water pumps, in fire engines, and ſome other hydraulic machines, there is a veſſel, in which the air is condenſed by the action of the machine itſelf; the object of which is to produce a conſtant ſtream of water out of the engine, whilſt the piſton of it is moved up and down in the uſual way. This veſſel is called the *air veſſel,* and often the *condenſing-veſſel,* or ſimply the *condenſer.* See Pump, and Fire-*engine.*

The head of an alembic, wherein the vapours are condenſed into a liquid, has ſometimes been called the *condenſer* of the alembic.

Condenser *of Electricity.* This is an inſtrument capable of collecting, or of condenſing into a ſmall ſpace, ſuch quantities of weak and diffuſed electricity, as would otherwiſe remain unperceived, or be inſufficient to affect even the moſt ſenſible electrometer. It was originally invented by a very diſtinguiſhed philoſopher, Mr. Volta of Como, and is by himſelf deſcribed in the 72d vol. of the Philoſophical Tranſactions. But, ſince its original invention, this inſtrument has undergone ſeveral improvements and alterations, which we ſhall now deſcribe, together with their peculiar advantages and defects.

The action of electric atmoſpheres is the principle which ſuggeſted the conſtruction of this moſt uſeful electrical inſtrument. Though the nature of theſe atmoſpheres will be treated of in the article Electricity; it will, nevertheleſs, be neceſſary to give, in this place, ſome idea of their action, by means of an eaſy experiment, in order to render the principle upon which the electrical condenſer acts, manifeſt to the reader. Affix an electrometer of pith-balls to an inſulated metallic plate; that is, a plate of tin or braſs, or other metal, having a glaſs handle. Communicate ſome electricity to it, and obſerve the divergency of the electrometer. In this ſtate, bring the electrified plate near a conductor which is not inſulated, ſuch as the wall of a room or another metallic plate, and you will find that the electrometer collapſes in proportion as the electrified plate comes near to the uninſulated conductor. Remove the electrified plate, and the electrometer will diverge again, nearly as much as it did at firſt; which ſhews, that by the vicinity of the uninſulated conducting body, which could eaſily acquire the contrary electricity, the intenſity of the electricity in the electrified plate was diminiſhed; or, which is the ſame thing, that the capacity of that plate for containing electricity was increaſed. Hence, when an inſulated metallic plate is ſituated near another metallic plate not inſulated, the former will thereby be enabled to abſorb a much greater quantity of electricity than it otherwiſe would, from any ſource whatever; and if the electrified plate be removed from the other, then that abſorbed electricity will be manifeſted by the divergency of the electrometer, or even by affording a ſpark. It naturally follows, that according as the conductor which is oppoſed to the inſulated plate, is nearer to, or farther off, ſo the capacity of the plate will be increaſed more or leſs. Such an inſulated plate, placed upon an imperfectly inſulating, or an imperfectly conducting plane, for the purpoſe of collecting weak and ſcattered electricity, was called a *condenſer* by Mr. Volta. The reaſon of uſing an imperfectly conducting, or imperfectly inſulating plane, is, that when the inſulated condenſing plate is placed upon it, the electricity will not paſs from the latter to the former. In ſhort, the following particulars ſhould be attended to in the conſtruction of this, Mr. Volta's, condenſer. The metal plate ſhould be about ſix inches in diameter, with the edge well rounded, and furniſhed with a varniſhed glaſs handle. The inferior plane muſt be of a very imperfectly conducting nature, ſuch as dry marble, very dry and ſlightly varniſhed wood, a common piece of wood covered with oiled ſilk, or ſuch like ſubſtance; but be its ſubſtance what it may, its ſurface muſt be very ſmooth, and ſuch as to coincide as well as poſſible with the ſurface of the metal plate, *viz.* the receiving plate; on which account, if a marble ſlab be choſen for the inferior plane, it will be proper to fit the ſurface of the metal-receiving plate to that of the marble, by grinding one againſt the other.

The apparatus, conſiſting of the above deſcribed two planes, being properly conſtructed, lay the receiving plate upon the other plane, connect the former with an atmoſpherical conductor, not much elevated above a houſe, or with the vapour of boiling water, or, in ſhort, with any weak ſource of electricity, ſuch as could not be diſcovered by any other means, and after a certain time lift the receiving plate from over the other plane, holding it by the glaſs handle, and preſent it to an electrometer, which will be cauſed to diverge ſufficiently to aſcertain the preſence and the quality of the electricity. Sometimes the receiving plate will even be able to afford a ſpark. Yet, in ſeveral caſes, the receiving plate is electrified ſo ſlightly, as not to occaſion the divergency of the moſt delicate electrometer. A contrivance of Mr. Cavallo, which is deſcribed in his Treatiſe on Electricity, (fourth edition, vol. ii. p. 265) rendered this weak ſtate of electricity capable of affecting the electrometer in a very ſenſible degree. His deſcription of this contrivance is as follows:

" I naturally thought that, for the ſame reaſon which enabled the condenſing plate of Mr. Volta's apparatus, to manifeſt ſuch ſmall degrees of electricity as could not otherwiſe be obſerved, another ſmaller plate, or ſmall condenſing apparatus, might be employed to collect and to render ſenſible the weak electricity of the large metal plate. Accordingly, I conſtructed a ſmall plate of about the ſize of a ſhilling, having a glaſs handle covered with ſealing-wax; and when the large metal plate ſeemed to be electrified ſo weakly as not to affect an electrometer ſenſibly, I placed the ſmall plate upon the inferior plane, and touched it with the edge of the large plate; then, after removing the large plate, I took up the ſmall one from the plane, holding it by the extremity of the glaſs handle, and preſented it to the electrometer, which generally was ſo much affected by it as to diverge to its utmoſt limits.

" In this manner I have often obtained electricity, more than ſufficient to aſcertain its quality, from a ſingle ſtroke of the corner of an handkerchief; *viz.* the large plate being laid upon the proper plane, was ſtroked once with the handkerchief; then, being removed and preſented to an electrometer, it appeared not electrified; but by touching the ſmall plate with the edge of it, that ſmall plate acquired thereby electricity ſufficient to make an electrometer diverge."

With this condenſing apparatus Mr. Volta, and other philoſophers, made ſeveral diſcoveries; yet the uſe of it was not always attended with the deſired effect, which was principally owing to the changeable nature of the ſemiconducting plane, upon which the receiving plate was placed; it being difficult to obtain, and much more difficult to preſerve, ſuch plane in a middling or ſemiconducting ſtate; for ſometimes it would carry off the electricity from the ſuperimpoſed receiving plate, and at other times it was not of a conducting nature ſufficient to enable the upper plate to condenſe the electricity. It, likewiſe, often happened that this plane would acquire ſome electricity either in conſequence of the ſlighteſt friction, or by communication, which rendered the action of the upper plate quite equivocal. With a view to remove theſe inconveniences Mr. Cavallo contrived an inſtrument capable of anſwering the ſame purpoſe, but quite free from all the above-mentioned objections. The principle of this inſtrument is like that of Mr. Volta's condenſer; excepting that the receiving plate does not touch the other plane, though it comes very near it, and it likewiſe oppoſes another plane to the other ſide of the receiving plate. Thoſe planes are of metal, and by their not touching the receiving plate, enable the latter to act with certainty and without obſtruction. Upon this principle, *viz.* of the two plates not actually touching, but approaching one another very nearly, the preſent electrical condenſers are conſtructed, however they may have been varied in ſize, in name, and in ſhape. By the aid of theſe condenſers various important diſcoveries have been made in electricity, and eſpecially in that branch of it, which is called galvaniſm. The original deſcription of this inſtrument of Mr. Cavallo, is in the 78th. vol. of the Philoſophical Tranſactions, for the year 1788, from which we make the following extracts.

" The properties of this machine, which from its office may be called *a collector of electricity*, are firſt; that when connected with the atmoſphere, the rain, or in ſhort with any body which produces electricity ſlowly, or which contains that power in a very rarefied manner, it collects the electricity, and afterwards renders both the preſence and quality of it manifeſt by communicating it to an electrometer. Secondly, this collecting power, by increaſing the ſize of the inſtrument and eſpecially by uſing a ſecond or ſmaller inſtrument of the like ſort to collect the electricity from the former, may be augmented to any degree. Thirdly, it is conſtructed, managed, and preſerved with eaſe and certainty; and it never gives, nor can it give, an equivocal reſult, as I have proved experimentally, and as will appear by conſidering its conſtruction."

" The figures 4 and 5, *Plate*, II. *Electricity*, exhibit this inſtrument, *viz. fig.* 4 ſhews the inſtrument in the ſtate of collecting the electricity, and *fig.* 5 ſhews it in the ſtate in which the collected electricity is to be rendered manifeſt. An electrometer is annexed. The letters of reference indicate the ſame parts in both figures. A B C D is a flat tin plate, thirteen inches long and eight inches broad; to the two ſhorter ſides of which are ſoldered two tin tubes, A D and B C, which are open at both ends. D E and E F, are two glaſs ſticks covered with ſealing wax by means of heat, and not by diſſolving the ſealing wax in ſpirits. They are cemented in the lower apertures of the tin tubes, and alſo in the wooden bottom of the frame or machine, at E and F, ſo that the tin plate, ABCD, is ſupported by thoſe glaſs ſticks in a vertical poſition, and is exceedingly well inſulated. GHILKM and NOPV, are two frames of wood, which being faſtened to the bottom boards, by means of braſs hinges, may be placed ſo as to ſtand in an upright poſition and parallel to the tin plate, as ſhewn in *fig.* 4. or they may be opened, and laid upon the table which ſupports the inſtrument, as ſhewn in *fig.* 5. The inward ſurfaces of thoſe frames from their middle upwards are covered with gilt paper, X, Y; but it would be better to cover them with tin plates, hammered very flat. When the lateral frames ſtand ſtraight up, they do not touch the tin plate; but they ſtand at about one-fifth part of an inch aſunder. They are alſo a little ſhorter than the tin plate, in order that they may not touch the tin tubes, AD, BC. In the middle of the upper part of each lateral frame is a ſmall flat piece of wood, S and T, with a braſs hook; the uſe of which is to hold up the frames without the danger of their falling down when not required, and at the ſame time it prevents their coming nearer to the tin plate than the proper limits. It is evident that when the inſtrument ſtands as ſhewn in *fig.* 4, the gilt ſurface of the paper, X, Y, which covers the inſide of the lateral frames ſtands contiguous and parallel to the tin plate."

" When the inſtrument is to be uſed, it muſt be placed upon a window, a table, or other convenient ſupport, a bottle electrometer is placed near it, and is connected, by means of a wire, with one of the tin tubes, AD, BC; and by another conducting communication the tin plate muſt be connected with the electrified ſubſtance, the electricity of which is required to be collected on the plate, ABCD: thus, for inſtance, if it be required to collect the electricity of the rain, or of the air, the inſtrument being placed near a window, a long wire muſt be put with one extremity into the aperture, A or B, of one of the tin tubes, and with the other extremity projecting out of the window. If it be required to collect the electricity produced by evaporation, a ſmall tin pan, having a wire or foot of about ſix inches in length, muſt be put upon one of the tin tubes; ſo that the pan may ſtand about two or three inches above the inſtrument. A lighted coal is then put into the pan, and a few drops of water poured upon it, will produce the deſired effect."

"The quantity of electricity, which the tin plate, ABCD, is capable of collecting, principally depends on three circumſtances, *viz.* 1ſt. On the diſtance between the tin-plate and the conducting lateral ſurfaces: the ſmaller that diſtance is, the greater being the collecting power; 2dly. On the ſize of the inſtrument; and 3dly, On the quantity of electricity poſſeſſed by the body from which it muſt be collected or taken away."

" I need not expatiate on the principle upon which the action of this inſtrument depends; this being the ſame as that of the electrophorus of Mr. Volta's condenſer, and of many other electrical experiments; namely, that a body has a much greater capacity for holding electricity, when its ſurface is contiguous to a conductor which can eaſily acquire the contrary electricity, than when it ſtands not in that ſituation."

Though this original condenſer, which, by way of diſtinction, its inventor called a collector, anſwers the purpoſe for which it was intended perfectly well; yet for the common run of experiments, its ſize may be diſpenſed with, as it takes up too much room on the table of an electrician. On this account, not only the ſize of the inſtrument has been reduced, but its ſhape alſo has been varied according to the fancy of almoſt every philoſophical inſtrument maker. For the ſake of ſimplification in the condenſers which are at preſent in general uſe, one conducting plane only is oppoſed to the receiving plate, which anſwers the purpoſe ſufficiently well; for if the electricity collected by the receiving plate happens to be too weak to affect the electrometer, a ſmaller condenſer may be uſed, which will condenſe the electricity of the former, &c.

The forms of the condenſers that are moſtly uſed at preſent, are repreſented in *figs.* 6, 7, 8, and 9. *Fig.* 6 exhibits a vertical ſection of the condenſer conſtructed by Mr. John Read of Knights-bridge; *a a* is a circular flat plate of braſs, about eight inches in diameter, ſtanding inſulated, by means of the glaſs ſtick *f*, on the wooden foot *g*; *gh* is a hollow braſs cylinder, terminating in the hollow braſs cone *e c d h*; and to this cone the flat perforated braſs plate *b c c b* is affixed. The glaſs ſtick *f*, which, by means of a braſs ferril, is faſtened to the plate *a a*, has its lower extremity cemented in a cylindrical piece of wood, and this piece of wood is fixed in the bottom *g*. Now it will be eaſily perceived, by inſpecting the figure, that the hollow cylinder *hg* may be moved up or down by ſliding it upon the cylindrical piece of wood; and that, by ſo doing, the plate *bccb* may be brought near to, or removed from the plate *a a*, which is the receiving plate of this condenſer; *i* is a milled-head ſcrew, which ſerves to fix the plate *bb* at a proper diſtance from *a a*, where a ſtop is made for that purpoſe; when *i* is looſened, the plate *bb*, with *c h g*, which is all one piece, falls in the ſituation repreſented in the figure, and in that ſtate an electrometer is put in contact with the plate *a a*, in order to manifeſt the electricity which *a a* condenſed whilſt *b c c b* ſtood near it.

Fig. 7 repreſents a condenſer of another form, as made by Mr. Cuthbertſon. This ſort of condenſer is both ſimple in its conſtruction, and commodious in practice; *a b* is a braſs plate of about 8 inches in diameter (the inſtrument being ſhewn in profile), which is ſcrewed tight into the wooden head *c*, which is cemented on the glaſs ſtick *d*, and this is cemented with its lower extremity into the wooden ſtand *e e* of the inſtrument; *f i* is a ſimilar plate of braſs, faſtened to the braſs head and pillar *g i*, the lower part of which turns round a pin at *h*, ſo that it may either ſtand upright, or it may be inclined after the manner of the dotted repreſentation *h m*. It is almoſt ſuperfluous to add, that *a b* is the receiving plate of this condenſer. *Fig.* 8 ſhews a front view of a condenſer of this ſort, placed cloſe to a gold leaf electrometer, furniſhed with a ſmaller condenſer, *viz.* ſuch as is repreſented by itſelf in *fig.* 9. The ſmall condenſer, *fig.* 9, is ſimilar to the one repreſented in *fig.* 7; ſaving that in *fig.* 9 the receiving plate is affixed to the cap of a gold-leaf electrometer; ſo that this apparatus, *viz. fig.* 9, may be uſed by itſelf in moſt experiments; but in certain caſes it will be neceſſary to employ the condenſer *fig.* 7 firſt, and afterwards the electricity may be farther condenſed by means of the apparatus *fig.* 9, as ſhewn in *fig.* 8.

There is an inſtrument contrived by Mr. Wilſon, which he calls " a compound electrical inſtrument for condenſing and doubling." But as the conſtruction, as well as the principal uſe, of that inſtrument properly belongs to another claſs of electrical inſtruments, its deſcription will be found in another part of this work. See DOUBLER, and MULTIPLIER *of electricity*.

CONDENSER *of forces*. This name was given by Mr. R. Prony to a contrivance for obtaining the greateſt poſſible effect from a firſt mover, the energy of which is ſubject to augmentation or diminution within certain limits; and in general to vary at pleaſure the reſiſtance to which the effort of the firſt mover forms an equilibrium in any machine whatever, without changing any part of their conſtruction. (Bulletin of the Philomathic Society at Paris, No. 83.)

The general problem in mechanics, of which this condenſer is intended as a practical ſolution, is enunciated by Mr. Prony in the following terms:

"Any machine being conſtructed, to find, without making any change in the conſtruction, a means of tranſmitting to it the action of the firſt mover, by fulfilling the following conditions; *viz.*"

"1. That it may be poſſible at pleaſure, and with great ſpeed and facility, to vary the reſiſtance (againſt which the effort of the firſt mover muſt continually make an equilibrium) in limits of any required extent."

"2. That the reſiſtance, being once regulated, ſhall be rigorouſly conſtant until the moment when it is thought proper to increaſe or diminiſh the ſame."

"3. That in the moſt ſudden variations of which the effort of the firſt mover may be capable, the variation in velocity of the machine ſhall never undergo a ſolution of continuity."

Mr. Prony applies this ſolution of this problem to the dynamic effect of wind; but it will be eaſy to make the ſame general, when other firſt movers are uſed. *Fig.* 10 (*Plate* XVI. *Mechanics*) repreſents the plan, and *fig.* 11 the elevation of the machine. O O is the vertical arbor to which windmill-ſails are adapted; *e e e e* is an aſſemblage of carpentry, of which one of the radii, O *e*, bears a curved piece, *b d*, of iron or ſteel: vertical axes of rotation *a a a*, being placed round the axis OO; they alſo divide the circumference in which they are found, into equal parts. Each of theſe axes carries a curve *a f*, of iron, ſteel, or copper; ſo ſituated, that when the wind acts upon the ſails, the curve *b d* preſſes againſt one of the curves *a f*, and cauſes the vertical axis to which this laſt curve is affixed, to make a portion of a revolution. The curves *b d*, and *a f*, muſt be ſo diſpoſed, that when *b d* ceaſes to preſs on one of the curves *a f*, it ſhall at the ſame inſtant begin to act upon the following curve: the number of axes which are provided with theſe curves, muſt be determined by the particular circumſtances of each caſe, and it is alſo practicable to ſubſtitute, inſtead of *b d*, a portion of a toothed wheel having its centre in the axis OO, and to place portions of pinions inſtead of the curves *a f*; but the diſpoſitions repreſented in the figure are preferable. Each of the axes *a a a a* (which are all fitted up alike, though, for the ſake of clearneſs, only one of them has its apparatus repreſented in the drawing), carries upon it a drum or pulley, *t t r r*, on which is wound a cord that paſſes over a pulley *p*, and ſerves to ſupport a weight Q, by means of the lever F G, upon which this weight may be ſlided and faſtened at different diſtances from the point of motion G. The ſame axes, *a*, *a*, paſs through the pinions *q*, *q*, to which they are not fixed; but theſe pinions carry clicks or ratchets, which bear againſt *r r*; ſo that when the weight Q tends to riſe, the ratchet gives way, and no other effect is produced on the pinion *q q*, either by the motion of the axis or of the drum *t t r r*, excepting that which cauſes the aſcent of the weight *q q*. But the inſtant that the curve, or tooth *b d*, ceaſes to bear againſt one of the curves *a f*, after having cauſed the correſponding weight Q to riſe, that weight Q tends to re-deſcend, and then the toothed wheel *r r* acts againſt the ratchet, ſo that Q cannot deſcend without turning the pinion *q q* along with the drum *t t r r*. The pinion *q q* takes in the wheel *a b*, from the motion of which the uſeful effect of the machine immediately reſults; ſo that the effect of the deſcent of one of the weights Q is to ſolicit the wheel A B to motion, or to continue the motion in concurrence with all the other weights Q, which deſcend at the ſame time. This wheel, A B, carries beneath it oblique or bevelled teeth, G D, which take in a like wheel, C E, and cauſe the buckets at S to riſe.

From the preceding deſcription, it is ſeen that the machine being ſuppoſed to ſtart from a ſtate of repoſe, the wind will at firſt raiſe a number of weights, Q, ſufficient to put the machine into motion, and will continue to raiſe new weights, whilſt thoſe before raiſed are fallen, ſo that the motion once impreſſed will be continued.

Among the numerous advantages of this new mechaniſm, the following may be remarked:

1. No violent ſhock can take place in any part of the mechaniſm. 2. The uſeful effect being proportioned to the number of weights Q, which deſcend at the ſame time, this effect will increaſe in proportion as the wind becomes ſtronger, and cauſes the ſails to turn with greater velocity. 3. The weights, Q, being moveable along the levers F G, it will always be very eaſy to place them in ſuch a manner as to obtain that ratio of the effort of the firſt mover to the reſiſtance, which will produce the maximum of effect. 4. From this property it reſults, that advantage may be taken of the weakeſt breezes of wind, and to obtain a certain product in circumſtances under which all other windmills are in a ſtate of abſolute inactivity. This advantage is of great importance, particularly with regard to agriculture: the windmills employed for watering lands, are ſometimes inactive for ſeveral days, and this inconvenience is more particularly felt in times of drought. A machine capable of moving with the ſlighteſt breeze, muſt, therefore, offer the moſt valuable advantages.

CONDENSING OF WINES. See WINES.

CONDEON, in *Geography*, a town of France, in the department of the Charente; 25 miles S.E. of Saintes.

CONDER, a river of England, in the county of Lancaſter, which runs into the Iriſh ſea; 3 miles S. of Lancaſter.

CONDERCUM, in *Ancient Geography*, a ſtation of Britain on the line of Severus's wall at Benwell-hill, where the prefect of the firſt wing of the Aſti was placed. Not. Imp.

CONDERS, from the Fr. *Conduire*, to conduct, perſons who were employed in the fiſhery to give notice where ſhoals of herrings were paſſing; otherwiſe called *Balkers*; which ſee.

CONDESCENSION, in *Ethics*, denotes that ſpecies of benevolence, which deſignedly diſregards the ſuppoſed advantages of birth, title, or ſtation, in order to accommodate itſelf to the ſtate of an inferior, and diminiſh the reſtraint which the apparent diſtance is calculated to produce. Accordingly, it greatly enhances the value of every other ſpecies of benevolence.

CONDESUYOS DE AREQUIPA, in *Geography*, a juriſdiction of South America, under the biſhop of Arequipa, 30 leagues diſtant from that city; which extends about 30 leagues, with different temperatures of the air, and conſequently produces grains and fruits. In this juriſdiction is bred the wild cochineal, with which the Indians carry on a kind of trade with the provinces in which the woollen manufactures flouriſh. They firſt pulverize the cochineal by grinding it, and after mixing four ounces of it with twelve of violet maize, they form it into ſquare cakes called “mango,” each weighing four ounces, and ſell it for a dollar per pound. This country abounds in gold and ſilver mines, which have of late been much neglected.

CONDETTA, a town of France, in the department of the ſtraits of Calais, and diſtrict of Boulogne; 1½ league S. of Boulogne.

CONDICA, in *Ancient Geography*, a town of Aſia Minor, in Lycia, and in the country called Mylas, according to Ptolemy.

CONDIGNITY, Merit of, in *Theology*. See Merit.

CONDIGRAMMA, in *Ancient Geography*, a ſmall town of Aſia, on this ſide the mouth of the Indus, upon the coaſt of Gedroſia, according to Pliny.

CONDILLAC, Stephen Bonnet de, in *Biography*, a French metaphyſician, member of the Academy, and preceptor to the infant Don Ferdinand, prince of Parma, an honour to which he arrived from the high reputation that he had gained from his writings. The work by which he was firſt known was an “Eſſay on the Origin of Human Knowledge,” in 2 vols. publiſhed in 1746; in which he endeavours to develope the faculties of the mind, by giving a ſort of hiſtorical account of its ſeveral functions. In 1754, he gave to the world a “Treatiſe on Senſations,” in 2 vols. 12mo.: here he conſiders what would be the conceptions of a ſtatue, provided at firſt with a ſingle ſenſe, and ſucceſſively with the others; and hence he undertakes to account for the origin of memory, judgment, and the mental affections, and the gradual formation and correction of ſenſible ideas. In the courſe of the following year he publiſhed a “Treatiſe on Animals;” in which he refutes the notions of Deſcartes and Buffon concerning the merely mechanical nature of brutes, and ſhews in what manner their faculties are acquired. In 1776 his great work, entitled, “A Courſe of Study drawn up for the Inſtruction of the Prince of Parma,” was publiſhed in 16 vols. 12mo. As an introduction to theſe volumes, we have a diſcourſe on the different modes of communicating inſtruction; giving a decided preference to the gradual advance from particular facts up to general principles, inſtead of the contrary method. Metaphyſical lectures, logic, and the philoſophy of the human mind, are among the earlier parts of this courſe of ſtudy; and from theſe, as preliminary ſteps, he proceeds to the ſtudy of hiſtory, of which he has given an ample and well-arranged abridgment, in eleven volumes. As an appendix, is added a volume conſiſting chiefly of political reflections. This ingenious writer publiſhed alſo a ſmall work, entitled, “Commerce and Government conſidered relatively to each other.” In all his works he exhibits an extenſive knowledge, a mind well imbued with the principles of humanity, and with the moſt liberal notions of government. He died in the year 1780, highly reſpected by his countrymen, and characterized for the ſoundneſs of his judgment, for the clearneſs of his ideas on every ſubject which he undertook to diſcuſs, and for his general knowledge in almoſt every department of literature. Nouv. Dict. Hiſt.

CONDITION, in the *Civil Law*, an article of a treaty, or contract; or a clauſe, charge, or obligation, ſtipulated in a contract, or added in a donation, legacy, teſtament, &c.

The donee does not loſe his donative, if it be charged with any diſhoneſt or impoſſible conditions. Lawyers diſtinguiſh three kinds of conditions, under which a legacy or donation may be made: theſe are the *caſual*, which depends merely on chance; the *poteſtative*, which is abſolutely in our power; and the *mixed condition*, which is both caſual and poteſtative together.

Condition, in *Common Law*, is a manner, quality, or reſtriction, annexed to an act; qualifying or ſuſpending the ſame; and making it precarious and uncertain, whether or not it ſhall take effect.

Accordingly, it is defined to be what is referred to an uncertain chance, which may or may not happen. Or, condition is a modus, or quality, annexed by him that hath eſtate, intereſt, or right to the land, &c. whereby an eſtate, &c. may be either created, defeated, or enlarged upon an uncertain event: and it differs from a *limitation* (which ſee), which marks the bounds or compaſs of an eſtate, or the time how long the eſtate ſhall continue.

A condition is alſo conſidered as one of the terms upon which a grant may be made; and in this ſenſe a *condition in a deed* is a clauſe of contingency, on the happening of which the eſtate granted may be defeated; as “provided always, that if the mortgager ſhall pay the mortgagee 500*l.* upon ſuch a day, the whole eſtate granted ſhall determine;” and the like.

Of conditions there are various kinds; *viz.* conditions in deed or expreſs, and in law or implied; conditions precedent and ſubſequent; conditions inherent, and collateral, &c.

Condition *in deed*, or *expreſs*, is annexed by expreſs words to the feoffment, leaſe, or grant, either in writing, or without. As, if a man make a leaſe of lands to another, reſerving a rent to be paid at ſuch a feaſt; *upon condition*, if the leſſee fail in payment, it ſhall be lawful for the leſſor to re-enter.

Condition *implied*, called alſo *condition in law*, is when a man grants to another the office of a ſteward, bailiff, keeper of a park, &c. for life: though there be no condition expreſſed in the grant, yet the law makes one covertly; which is, that if the grantee do not juſtly execute all things belonging to the office, it ſhall be lawful for the grantor to diſcharge him.

Condition *precedent*, is when a leaſe or eſtate is granted to a perſon for life, upon condition of the payment of a certain ſum by the leſſee to the leſſor at a certain day, when he ſhall have fee-ſimple: in this caſe the condition precedes the eſtate in fee, and on performance gains the fee ſimple.

Condition *ſubſequent*, is when a man grants to another his manor in fee, upon condition that the grantee ſhall pay to him a certain ſum on ſuch a day, or that his eſtate ſhall ceaſe: ſo that here the condition follows the eſtate, and the performance preſerves it. From theſe definitions it appears, that a *condition precedent* gets or gains the thing or eſtate made upon condition by the performance of it; and that a *condition ſubſequent* keeps and continues the eſtate by the performance of the condition. If one agree with another to do ſuch an act, and for the doing of it the other ſhall pay ſo much money; here the doing of the act is a *condition precedent* to the payment of the money, and the party ſhall not be compelled to pay till the act is done; but when a day is appointed for the payment of money, which day happens before the thing contracted for can be performed, there the money may be recovered before the thing is done; for here it appears, that the party did not intend to make the performance of the thing a *condition precedent*. For a further account of theſe conditions, ſee the article Estate *upon condition*. There are other *conditions*, beſides thoſe already mentioned: ſuch are conditions *inherent*, being ſuch as deſcend to the heir with the land granted; and *collateral condition*, being that which is annexed to any collateral act. Conditions are likewiſe *affirmative*, which conſiſt of doing; *negative*, which conſiſt of not doing:

ſome are ſaid to be *reſtrictive*, for not doing a thing, and ſome *compulſory*, as that the leſſee ſhall pay the rent, &c. Some conditions are *ſingle*, to do one thing only; ſome *copulative*, to do divers things; and others *disjunctive*, where one thing of ſeveral is required to be done. Co. Litt. 201.

CONDITIONS *in reſtraint of Marriage*, have not been generally favoured, as contrary to ſound policy; but where a legacy hath been given over to another, the condition has been held valid; and it ſeems, that ſuch conditions as only reaſonably reſtrain children from imprudent marriage will be always ſupported:—that is, when they operate only as particular, not as univerſal reſtrictions. Where a legacy is given on conſideration that the legatee ſhould not marry without conſent, and there is no deviſe over, the condition is void. 4 Burr. 2055. Com. Rep. 739. The rule of the eccleſiaſtical law is, that where a portion is given in conſideration that the daughter ſhould never marry, the condition is void. As the intent of the teſtator chiefly governs in wills, ſuch conſtruction is always made of the words, as will beſt ſupport his intent; and therefore theſe words *ad faciendum*, *faciendo*, *ea intentione*, *ad effectum*, &c. in a will create a condition. Co. Litt. 204. *a*. A grant to one to the intent he ſhall do ſo and ſo, is no condition, but a truſt and confidence. Some words in a leaſe do not make a condition but a covenant, upon which the leſſor may bring his action. A covenant not to grant, ſell, &c. may be a condition; and covenant, that, paying the rent, the leſſor ſhall enjoy the land, is conditional. 2 Danv. 2. 6. Where words are indefinite, and proper to defeat an eſtate, they ſhall be taken to have the force of a condition. Palm. 503. For the performance of conditions and relief againſt the breach of them, ſee Jacob's Dict. by Tomlins, art. CONDITION.

CONDITION of a *Bond*. See BOND.

CONDITION *without which*, *ſine qua non*, is uſed in *Philoſophy*, in ſpeaking of ſome accident or circumſtance, which is not eſſential to the thing, but is yet neceſſary to its production. Thus, light is a condition without which a man cannot ſee objects, though he have good eyes; and thus fire, though conſidered in itſelf, may burn without wood; yet is its preſence a condition without which the wood cannot be burnt.

CONDITION, *applied to Horſes*, is uſed to ſignify that a horſe is well fed and of good appearance; it alſo has another ſignification, that of his being brought by ſuitable treatment into a ſtate of body, that gives him the fulleſt uſe of all his faculties in performing any very difficult or arduous exertion or exerciſe, as for hunting, racing, trotting, or the arts of the manege.

A horſe that is moderately fat may be ſaid to be in good condition, and ſo he is for ſale, or for ſlow heavy draught-ſervice; but ſuch a one would be totally out of condition for any of the above exerciſes. To condition a horſe for theſe a proper ſhare of clean nouriſhing food and exerciſe is neceſſary, as much only as would confer the utmoſt point of ſtrength and power, without adding any uſeleſs incumbrance of matter to the body that might clog the freedom of reſpiration, or increaſe the weight and bulk of the animal, and impede rather than aſſiſt the functions of the organs, viſcera, and limbs. This art, if properly underſtood, ſhould impart the greateſt facility of wind, and join to lightneſs of the body the greateſt poſſible elaſticity and ſtrength of the muſcular ſyſtem. Such is properly the art of *training*, to which we refer the reader, and in which, though great things have been done, more wonderful might be yet effected; if to a well-founded view of nature in theſe animals was added all that conſummate and well-placed art could bring to her aſſiſtance, for nature we are led to believe has been but too often thwarted inſtead of aſſiſted by the arts of ſtable-men, jockies, and ſmiths.

Though mere practice alone will teach much, yet when combined with a juſt ſyſtem or knowledge of cauſe and effect, the art, whatever it be, may be carried to much higher perfection than it can otherwiſe.

For the preſent, we only treat of condition in horſes, for the common and ordinary purpoſes to which they are applied.

To ſtable ſervants is left in general the phyſicking, dieting, and conditioning the horſe; and a myſtery has often, with the ignorant, more charms than the clear face of truth herſelf. The effects of drugs upon horſes are very little known, perhaps, except the purgative effect of aloes, and the diuretic effect of ſoaps and turpentines, and neutral ſalts; we have ſcarcely any medicine whoſe effects we really know upon the horſe, or that appears at preſent likely to be known, yet are grooms ever phyſicking their horſes with ſome drugs or other; good clean food in plenty, dry lofty ſtables, gentle exerciſe, and attention to the ſkin in keeping it clean, will bring almoſt any horſe that is out of condition into condition, unleſs there be ſome lurking diſeaſe; yet nauſeous drugs are added to their food, and they are pleaſed to fancy that the effects they experience reſult from theſe, though it is more probable, as far as they go, and in the uncertain and often idle doſes in which they are exhibited, that they prevent, rather than aſſiſt, the purpoſe they have in view, and rather diſturb their digeſtion, and weaken the ſtomach, than aſſiſt it; or more certainly render nauſeous and loathſome the food they could otherwiſe reliſh; antimony, nitre, brimſtone, elecampane root, &c. are among their ſecrets for this purpoſe. Antimony is, however, believed, by better judges than theſe, to affect the ſkin of the horſe, and promote perſpiration; this it may poſſibly do. We may, however, juſt remark, that where it affects the ſkin, it has the power of affecting the ſtomach; but with pigs, horſes, and a variety of other animals, it does not affect the one, and one ſhould doubt whether, in theſe caſes, it would affect the other; for in no quantity whatever, and we have given 4 oz. at a doſe, does it appear to affect the ſtomach; nitre in larger quantities than they are uſed to give, will increaſe the urine; but how this promotes condition, we have not yet been informed. The reſt of their noſtrums are obviouſly inert, at leaſt their actual effects, when puſhed, till they become externally ſenſible, have never been exhibited; and unleſs they are, we cannot know them. There is, however, another, and a more certain purpoſe anſwered, in the adminiſtration of their drugs, and to which the ſcience of medicine, in ignorant hands, is but too frequently made ſubſervient; and without which, we believe, there would not be ſo much anxiety about the adminiſtration of them.

There is one inſtance, however, in which we rejoice to have it in our power to concur with theſe men in the uſe of medicine, and that is on horſes coming from graſs; this appears to be a really uſeful practice, and we think, from ſufficient experience, we can vouch for the fact, though to give medicines without a direct indication for their uſe, would at firſt appear repugnant to reaſon, yet it is uſual with grooms to give one, two, or more doſes of phyſic, on the horſe being brought from graſs "to clear him out," as they ſay; but if ſuch were the only effect, there would be no occaſion for it, as the graſs would very naturally come away from him without its good effects: we ſhall give a different account of the ſudden change of life, from green relaxing watery food, as graſs, to dry hay and ſtimulating corn; from free open air and nightly dews, and all kinds of weather, to a cloſe, low, foul, and crowded ſtable, the air of which is heated to an exceſs, and filled with ſtimulating exhalations from the dung; the water which had been received in quantities unreſtrained, is now portioned out (though it is really more neceſſary) in miſerable pittances. The body, before expoſed, is wrapped in rugs and cloths, and the whole ſyſtem becomes heated and inflamed by the ſudden changes, inflammatory complaints of the lungs, eyes, palate, throat, inteſtines and feet, are produced; and it is therefore uſeful on this account, in keeping off theſe attacks, to lower the habit by phyſic, after the horſe has been a few days in the ſtable, and to paſs by ſlow degrees to the exceſſive uſe of theſe vigorous ſtimuli. Dealers like to mix carrots with their corn, and bleed occaſionally, and give bran maſhes, which has the ſame effect.

In turning out alſo, grooms are again for phyſicking their horſes, and under the ſame pretence of clearing them out, and preparing them for graſs. They will, however, be ſufficiently lowered and reduced by the graſs itſelf, without any additional reduction by phyſic. It may not be an uſeleſs precaution, however, to withdraw by degrees the uſe of corn, previous to turning out, and the removing all ſort of clothing, to give water in greater abundance, that the change may not be too ſuddenly felt, and bring on broken wind, farcy, and the diſeaſes induced by too great debility.

In Arabia, where the fineſt horſes of the world are produced, a late traveller in thoſe countries, (Mr. Barker), informs us of the extraordinary ſimplicity of their treatment of them. They do not uſe any inſtrument for dreſſing or cleaning them. They merely faſten them to a picket by the leg or a halter, to give them their food, which, during the ſpring, conſiſts only of graſs; and when the earth no longer produces that nutriment, they ſupply the want by camel's milk, which, he ſays, is moſt aſſuredly preferable to any kind of grain.

Beans, malt, oats, clover, hay, and meadow hay, are the general food of horſes in England, and are ſuppoſed to be ſtimulant or invigorating to the ſyſtem of the horſe, in the order in which we have placed them. Barley was the ancient food for horſes, the diſcovery of oats being comparatively of modern date.

In the north of Holland, they feed their horſes principally on the black ſour bread called bumpernickle, made of buck wheat, and there it is eaten alſo by a large ſhare of the inhabitants; for this purpoſe, they alight from their vehicles, and, without taking the horſes out of their hempen traces, cut it in ſlices, and give them to eat. We obſerved that they appeared relaxed by it, but apparently without much debilitating them, as they ſeemed to do their work very well.

In the "Muſeum Ruſticum" is a propoſition founded apparently on actual experiment of feeding horſes on carrots, vol. i. p. 333. The following remarks we think worth recording from that communication: "I have a couple of hunters which I value as being very good horſes, and theſe I feed in the ſeaſon with very little elſe beſides carrots well cleaned from the dirt, and loaves made of the meal of barley and oats, mixed ſometimes with a ſmall admixture of coarſe but good wheat meal; and if they require to be looſened in their bodies, I now and then give them ſome bran. As to hay, they eat at this ſeaſon but little of it, of oats none at all, yet they go through their work to admiration."

Furze or whinns has been found uſeful food in ſuſtaining horſes, after it has been bruiſed, and the ſpines or prickles cruſhed; this ſome horſes will naturally do with their feet. Dr. Darwin relates, that on one particular common, all the horſes do it; and that freſh comers ſtarve, till by imitation they learn this practice, as the common, in other reſpects, is very barren. In Wales, mills, we underſtand, have been uſed for cruſhing the furze for cattle.

Saintfoin is a food that horſes are very fond of; but as they eat it very greedily, too much ſhould not be allowed at once for fear of indigeſtion, and it ſerves better for horſes of ſlow draught, being a coarſe heavy food.

Salt is imagined an uſeful addition to the food of horſes, Salt marſhes have often a preference given them over other ground for horſes and cattle; whether it is the ſalt that in itſelf operates beneficially, or whether the herbage itſelf is altered by it, and is rendered more ſalutary to the cattle, is not known. The ſame correſpondent, in the Muſeum Ruſticum, ſays that ſalt in ſubſtance is abundantly diſtributed in the mountains by the Swiſs, for the uſe of their cattle and horſes, who become exceſſively fond of it, and more healthy in conſequence; it is conceived to be an antidote to worms and other formations in the body, and the long continued uſe of it to cure them when formed, vol. i. p. 99. Horſes, he obſerves, are fond of it with their oats.

Horſes when at liberty are almoſt ever feeding, therefore long faſting muſt be injurious to the ſtomach, and ſhould be as much as poſſible avoided; they would alſo naturally, there is reaſon to believe, feed principally during the night, and ſleep during the day; their ſleep, however, is hardly ever, in health, profound and faſt, but is a ſtate of watchful dozing.

Horſes are naturally gregarious, and though they will do very well alone, company, where there is an opportunity for it, is preferable for their health. The ſtable ſhould be lofty, ſo as not to confine an atmoſphere about them, loaded with exhalations from their own bodies and their dung: the loftineſs alone of the ſtable is their beſt airing; all partial draughts from doors, windows, or holes into the loft, as far as they affect them, are injurious; for we have often remarked, that though they bear the coldeſt weather of our ſeaſons when turned out, yet they eaſily take cold from partial drafts in ſtables, inſomuch, that perſons not attentive to theſe effects would hardly believe their facility.

In cleaning the ſkin, the curry-comb is conſidered as a neceſſary implement. In warmer climates, where the ſcurf comes away more freely, this inſtrument is not ſo much uſed; and here it is often uſed to horſes whoſe ſkins are particularly thin and ſenſible, yet no difference is made; and though the animal expreſſes, in every way he can, the exceſſive torture it occaſions, yet it is perſiſted in, and violence is often had recourſe to, to enforce it, and horſes are thus rendered vicious and untractable. Where this is found to be the caſe, it would ſave much trouble and inconvenience to uſe a milder kind of comb, or to lay it aſide altogether, and uſe a ſtiff bruſh made for the purpoſe. It is more eaſy by violence and puniſhment to create vice, than to overcome a natural diſlike by it.

Warm clothing, on account of its keeping up a free perſpiration, tends to render the ſkin cleaner, makes the coat lie better, and have a more gloſſy appearance, and ſaves trouble. It is too often, however, carried to an exceſs, and two or three hot rugs keep the horſe in a perpetual fever; and as they are all taken off, when he is moſt expoſed, on going out, the ſudden check given to the perſpiration by the elements without, lays the foundation of diſeaſe, and occaſions inflammations of the lungs, catarrhs, and coughs, that might as well be avoided by more moderate and judicious proceedings, beſides the weakening effects of ſuch violent perſpirations.

There is a principle in feeding them that ought not to be overlooked; which is, that good food may be carried too far, till, inſtead of condition, it produces fever and diſeaſe, and deſtroys the condition it is meant to promote. Green vegetable food fills out the body; and from its weight and watery nature weighs down the abdomen, giving an unſightly appearance. Some horſes, however, can work with this, that more ſtimulating food does not ſuit ſo well. The dry diet braces the ſyſtem, and draws up the abdomen. The food is longer retained in the large inteſtines, which occaſions the flanks to appear full and rounded, and greatly adds to the beauty of the horſe's make in theſe parts.

Some horſes we have noticed have voracious appetites, and devour great abundance of corn, and whatever is ſet before them, yet always look meagre and out of condition. When this has been the caſe, we have been led to believe that by too much food, and of too heating a quality, the ſtomach and inteſtines have been paralyzed, and loſt their powers of forming chyle, or abſorbing it. Turning out to the green paſture will often bring them into condition, and they fall off again in the ſtable. Horſes of ſmall make and fiery temper are, we have thought, more particularly ſubject to this diſeaſe.

Water, like the food, ſhould be given often, and not in too large quantities: ſtinting horſes is a dangerous cuſtom; it induces them, where there is an opportunity to take enough at once, to break their wind, or otherwiſe injure themſelves. See art. *Broken* Wind.

The ſkin, to look well and healthy, ſhould be ſmooth, ſupple, and eaſy upon the muſcles, free from knots, and by no means tight about the ribs. The hair clean, bright, and gloſſy, lying to the ſkin, and not diſtorted, or turning away from it, or twiſted, dry, or thready. The effects of cold air on the ſkin of the horſe, in ſetting up the hair, is well known to the grooms, who cautiouſly avoid it.

Exerciſe to animals by nature born to be fleet, is particularly neceſſary; beſides the good it does in moving and forwarding all the ſecretions and excretions. This ſhould be gentle or vigorous, proportioned to the ſtrength and ſtate of the horſe, without diſtreſſing or too much fatiguing him. A gentle perſpiration looſens the ſcurf, and makes him clean better.

The hide ſoon gets foul, and a groom that has much pride in the appearance of his horſe, is almoſt inceſſantly currying, bruſhing, and hard rubbing the coat.

It is a cuſtomary thing with the dealers in horſes, in forming a judgment of the actual ſtate of the horſe, and whether his condition will admit of farther advancement, to handle the creſt, or upper part of the neck which carries the mane: if this be lax in the hand, and eaſily pliant, it is preſumed the condition may be carried farther; if, on the contrary, this part has a ſtiff tenſe feel, it is conſidered that farther improvement is not to be expected. Among the acknowledged indications alſo of poverty and good condition, is the poor mark in the buttock, that is the channel, or depreſſion running down the buttock, at its poſterior part; being a depreſſion formed between the muſcles. If this channel is very viſible and deep, the horſe is out of condition; if obliterated, ſo as to be hardly viſible, he is conſidered in condition.

Blood horſes are more eaſily cleaned than the common kind of horſes; their coat is not ſo thick, it does not retain the perſpiration ſo much, and the hair takes a better poliſh; which makes an experienced groom always prefer them

Too great excitement from the food, and undue fever, may be known by the heat of the mouth, the fulneſs of the veſſels of the eyes, the ſtrength of the pulſe, and diminiſhed appetite; the ſkin alſo, and extremities, are found too hot or too cold, languor and weakneſs follow: the remedies are before ſtated.

CONDITIONAL, ſomething not abſolute, but ſubject to limitation.

Conditional legacies are not due till the conditions are accompliſhed.

The Arminian divines maintain, that all the decrees of God, relating to the ſalvation and damnation of man, are truly conditional; and the Calviniſts, that they are all abſolute. See Arminian, &c.

Conditional *conjunctions*, in *Grammar*, are thoſe which ſerve to make propoſitions conditional. As, *if*, *unleſs*, *provided that*, *in caſe of*, &c.

Mr. Horne Tooke, in his "ΕΠΕΑ ΠΤΕΡΟΕΝΤΑ, or Diverſions of Purley," &c. has given us a new ſyſtem, with regard to theſe conditionals, as well as other conjunctions. Our conjunction *if*, he ſays, is merely a verb; being the imperative of the Gothic and Anglo-Saxon verb ᏀIꝻĀN, Ᵹiꝼan. And in thoſe languages, as well as in the Engliſh formerly, this ſuppoſed conjunction was pronounced and written as the common imperative, purely ᏀIꝻ, Ᵹiꝼ, *gif*. In proof of the truth of this etymology of the word *if*, the author obſerves, that whenever the datum upon which any concluſion depends, is a ſentence, the article *that*, if not expreſſed, is always underſtood, and may be inſerted after *if*. But the article *that* is not underſtood, and cannot be inſerted after *if*, where the datum is not a ſentence, but ſome noun governed by the verb *if* or *give*. This, he ſays, will hold univerſally, not only with *if*; but with many other ſuppoſed conjunctions, ſuch as, *but that*, *unleſs that*, *though that*, *leſt that*, &c. which are really verbs, put in this manner before the article *that*. *An*, now indeed obſolete, but formerly often uſed to ſupply the place of *if*, is alſo a verb; being nothing elſe but the imperative of the Anglo-Saxon verb Ānan, which likewiſe means to *give* or *grant*. If recourſe ſhould be had for confuting the author's opinion to the conditionals of the Greek and Latin, and Iriſh, the French, Italian, Spaniſh, Portugueſe, and many other languages, he obviates the objection by alleging, that thoſe words which are called conditional conjunctions, are to be accounted for in all languages in the ſame manner as he has accounted for *if* and *an*. Not that they muſt all mean preciſely as theſe two do—*give* and *grant*; but ſome word equivalent: ſuch as, *be it*, *ſuppoſe*, *allow*, *permit*, *put*, *ſuffer*, &c.; which meaning is to be ſought for from the particular etymology of each reſpective language. "To put this matter of doubt," he ſays, "I mean to diſcard all ſuppoſed myſtery, not only about theſe *conditionals*, but about all thoſe words alſo which Mr. Harris and others diſtinguiſh from prepoſitions, and call *conjunctions* of ſentences. I deny them to be a ſeparate ſort of words or part of ſpeech by themſelves. For they have not a ſeparate *manner* of *ſignification*; although they are not devoid of ſignification. And the particular ſignification of each muſt be ſought for amongſt the other parts of ſpeech, by the help of the particular etymology of each reſpective language. By ſuch means alone can we clear away the obſcurity and errors in which grammaiaurs and philoſophers have been involved by the corruption of ſome common words, and the uſeful abbreviations of conſtruction." See Conjunction.

Conditional *propoſitions*, in *Logic*, are ſuch as conſiſt of two parts, connected together by a conditional particle. Of theſe, the firſt, wherein the condition lies, is called the *antecedent*, and the other the *conſequent*.

Thus, "if the ſoul be ſpiritual, it is immortal;" is a conditional propoſition, wherein, "if the ſoul, &c." is the antecedent, and "is immortal" the conſequent.

The truth of theſe propoſitions depends on the truth of the connection of them, and they may be properly denied or contradicted when the negation affects their conjunctive particles. See PROPOSITION.

CONDITIONAL *ſyllogiſm*, is that whoſe major or minor, or both, are conditional propoſitions: *e. gr.* "If there be a God, the world is governed by Providence; but there is a God, therefore the world is governed by Providence." See SYLLOGISM.

CONDITIONAL *eſtate*, *fees*, *pardons*, and *reſignations*. See the ſubſtantives.

CONDITIONALS, *ſcience of*, i. e. of *conditional truths*, imports that knowledge which God has of things, conſidered, not according to their eſſence, their nature, or their real exiſtence; but under a certain ſuppoſition, which imports a condition never to be accompliſhed.

Some of the ſchoolmen deny, that God has the knowledge of conditionals: the Thomiſts maintain, that God's knowlege of conditionals depends on a predetermining decree; others deny it.

F. Daniel obſerves, that the truths which compoſe the knowledge of conditionals, being very different from thoſe which compoſe the knowledge of intuition, and that of underſtanding; a third claſs muſt be added, and the knowledge of God be divided into *intuitive*, *intellective*, and *conditional*. See KNOWLEDGE.

CONDIVI, ASCANIO, in *Biography*, an artiſt whoſe works of painting and ſculpture are now unknown. He is indeed ſaid to have poſſeſſed but an humble ſhare of talent, inſomuch that although he had the good fortune to be the inmate and diſciple of the great Michelangelo Buonaroti for many years, he never attained eminence.

The world however has obligations to Condivi for the life which he wrote of his maſter, in ſomewhat the form of a journal, and which he publiſhed in 1553, ten years prior to the death of Michelangelo. Mr. Mariette, the celebrated connoiſſeur, was decidedly of opinion that the greater part of this narrative was written abſolutely under the immediate inſtigation and guidance of Michelangelo himſelf, and of courſe conſidered it as infinitely more authentic than the florid, but haſty, compoſition of Vaſari. Vaſari had publiſhed a life of the great Florentine artiſt in his firſt edition of 1550. Condivi points out and corrects many of his errors. This Vaſari indignantly reſents in his ſecond edition of 1568; but as Michelangelo was then no longer alive to decide their reſpective claims, the veracity of Condivi ſhould ſuffer no imputation. Vaſari however relates many things which the other omits, dwells more largely upon others, and in his ſecond edition gives us the ſequel of Michelangelo's life, with a long deſcription of his magnificent funeral, &c. it was therefore deſirable to unite theſe and other ſcattered materials into one work: this has lately been done by Mr. Duppa in a handſome quarto volume.

The firſt edition of Condivi is in quarto and become rare. Another edition, with copious notes by Antonfranceſco Gori and Mariette, together with extracts from Vaſari, was publiſhed in Florence, 1746, in folio.

CONDIVICNUM, in *Ancient Geography*, *Nantes*, a town of Gallia Lyonnenſis, according to Ptolemy, and capital of the Namneti, from whom it took its name.

CONDOCHATES, a river of India, on the other ſide of the Ganges, according to Pliny and Arrian, which diſcharged itſelf into the Ganges, about the 26th degree of latitude.

CONDOLENCE, in *Ethics*. See COMMISERATION.

CONDOM, in *Geography*, a town of France, in the department of the Gers, and chief place of a diſtrict, ſituated in a beautiful valley on the river Baiſe, 27 miles N.W. from Auch, and 60 S.E. from Bourdeaux. It has a ſub-prefect and a court of juſtice. The place contains 6917, and the canton 13,232 inhabitants. The territory of the canton includes 247½ kiliometres and 16 communes. The whole diſtrict counts 128 communes and 67,103 inhabitants, upon a territorial extent of 1662½ kiliometres. Its ſoil is in general fertile, except in the ſouthern part, which is an extenſive barren heath; but as there are many marl pits, the waſte land is improved with marl, which renders it tolerably fertile for a term of 20 years, at the end of which the ground is ſuffered to lie waſte again, and another extent of heath is rendered productive upon the ſame plan. Corn, wine, and brandy are the chief articles of trade, moſt of which are ſent to Mont de Marſan and Bourdeaux.

CONDOMOIS, a country of France, before the revolution, of which Condom was the capital.

CONDOMA, in *Zoology*, the name given by Buffon to the ſtriped antelope of Pennant, the antilope ſtrepſiceros of Gmelin's Linnæus, the cervus capenſis, or cape deer, of Collin. Act. Ac. Theod. Palat. 1. 487, the bos ſtrepſiceros of Aldrovand, the ſtrepſiceros of Caius, Geſner, and Jonſton, and the wild goat of Kolben, &c. It has long, compreſſed, wrinkled, tapering, ſharp-pointed ſpiral horns, with a ridge on one ſide which follows the wreaths; the body has a white line along the back, and ſeveral white ſtripes acroſs from that down the ſides towards the belly and thighs. This animal inhabits the country near the Cape of Good Hope. It is near nine feet long from the noſe to the rump, and four feet high at the ſhoulders; the body is long, ſlender, and of a reddiſh-grey colour; the face is brown, having a white line from the corner of each eye, running forwards and uniting above the noſe; the tranſverſe ſtripes above-mentioned are, in general, ſeven in number, four of which point towards the thighs, and three to the belly; it has a ſhort mane on the neck, and long hairs hanging down from the throat to the breaſt; the breaſt and belly are grey; the tail, two feet in length, is brown above, white on the under ſide, and black at the end; the horns are of a duſky colour, and naturally wrinkled, though ſuch as are brought to Europe are highly poliſhed; they are near four feet long, cloſe at the baſes, above two feet and a half diſtant at the points, and have two ſpiral ſcrew-like turns. The female has no horns. It is ſaid to leap with ſurpriſing activity to a great height.

CONDORCET, JEAN ANTOINE, NICHOLAS CARITAT, *Marquis of*, in *Biography*, celebrated as a writer and political character, was deſcended from an ancient family in Picardy in France. He was born in 1743, and was educated at the college of Navarre, where he exhibited an ardent thirſt for phyſical and mathematical purſuits, and acquired the reputation of a hard ſtudent. Condorcet firſt attracted public notice as a mathematician, by his treatiſe "On Integral Calculations," which he wrote when he was only twenty-two years of age, and in which he propoſed to exhibit a general method of determining the finite integral of a given, differential equation, either for differences infinitely ſmall, or finite differences. D'Alembert and Bezout, the commiſſioners of the academy, employed to examine the merits of this performance, declared that the greater part of the methods were of the author's own invention, that the production itſelf indicated a degree of knowledge very ſeldom to be met with at ſo early an age, and that it afforded a preſage of talents worthy of being excited by the approbation of the academy. This was followed by his "Eſſay on Analyſis," and other works, which ſhewed his ſkill in analytical reſearches. In the year 1769, he was admitted member of the Academy of Sciences, the memoirs of which were enriched by various diſquiſitions preſented by him on the moſt abſtruſe ſubjects. During the adminiſtration of Turgot, celebrated no leſs for his integrity, than for his high talents, Condorcet was applied to for aſſiſtance in arranging plans for economical reforms in the ſtate. In 1773 he was appointed ſecretary to the Academy of Sciences, when he compoſed eulogies upon ſeveral deceaſed members who had been neglected by Fontenelle. At this period he was the friend and intimate aſſociate of Voltaire, D'Alembert, and other diſtinguiſhed characters. Like D'Alembert he united in himſelf the reputation of an elegant writer, and of profound ſcience; and in 1782 he was received into the French Academy, on which occaſion he delivered a diſcourſe concerning the influence of philoſophy. In the following year he ſucceeded D'Alembert as ſecretary to that academy, and pronounced an able eulogy to the memory of his deceaſed friend, whoſe literary and ſcientific merits are ſet forth with great ability. The death of Euler afforded Condorcet another opportunity of diſplaying his own talents by appreciating thoſe of the departed mathematician. In his diſcourſe on this occaſion, he exhibited a clear and ſcientific ſtatement of the improvements and inventions introduced into one department of knowledge by the exertions of an individual. The lives of Turgot and Voltaire, and the eulogy pronounced upon the death of the celebrated Franklin, were decided teſtimonies to the abilities of Condorcet as a biographical writer. Turgot had occupied much of his time and attention with moral and political ſciences, and was particularly anxious, for the good of his fellow creatures, that the certainty of which different ſpecies of knowledge are ſuſceptible, might be demonſtrated by the aſſiſtance of calculation, hoping that the human ſpecies would neceſſarily make a progreſs towards happineſs and perfection, in the ſame manner as it had done towards the attainment of truth. To ſecond theſe views of Turgot, Condorcet undertook a work replete with geometrical knowledge. He examined the probability of an aſſembly's rendering a true deciſion, and he explained the limits to which our knowledge of future events, regulated by the laws of nature, conſidered as the moſt certain and uniform, might extend. If we do not poſſeſs a *real*, yet he thought, we have at leaſt a *mean* probability, that the law indicated by events, is the ſame conſtant law, and that it will be perpetually obſerved. He conſidered a forty-five thouſandth part as the value of the riſk, in the caſe when the conſideration of a new law comes in queſtion; and it appears, from his calculation, which we cannot go into, that an aſſembly conſiſting of 61 votes, in which it is required that there ſhould be a plurality of nine, will fulfil this condition, provided there is a probability of each vote being equal to four-fifths, that is, that each member voting ſhall be deceived only once in five times. He applied theſe calculations to the creation of tribunals, to the forms of elections, and to the deciſions of numerous aſſemblies; inconveniences attendant on which were exhibited by him This work furniſhed a grand, and at the ſame time, an agreeable proof of the utility of analyſis in important matters to which it had never before been applied.

Condorcet at this time ſtarted the idea of a dictionary, in which objects are to be diſcovered by their properties, inſtead of being ſearched for by their reſpective names; he alſo intimated a ſcheme for conſtructing tables, by which ten milliards of objects might be claſſed together by means of only ten different modifications. The talents of Condorcet were very various, and he diſtinguiſhed himſelf by many philoſophical and economical diſcuſſions, which it is ſuppoſed, with great juſtice, had a great ſhare in producing the ſubſequent important revolution in France. Without pretending to decide upon the motives of thoſe who were active in achieving the downfal of the French monarchy, we ſhall bring before the reader a brief account of the part which Condorcet took in this buſineſs. Almoſt all his writings tended to pave the way for that moſt important change in government which took place in the year 1789. At this period, and in the following two or three years, he engaged in ſeveral periodical publications, with a view, no doubt, of guiding the public mind. He was a member of the popular clubs at Paris, particularly that of the jacobins, celebrated for democratic violence, where he was a frequent but by no means a powerful ſpeaker. He was choſen a repreſentative for the metropolis, when the conſtituent aſſembly was diſſolved, and joined himſelf to the Briſſotine party which, in point of real talents and integrity, were not inferior to any of the contending factions of the day. But they wanted energy to control the people, and finally fell victims to that revolutionary ſpirit which they had excited. Condorcet at this period was the perſon ſelected from the party to draw up a plan for public inſtruction, which he comprehended in two elaborate and very ſtriking memoirs; the principles laid down were, perhaps, too abſtract for general uſe, and too refined for the preſent ſtate of ſociety. He was the author of a manifeſto addreſſed from the French people to the powers of Europe, on the approach of war; and of a letter to Louis XVI., as preſident of the aſſembly, which was dictated in terms deſtitute of that reſpect and conſideration to which the firſt magiſtrate of a great people has, as ſuch, a juſt claim. Condorcet attempted alſo to juſtify the inſults put upon the ſovereign by the loweſt, the moſt illiterate, and moſt brutal part of a delirious populace. On the trial of the king, his conduct was equivocal and unmanly; he had declared that he ought not to be arraigned, yet he had not courage to defend his opinion or juſtify thoſe ſentiments which he had deliberately formed in the cloſet.

After the death of Louis, Condorcet undertook to frame a new conſtitution, which was approved by the convention, but which did not meet the wiſhes and expectations of the nation. A new party, calling themſelves the MOUNTAIN, were now gaining an aſcendancy in the convention over Briſſot and his friends. At firſt the conteſt was ſevere; the debates, if tumult and diſcord may be ſo denominated, ran high, and the utmoſt acrimony was exerciſed on all ſides. Condorcet always timid, always anxious to avoid danger, retired as much as poſſible from the ſcene. By this act of prudence he at firſt eſcaped the deſtruction which overwhelmed the party; but having written againſt the bloody acts of the mountain, and of the monſter Robeſpierre, a decree was readily obtained againſt him. He was arreſted in July 1793, but contrived to eſcape from the vigilance of the officers under whoſe care he was placed. For nine months he lay concealed in Paris, when dreading the conſequences of a domiciliary viſit, he fled to the houſe of a friend on the plain of Mont-Rouge, who was at the time in Paris. Condorcet was obliged to paſs eight-and-forty hours in the fields, expoſed to all the wretchedneſs of cold, hunger, and the dread of his enemies. On the third day he obtained an interview with his friend; he, however, was too much alive to the ſenſe of danger to admit Condorcet into his habitation, who was again obliged to ſeek the ſafety which unfrequented fields and pathleſs woods could afford. Wearied at length with fatigue, and want of neceſſary ſuſtenance, he went to a public-houſe, and aſked for an omelette, which he devoured with ſo much greedineſs as to induce the ſuſpicion of a municipal officer who was preſent. At this period, ſuſpicion and guilt were divided by very narrow boundaries; the unfortunate man was ſeized and thrown into a dungeon, in order that he might, on the following day, be conducted to the bloody tribunal at Paris. The precaution was, however, unneceſſary. Condorcet was found dead in the morning; and as it was generally underſtood that he was never without a concealed doſe of the moſt active poiſon, to this cauſe his melancholy end was generally aſcribed. Such was the concluding ſcene of the career of a man who had ſuſtained a brilliant part on the ſtage of life. He died March 28, 1794.

His character has been variouſly eſtimated. His manners were mild, and his talents were unqueſtionably of the firſt order. He is ſaid to have been deſtitute of thoſe fine feelings which diſtinguiſh great and generous minds; and it is allowed on all hands that he was a prey to timidity; a paſſion which at length induced him to commit the act of ſuicide. By Madame Rolande, his contemporary and intimate, he was, in his life-time, thus deſcribed: "The genius of Condorcet is equal to the comprehenſion of the greateſt truths; but he has no other characteriſtic beſides fear. It may be ſaid of his underſtanding, combined with his perſon, that it is a fine eſſence abſorbed in cotton. The timidity which forms the baſis of his character, and which he diſplays even in company, on his countenance and in his attitudes, does not reſult from his frame alone, but ſeems to be inherent in his ſoul, and his talents furniſh him with no means of ſubduing it. Thus, after having deduced a principle, or demonſtrated a fact in the aſſembly, he would give a vote decidedly oppoſite, overawed by the thunder of the tribunes, armed with inſults, and laviſh of menaces. The propereſt place for him was the ſecretaryſhip of the academy. Such men ſhould be employed to write, but never permitted to act." Condorcet was married, and lived on the moſt affectionate terms with his wife. He left one daughter, who has, during the preſent ſummer (1807), been married to Arthur O'Connor.

Condorcet was the correſpondent of the great Frederic, and of Catherine, the empreſs of Ruſſia. "Letters to the King of Pruſſia," he publiſhed during his life; and he left behind him, which appeared as a poſthumous work, "A Sketch of a Hiſtorical Draught of the Human Mind." In this work, he conſiders man as he has been, as he is, and as he may be; and he inculcates, with great energy, his favourite idea of the perfectibility of the human ſpecies, and of its advance to actual perfection. He left behind him alſo "A Treatiſe on Calculation," and "An Elementary Treatiſe on Arithmetic." His work on the human mind was written during the months that he ſecreted himſelf from the ſavages who were ſeeking for his blood, with more than inhuman fury; and it is remarkable, and to the credit of the writer, that under ſuch circumſtances, dreading death at every inſtant, he could compoſe ſo able a treatiſe, and feel the conviction of the progreſs of his fellow creatures towards moral improvement. Memoirs of the French Revolution. Rolande's Memoirs.

CONDORE, or Pulo Condore, in *Geography*, an iſland of the Eaſt Indian ocean, about 20 leagues from the coaſt of Cochin-china, taking its name from two Malay words, *Pulo* ſignifying an iſland, and *Condore* a calabaſh, of which it produces great quantities. This iſland is high and mountainous, and ſurrounded by ſeveral ſmaller iſlands, ſome of which are leſs than one, and others two miles diſtant. It is of the form of a creſcent, extending, ſays Capt. King, near 8 miles from the ſouthernmoſt point, in a N.E. direction, and its breadth no where exceeds 2 miles. Sir Geo. Staunton ſays, it is 11 or 12 miles in length, and about 3 in breadth, conſiſting of a ridge of peaked hills. From the weſternmoſt extremity, the land trends to the S.E. for about 4 miles, and oppoſite to this part of the coaſt there is an iſland, called by Monſ. D'Aprés "Little Condore," which runs two miles in the ſame direction. This poſition of the two iſlands forms a ſafe and commodious harbour, the entrance into which is from the north-weſt. The diſtance between the two oppoſite coaſts is ¾ of a mile, excluſive of a border of coral rock, which runs down along each ſide, extending about 100 yards from the ſhore. The anchorage is very good, from 11 to 5 fathoms water, but the bottom is ſo ſoft and clayey, that great difficulty occurs in weighing the anchors. Toward the bottom of the harbour, there is ſhallow water for about half a mile, beyond which the two iſlands approach ſo near each other, as to leave only a paſſage at high water for boats. The moſt convenient place for watering is at a beach on the eaſtern ſide, where is a ſmall ſtream that furniſhes 14 or 15 tons of water a day. Sir George Staunton ſays, that beyond the beach, which ſtretches acroſs two-thirds of the entrance, at the ſouthern extremity of the ſpacious bay on the eaſtern ſide of the iſland, there is a ſafe paſſage to the inner part of the bay, the north of which is ſheltered by a ſmall iſland lying to the eaſtward. The whole of the bay, he ſays, is formed by four ſmall iſlands, which approach ſo nearly to each other as to appear, from ſeveral points, to join. They all ſeem to be the rude fragments of primitive mountains, ſeparated from the great continent in the lapſe of time. This iſland has convenient anchoring-places in either monſoon; and ſir Geo. Staunton ſtopped there, on the 17th of May, in a ſpacious bay on the eaſtern ſide of the iſland. Capt. Gore, on the 20th of January, ſtood for the harbour on the S.W. end of the iſland, which, having its entrance from the N.W. is the beſt ſheltered during the N.E. monſoon.

This iſland, both with reſpect to animal and vegetable productions, is conſiderably improved, ſince the time when Dampier viſited it. Neither that writer, nor the compiler of the Eaſt Indian Directory, mention any other quadrupeds beſides hogs, which are ſaid to be very ſcarce, lizards, and the guanoes; and the latter, on the authority of Monſ. Dedier, a French engineer, who ſurveyed the iſland about the year 1720, ſays, that none of the fruits and eſculent plants, ſo common in the other parts of India, are to be found here, except water-melons, a few potatoes, ſmall gourds, *chibbols* (a ſmall ſpecies of onion), and little black beans. At preſent, beſides the buffaloes, of which there are large herds, it ſupplies remarkably fine fat hogs, of the Chineſe breed. There are alſo ſome of the wild ſort in the woods, which alſo abound with monkies and ſquirrels. One ſpecies of the ſquirrel is of a beautiful ſhining black colour, and another ſpecies is ſtriped brown and white, which is called the flying ſquirrel, from its being provided with a thin membrane, reſembling the wing of a bat, extending on each ſide of the belly, from the neck to the thighs, which, in ſtretching out the legs, ſpreads, and enables it to fly from tree to tree, to a conſiderable diſtance. Lizards are found in great abundance; but Capt. Gore ſays, that none of his company diſcovered the guano, and another animal deſcribed by Dampier as reſembling the guano, only much larger. Among the vegetable improvements of the iſland are fields of rice and tobacco, and groves of cabbage palm-trees, plantains, various kinds of pompions, cocoa-nuts, oranges, ſhaddocks, and pomegranates. Theſe improvements are aſcribed to the French, for the purpoſe of making it a more convenient refreſhing ſtation for any of their ſhips that may be bound for Cambodia, or Cochin-china; and for this purpoſe it is well ſituated. The woods are well ſtocked with feathered game; and particularly with wild hens and cocks, reſembling thoſe of our own country. The land in the neighbourhood of the harbour is a continued high hill, richly adorned with a variety of fine tall trees, from the ſummit to the water's edge; and among others the tea-tree deſcribed by Dampier.

The town in this iſland is ſituated near the ſea ſide, at the bottom of a retired bay, which affords a ſafe road-ſtead during the prevalence of the S.W. monſoon. It conſiſts of between 20 and 30 houſes, built cloſe together; beſides ſix or ſeven others that are ſcattered about the beach. The roof, the two ends, and the ſide fronting the country are neatly conſtructed of reeds; the oppoſite ſide, facing the ſea, is entirely open; but by means of a fold of bamboo ſcreens, they can exclude or let in as much of the ſun and air as they pleaſe. There are other large ſcreens or partitions, for the purpoſe of dividing, as occaſion requires, the ſingle room, of which the houſe properly ſpeaking, conſiſts, into ſeparate apartments. The largeſt houſe of the town, belonging to the chief or captain, had a room at each end, ſeparated by a partition of reeds from the middle ſpace, which was open on both ſides, and provided with partition-ſcreens like the others. It had, beſides, a pent-houſe, projecting four or five feet beyond the roof, and running the whole length on each ſide. At each end of the middle room were hung ſome Chineſe paintings, repreſenting men and women in ludicrous attitudes. In this apartment Capt Gore's companions were civilly deſired to ſeat themſelves on mats, and they were preſented with betel. In one of the apartments, viſited by ſir George Staunton, was an altar decorated with images; and the partitions were hung with figures of monſtrous deities; but the countenances and deportment of the people exhibited no idea of religious awe, nor was any perſon obſerved in the poſture of prayer or adoration. A few ſpears ſtood againſt the wall with their points downwards, together with ſome match-locks, and a ſwivel-gun.

The inhabitants of this iſland, who are fugitives from Cambodia and Cochin-china, are not numerous. They are of a ſhort ſtature, very ſwarthy, and of a feeble, unhealthy aſpect, but ſeemingly of a gentle diſpoſition. The dreſs of theſe people is compoſed chiefly of blue cotton, worn looſely about them; and their flat faces and little eyes indicate a Chineſe origin or relation. Their colloquial language is altogether different from that which is ſpoken in China, but their written characters are all Chineſe.

The Engliſh ſettled in this iſland in 1702, when the factory of Chuſan, on the coaſt of China, was broken up, and brought with them ſome Macaſſar ſoldiers, who were hired to aſſiſt in building a fort; but the preſident not fulfilling his engagement with them, they watched an opportunity, and in one night murdered all the Engliſh in the fort. Thoſe without the fort, hearing a noiſe, took the alarm, and ran to their boats, very narrowly eſcaping with their lives; but not without much fatigue, hunger, and thirſt, to the Johore dominions, where they were treated with great humanity. Some of them afterward went to form a ſettlement at Banjer-Maſſin, in the iſland of Borneo. Since this event, no Europeans have ever reſided in this iſland. The latitude of this iſland, calculated from a meridional obſervation, as ſtated by ſir Geo. Staunton, is 8° 40′ N.; and its longitude, according to a good chronometer, 105° 55′ E. The harbour in which Capt. Gore was ſtationed, is in N. lat. 8° 40′. E. long., deduced from a great number of lunar obſervations, 106° 18′ 46″; dip of the N. pole of the magnetic needle, 2° 1′; variation of the compaſs, 0° 14′ W.; high water at the full and change of the moon, 4^h 16′ apparent time. The water roſe and fell 7 feet 4 inches perpendicular. Voyage to the Pacific Ocean, by captains Cook, Clerke, and Gore, vol. iii. p. 450. &c.

Condore, in *Ornithology*, the *Vultur Gryphus* of Latham, (Ind. Orn.) Klein, Briſſon, Borowſk., the cuntur of Laet and Ray, the conder of Frezier, Condamine, Buffon, and Molina, and the condor of Latham (Syn. and Sup.) is a bird of enormous ſize, having a longitudinal warty excreſcence on the crown of the head, and a naked throat. It inhabits South America; and its ſize is ſo enormous that the wings, when extended, meaſure 9, 12, or even 16 feet from top to tip; the largeſt quill-feathers of the wings ſometimes meaſure $2\frac{1}{2}$ feet in length, and the quill-part $1\frac{1}{2}$ inch in circumference. The body is of a black colour, with a white back; the neck is ſurrounded with a collar of longiſh white feathers; the chin is reddiſh; the head is clothed with brown down or wool; the eyes are black, with cheſnut or light reddiſh irides; the bill is black, with a whitiſh point; the legs and feet are black, and the claws are ſtraightiſh; the tail is ſmall. The female is conſiderably larger than the male, which it reſembles, except in having a crown creſt or tuft on the ſcrag, or hinder part of the neck. The condore builds its neſt on the higheſt mountains, under the ſhelter of ſome projecting ſhelf of a rock, in which the female lays two white eggs. It preys on calves, ſheep, goats, and ſuch animals, and when very much preſſed by hunger, it has been known to carry off children of ten years of age; and two of them are ſaid to be able to devour the carcaſe of a cow at one meal. When it alights upon the ground, or riſes from it, the noiſe it makes with its wings is ſuch as to terrify, and almoſt to deafen, any one who happens to be near the place. Don Ulloa informs us, that he actually ſaw one of them riſing with a lamb in its talons. The Indians have various ways of catching them: beſides traps and ſnares laid for them near any carrion, they kill a cow or other animal, and moiſten its fleſh with the juice of ſome ſtrong intoxicating herbs, and then bury the body till it putrefies. In this ſtate they take it up and lay it on the ground; and when the condores come near to devour it, they are intoxicated and rendered motionleſs, when the Indians fall upon and kill them.

CONDORMIENTES, religious ſectaries, whereof there have been two kinds. The firſt aroſe in Germany, in the thirteenth century; their leader was a native of Toledo. They held their meetings near Cologne; where they are ſaid to have worſhipped an image of Lucifer, and to have received anſwers and oracles from him: the legend adds, that an eccleſiaſtic having brought the euchariſt to it, the idol broke into a thouſand pieces; which put an end to the worſhip. They had their name from their *lying all together*, men and women, young and old.

The other ſpecies of Condormientes were a branch of Anabaptiſts in the ſixteenth century; ſo called, becauſe they lay, ſeveral of both ſexes, in the ſame chamber; on pretence of evangelical charity.

CONDOTTIERI, in the Italian *Policy*, denoted leaders of bands, who, in the 15th and 16th centuries, made a trade of war, and raiſed ſoldiers in order to hire them out to different ſtates.

CONDREN, Charles de, in *Biography*, ſuperior general of the fathers of the oratory, was born near Soiſſons in the year 1588. By his father, who was in high eſtimation in the court of Henry IV., he was deſigned either for a poſt about the king, or for the military profeſſion. His own inclinations, however, led him to think of the church, as moſt ſuited to his talents, to which, after ſome heſitation, his father gave an aſſent. He accordingly proſecuted his ſtudies in the college of the Sorbonne at Paris, was ordained prieſt, and admitted a doctor of that ſociety in the year 1614. In the following year he became a member of the congregation of the oratory, and founded ſome houſes belonging to that order. He was not long in obtaining a diſtinguiſhed reputation for integrity and prudence as a man, and for piety and benevolence as a prieſt. On account of theſe traits in his character he was fixed upon as the moſt proper perſon to be confeſſor to the duke of Orleans, only brother to Louis XIII. In this ſituation he was ſucceſsfully employed in confidential buſineſs between the duke and the king, and was the happy means of reſtoring theſe princes to a mutual good underſtanding with one another, after long and violent diſagreements. For theſe ſervices he was offered the archbiſhopric of Lyons, and a cardinal's hat; but he declined accepting offices of honour and emolument for having performed thoſe acts, which, his religion taught him, were binding upon every Chriſtian. He died in the year 1641, leaving behind him many pieces which evidenced ſuperior talents, and a ſincere piety. His principal works are, "Diſcourſes and Letters," 2 vols. 12mo. 1648; and "An Explanation of the Prieſthood of Jeſus Chriſt," publiſhed in 1677. Father Amelotte drew up an account of his life, in which there is a collection of his letters and maxims with an expoſition of his opinions. Nouv. Dict. Hiſt.

CONDRIEUX, in *Geography*, a ſmall town of France, in the department of the Rhône, at the foot of a hill on the river Rhône, 21 miles ſouth from Lyons. This place is celebrated for its excellent ſweet wine.

CONDROS, CONDROTZ, in *Geography*, is a tract of land in the circle of Weſtphalia, ſituated in the biſhopric of Liege, which formed part of the German empire, and is now incorporated with France. Condruſi, in ancient geography, was reckoned part of Belgica. Huy, which was conſidered as the principal town of Condros, is, at preſent, the chief place of the diſtrict of the ſame name in the department de l'Ourthe. See HUY.

CONDUCT, *ſafe*. See SAFE-*conduct*.

CONDUCTOR (from *conduct*, and *to conduct* from the French *conduire*) *prime*, in *Electricity*, is a body of a conducting ſubſtance, (*viz.* ſuch as will tranſmit the electric power or fluid) placed immediately before the glaſs cylinder, or globe, or plate, or other excitable body, of an electrical machine. Its office is to collect the electricity, and to convey it either in the form of ſparks, or ſilently, to other bodies that may be preſented to it in the courſe of experiments. Without this prime conductor no large ſparks could be drawn immediately from the excited electric, becauſe the electric body, being in its nature incapable of conveying the electric fluid through its ſubſtance, diſcharges, on a body which is preſented to it, that quantity of electricity only which is accumulated upon a ſmall part of its ſurface. But when the prime conductor is placed before the excited electric, the former ſucceſſively collects all the electricity from the ſurface of the latter, whilſt revolving; and if a proper body be brought near its ſurface, the electricity which has been accumulated, will ruſh from every part of the ſurface of the prime conductor in a copious ſtream, or in a full ſpark, to that body.

The forms of prime conductors have been continually varied from the very firſt invention of electrical machines, according as new diſcoveries, or the progreſs of experience, have either detected former defects, or ſuggeſted more advantageous forms. A gun-barrel, or a metallic chain, ſupported by ſilk ſtrings, formed the prime conductor of the earlieſt electrical machines, *viz.* ſuch as were uſed towards the beginning of the laſt, or eighteenth century. And in conſequence of this uſage ſome diſtinguiſhed late writers on the continent, have retained the name of *chain* for the prime conductor, long after the ſhape of that inſtrument had undergone a total alteration. See "l'Elettriciſmo artificiale del P' Beccaria."

Though the gun-barrel or the chain would be highly improper for the modern electrical machines, either of them was quite ſufficient for thoſe of the old conſtruction, in which the excitation was very ſlight and difficultly obtained. But when the glaſs globes or cylinders began to be made much larger, when a better method of excitation was diſcovered, and eſpecially when Mr. Canton's amalgam was introduced, to which the great power of the modern electrical machines is principally owing; then the chain or the gun-barrel was found incapable of retaining the electric power, ſo that every narrow edge, or point, or curvature of the ſame, was found to diſſipate the electricity into the ſurrounding air, as could be eaſily perceived in a darkened room. This ſuggeſted the idea of enlarging the ſize, and ſmoothing the irregularities of the prime conductor, in conſequence of which ſome prime conductors were made of braſs, others of tin, or even of gilt paper; and their ſhape became much more regular and compact. A cylinder with ſpherical terminations has been the moſt uſual form of prime conductors. A few were made ſpherical; Dr. Prieſtley uſed one of a pear-like figure, and ſome have alſo been made of other fanciful ſhapes. But amongſt all thoſe forms, that which the practice of the beſt electricians has found to be, upon the whole, the moſt eligible, is the abovementioned one of a cylinder with hemiſpherical terminations. Thoſe terminations, in ſmall prime conductors, ſometimes are made a little larger in diameter than the cylinder; but in the prime conductors of the larger kind, they do not project beyond the ſurface of the cylindrical part. As the conducting nature of their ſubſtance muſt be of the beſt kind, the prime conductors are made of metal, at leaſt on their ſurface. The ſmall ones are made of hollow braſs, or tin plates, or of wood covered with tin-foil. But the large ones are almoſt always made of wood, or paſte-board covered with tin-foil. The prime conductors of tin are frequently covered with a black varniſh, which is preſerved cleaner than the ſurface of the tin, and may perhaps in ſome meaſure prevent the diſſipation of electricity from their ſurface. In any conſtruction, care muſt be had, that the ſurface of the prime conductors be quite free from points, and ſharp edges; and if holes are to be made in them, which indeed are neceſſary for the performance of various experiments; theſe ſhould be well rounded off and their edges burniſhed. The prime conductor is generally ſupported in an horizontal poſition, by one or two glaſs ſticks, which proceed from the bottom board of the electrical machine, or from ſeparate wooden ſtands; the extremities of thoſe glaſs ſticks entering a little way within the ſurface of the conductor. The direction of the prime conductor is moſtly perpendicular to the axis of the glaſs cylinder of the machine; but in ſome electrical machines, the conductor, or two conductors, are ſituated parallel to the abovementioned axis. When two conductors are affixed to the machine, one of them, which collects the electric fluid from the excited glaſs, is called the *poſitive conductor*, and the other, which is connected with the rubber, is called the *negative conductor*. At that extremity of the prime conductor, which ſtands neareſt to the glaſs globe or cylinder, when the former is perpendicular to the axis of the latter, or on the ſide when it ſtands parallel, the collector is affixed. See COLLECTOR.

To the oppoſite extremity of the prime conductor which ſtands fartheſt from the glaſs cylinder or globe, a thick braſs wire, with a pretty large and ſmooth braſs ball, is uſually affixed, and from this ball the longeſt and denſeſt ſpark can be drawn; the greateſt endeavour of the electric fluid to eſcape from the prime conductor being made at that extremity. In plate machines, *viz.* where glaſs plates are uſed inſtead of a globe or cylinder, the extremity of the prime conductor is furniſhed with two ſemicircular projections, which carry the collecting points at their extremities. The ſize of the prime conductor muſt be proportionate to the ſize of the machine; for if the prime conductor be too ſmall, the ſparks that are drawn from it will not be of the largeſt ſize poſſible to be obtained with that machine; and, on the other hand, if the prime conductor be too large, the diſſipation of electricity from its ſurface will be very conſiderable. It is difficult to determine the exact ſize which might be the moſt advantageous for a given machine; for even with cylinders of the ſame ſize, different prime conductors might be uſed, according as the glaſs cylinders are more or leſs capable of a vigorous excitation. With one of the largeſt glaſs cylinders ever made in this country, which meaſured two feet in diameter, a prime conductor of wood covered with tin-foil was uſed, which meaſured ſix feet in length and 18 inches in diameter. With a ſmall machine, the cylinder of which was ſeven inches in diameter, a prime conductor of two feet by three inches and a half was found the moſt advantageous. When the electrical machine is to be uſed only for charging a battery, then it will be better to uſe a very ſmall prime conductor.

The forms of the above-mentioned prime conductors are repreſented in the various plates relating to electricity that are contained in this work.

CONDUCTOR *of Lightning.* See CONDUCTORS.

CONDUCTOR, in *Surgery*, is an inſtrument which ſerves as a guide for a ſcalpel, in ſeveral operations which do not allow the ſurgeon's diſcerning the exact courſe or extent of a wound. For inſtance, in opening a fiſtulous orifice, or dilating the abdominal ring in a ſtrangulated hernia.

Conductors are either made of ſteel or of ſilver; and always have a groove on one ſide, to direct the cutting inſtrument. That which ſurgeons employ in cutting for the ſtone is named a GORGET. This is an inſtrument generally made of ſteel, and introduced, in the operation of Lithotomy, through the artificial orifice, into the bladder, in order to widen the neck of the bladder, and facilitate the introduction of the forceps, with which the ſtone is to be extracted. There are two ſpecies of this inſtrument; the one, which is provided with a knob at the top, is termed the *male* gorget; and the other with an excavation, the *female* gorget. See LITHOTOMY.

There is alſo a machine invented by Mr. Walker, by means of which, a patient labouring under a ſimple or compound fracture of the leg, may be conducted with ſafety and convenience from one place to the other, and the extremities of the bones kept in their proper ſituation during the progreſs of the cure.

To this head belong the conducting apparatus invented for the ſame purpoſe by Mr. Theden of Pruſſia, which are uſed in fractures of the ſuperior and inferior extremities. Machines adapted for fractures of the femur have been deſcribed by Mr. Schmucker, and thoſe for other parts by Mr. Theden himſelf. Mr. Richter conceives that theſe machines may be rendered more ſerviceable, by conſtructing them of tinned iron, inſtead of wallnut-tree wood.

CONDUCTORS. In two important branches of natural philoſophy, a marked diſtinction has been obſerved between the various known bodies of the earth; and upon the peculiar properties of the two different claſſes of bodies, which are diſcriminated from each other by the above-mentioned diſtinction, numerous phenomena, of conſequence to the human ſpecies, are abſolutely depending. The two branches, of natural philoſophy, above alluded to, are the ſcience of electricity and the ſubject of heat. In electricity, if an excited piece of glaſs, or an electrified conductor, be touched with the extremity of a ſtick of ſealing-wax, which a man holds by its other extremity; or if it be touched with the extremity of a ſilk ſtring, the electric power will not be diſſipated; but if the electrified body be touched with the extremity of a rod of iron or braſs, held in a manner ſimilar to the ſtick of ſealing-wax, the electric power will be inſtantly diſſipated; *viz.* it will paſs through the metallic rod, and through the perſon that holds it, &c. Hence it evidently appears, that iron or braſs will permit the tranſition of the electric power through its ſubſtance; whereas ſealing-wax or ſilk will not permit it. Therefore, iron, braſs, and all thoſe ſubſtances through which the electric power can be tranſmitted, are called *conductors of electricity;* and all thoſe ſubſtances, which, like the ſealing-wax or the ſilk, will not permit the paſſage of the electric power, are called *non-conductors of electricity*.

A ſimilar diſtinction has been remarked in the ſubject of heat and cold. Take a ſmall piece of charcoal, make it red hot at one end, and in that ſtate it will be found that a perſon may hold it with his fingers within about a quarter of an inch of the red-hot extremity, without feeling any unpleaſant degree of heat; but if an iron rod as thick as the charcoal be rendered red hot at one end, a perſon will not be able to hold it within leſs than four or five inches, at leaſt, of that end; and ſuch is the caſe with all metallic bodies, as well as with ſome other ſubſtances; which ſhews that heat will paſs through certain bodies much more eaſily than through others. Hence thoſe bodies which, like the iron rod, will eaſily tranſmit the heat through their ſubſtance, are called *conductors of heat;* and thoſe which will convey it with great difficulty, are called *non-conductors of heat.* It muſt be obſerved, however, that though heat will paſs incomparably more eaſily through certain bodies than through others; yet there are no bodies that are known to be either perfect conductors or perfect non-conductors of heat. And indeed, the like obſervation, though in a much more limited manner, may be made with reſpect to the conductors of electricity.

In magnetiſm alſo, the name of *conductor of that power* has been given to a ſingle ſubſtance, namely, to ſoft iron; but the peculiar nature of iron in that reſpect, or rather the paſſage of the magnetic power, will be explained under the article MAGNETISM. We ſhall now in an orderly manner ſtate the various particulars which have been aſcertained with reſpect to the above-mentioned two claſſes of bodies; *viz.* firſt with reſpect to electricity, and then with reſpect to heat.

CONDUCTORS *of Electricity.* In endeavouring to point out the true nature of electrical conductors, it becomes neceſſary to give a liſt likewiſe of the non-conductors of that power, ſince theſe two claſſes of bodies gradually approach each other, in proportion as they are leſs perfect of their kind, as far as certain ſubſtances, which ſeem to ſtand in an intermediate ſtate between conductors and non-conductors, ſo as to participate of both. Glaſs, ſealing-wax, amber, ſilk, and ſeveral other bodies, which, by means of friction with a dry and clean hand, are capable of being excited, ſo as to exhibit electrical phenomena, are called *electrics;* and theſe identical bodies have been found to be non-conductors of electricity; hence *electrics* and *non-conductors* mean the very ſame claſs of bodies. In the ſame manner it has been found, that thoſe bodies, which will eaſily tranſmit the electric fluid through their ſubſtance, cannot be excited in the above-mentioned manner; hence *conductors* and *non-electrics* do alſo denote the ſame bodies.

Strictly ſpeaking, as we have already hinted above, there is no ſubſtance which may be called a perfect conductor or a perfect non-conductor of electricity; the electric power finding ſome reſiſtance in its paſſage through the beſt conductors, and being in ſome degree capable of paſſing through the beſt electrics, at leaſt under certain circumſtances. The following liſts contain the conductors and the electrics, or, which is the ſame thing, the non-electrics and the non-conductors. They are diſpoſed in the order of their perfection; that is, the beſt conductors and the beſt electrics are placed at the heads of their reſpective liſts; and thoſe which participate of both, meaning thoſe which are partly electrics and partly conductors, will be found towards the end of each liſt. In this, however, no great accuracy muſt be expected; firſt, becauſe a very accurate diſcrimination is impracticable when ſubſtances are expreſſed under general denominations; and, ſecondly, becauſe the preciſe degree of conducting or non-conducting power in moſt ſubſtances cannot be determined on account of their fluctuating nature.

Conductors.

Gold.
Silver.
Copper.
Platina.
Braſs.
Iron.
Tin.
Mercury.
Lead.
Semi-metals.
Metallic ores; of which the beſt are thoſe which contain a greater proportion of metallic parts, and neareſt to a reguline ſtate.
Charcoal, either of animal or vegetable ſubſtances. The conducting power of charcoal is very equivocal; for ſome pieces of it will hardly conduct at all, and others will ſuffer the paſſage of the electric fluid over their ſurface only, and not through their ſubſtance. The reaſon of this difference is not quite underſtood; but it ſeems owing to the degree of heat that is applied in the proceſs of making them. See Prieſtley's ſecond volume of Obſervations on different Kinds of Air, ſect. xiv.
Animal fluids.
Acids.
Saline ſubſtances.
Hot water.
Cold water.
Salt water.
All other liquids excepting oils.
Red-hot glaſs.
Melted reſin.
Flame, or the effluvia of flaming bodies.
Ice and ſnow; but not below a certain temperature; for Mr. Achard, at Berlin, in January 1776, obſerved that frozen water, or ice, at the temperature of 28° below 0° of Reaumur's ſcale (equal to —13 of Fahrenheit's) was become an electric. He tried his experiments in the open air, where he found that a rod of ice two feet in length, and two inches thick, was a very imperfect conductor at the temperature of 6° below 0° of Reaumur's thermometer, and that it would not conduct in the leaſt at 20° below 0°. By whirling a ſpheroid of ice in a proper machine, he even electrified the prime conductor, ſo as to attract, repel, give ſparks, &c., like any other electric.
Moſt ſaline ſubſtances, of which the metallic ſalts are the beſt.
Earthy and ſtony ſubſtances, of which the hardeſt are the worſt.
Glaſs filled with boiling water, as mentioned by Kinnerſley.
Smoke.
Vapour or ſteam of boiling water.
All compounds, in which different proportions of the above-mentioned ſubſtances enter, are conductors in different degrees.
An imperfect vacuum, or the abſence of air produced by the action of an air-pump. But a perfect Torricellian vacuum is not a conductor of electricity. Mr. Walſh, aſſiſted by Mr. De Luc, having made a double barometer, in which the mercury had been accurately boiled, ſo as to expel all the air from the tube, found that the vacuum in the arched part of this double barometer was not a conductor of electricity, nor any electric light could be ſeen in it. (Prieſtley's Experiments and Obſervations on Elaſtic Fluids, vol. i.) This remarkable diſcovery was afterwards confirmed by the experiments of Mr. Morgan. (Phil. Tranſ. vol. lxxv.)

Electrics.

Glaſs, and all vitrifications, even thoſe of metals.
All gems, of which the moſt tranſparent are generally the beſt.
All reſins and reſinous compounds.
Amber.
Sulphur.
Baked wood, if not ſuffered to imbibe moiſture.
All bituminous ſubſtances.
Wax.
Silk.
Cotton.
All dry and external animal ſubſtances, as feathers, wool, hair, &c.
Paper.
White ſugar and ſugar-candy.
Air, and other gaſes.
Oils.
Dry and complete metallic oxides.
The aſhes of animal and vegetable ſubſtances.
All dry vegetable ſubſtances.
All hard ſtones, of which the hardeſt are the beſt.
Soft ſtones when heated, according to Delaval.
Powders not metallic, according to Delaval.
Ice, at the temperature of —13° of Fahrenheit's thermometer, according to Achard.

According to Mr. Walſh's, and Mr. Morgan's experiments, the Torricellian vacuum ought to be placed at the head of the liſt; but the ſingular nature of a vacuum, though a non-conductor, will hardly entitle it to the name of an electric. We muſt, however, refer all farther obſervations, reſpecting *electrics,* to the article of that denomination;
the

the above liſt having been inſerted in this place merely to elucidate the nature of conductors.

Thus far we have ſtated the number of conductors, and their gradation, with reſpect to common electricity; but that lately diſcovered branch of this ſcience, which is at preſent aſſiduouſly cultivated under the title of Galvaniſm, has pointed out a peculiar arrangement of conductors with reſpect to the order of their capability of conducting that power which affect the limbs of a prepared animal, and of conveying the power of a galvanic, or rather a Voltaic, battery. See the article GALVANISM. Concerning the former of theſe powers, we tranſcribe a liſt, followed by a few remarks, from Cavallo's Treatiſe on Electricity, 4th ed. vol. iii. p. 20; and with reſpect to the latter, we ſubjoin an abridged extract from a paper of Erman, in the Annales de Chimié, Feb. 1807.

Conductors of Animal Electricity, according to Dr. Lind's and Mr. Cavallo's experiments, which however are arranged with diffidence by the latter, conſidering the difficulty of making the arrangement, and that, in this branch of electricity, the metals do not ſeem to act merely as conductors—The liſt begins with the beſt.

" Malleable platina.
Silver.
Gold.
Quickſilver.
Copper.
Braſs.
Tin.
Lead.
Iron.
The human body.
Salt water.
Freſh water."

" The metallic ores are not ſo good conductors as the purified metals themſelves, and their conducting power is various according to the nature of the ores, but even the metallic ſalts are tolerably good conductors.

" It is very remarkable, that the flame of tallow candle, which is a good conductor of common electricity, will not conduct the animal electricity, when placed in a ſhort interruption made in the circuit of communication. Charcoal, placed in the ſame ſituation as the flame of the candle, was alſo found to be a non-conductor, except when it was actually burning, in which ſtate it conducted tolerably well; but Mr. Volta ſays that he has found ſome pieces of charcoal that acted as well as the metals. Dr. Valli obſerved, that human bodies are not all equally good conductors. Out of four perſons in a company, he found that when two of them formed the circuit of communication between the nerve and the muſcles of a frog, the motions took place very readily. When a third perſon formed the circuit, the motions were very weak; but that when the fourth perſon formed the communication no motion took place. This experiment, he adds, was often repeated with the ſame ſucceſs. The effect, however, may be owing to the different dryneſs of the ſkin. Vitriolic acid, and what is very remarkable, alcohol, appear to conduct this property rather better than water.

" The arteries and the veins are not ſo good conductors as the nerves; for when a blood-veſſel forms part of the circuit of communication, the contractions will take place only when nervous ramifications are adhering to it, and if theſe be carefully ſeparated, the motion will not take place. The ſame thing may be ſaid of the tendons, the bones, and the membranes; for when either of thoſe parts is ſeparated from the body, and is introduced in the circle of communication between the muſcles and nerves of a prepared frog, no motion will enſue, excepting, indeed, when thoſe parts are full of moiſture, and are in immediate contact with the nerve of a prepared frog. Dry nerves are not conductors of animal electricity. Dr. Valli found that the internal ſubſtance of a nerve conducts much better than its external, or coat."

Silver and zinc, profeſſor Aldini ſays, will produce contractions in the muſcles of a frog, many hours after it has become inſenſible to the action of either of them, ſeparately uſed.

Mr. Erman, in his paper on two new claſſes of galvanic conductors, ſays that the bodies which may be applied to the poles of a galvanic pile are, I. *Non-conductors.* II. *Conductors.* The conductors are either *perfect* or *imperfect*; and the imperfect conductors are ſo, either with reſpect to *both poles*, or with reſpect to *one of the poles* of a galvanic battery.

I. The *perfect non-conductors* prevent the communication of the power of both poles effectually; and ſuch are glaſs, reſins, ice, and the vapour of water, ſulphur and its flame, amber, but not its flame.

II. The *perfect conductors*, which diſcharge both poles completely, are the metals, and all in the ſame degree.

The *imperfect conductors of both poles.* Theſe, though capable of forming the galvanic circuit, exhibit in their extent effects of two different kinds. Fluid water and bodies impregnated with water are of this nature.

The *imperfect conductors of the poſitive pole only.* Theſe are incapable of forming the galvanic circuit; for when interpoſed between the two poles of the pile, they inſulate the negative power and conduct the poſitive; whence it follows, that the negative becomes charged, whereas the poſitive is conducted. The flame of hydrogen gas, and the flame of the hydrocarbonated bodies, have this property.

Laſtly, *the imperfect conductors of the negative pole only* inſulate the power of the poſitive, and conduct the power of the negative pole. Of this ſort are the flame of phoſphorus and of alkaline ſoaps.

There now remain two other particulars, which demand our examination with reſpect to the conductors of electricity. Theſe are the method of aſcertaining their peculiar degrees of conducting power, and their uſes. The ſimpleſt method of determining whether any given body be a conductor or not, is to affix an electrometer to the prime conductor of an electrical machine, and when the machine is in action, and of courſe the electrometer is diverging, to touch the prime conductor with one extremity of the given body, which the operator holds in his hand by the other extremity; for if, in ſo doing, the electrometer collapſes, the body in queſtion is a conductor; but if the electrometer continues to diverge, that body is a non-conductor. Its degree of conducting power may alſo be, in great meaſure, eſtimated from the quickneſs with which the electrometer loſes its divergency. In the performance of this experiment, the operator ſhould take care that the electric fluid does not run over the ſurface of the body under trial to the hand that holds it, which generally takes place when the machine acts powerfully, and the body in queſtion is not much extended. In this caſe, it becomes proper to ſtop the revolution of the glaſs globe or cylinder, when the body is to be put in contact with the prime conductor. But if the body be very ſmall, it will be ſufficient to uſe a ſimple electrometer only, which may be eaſily cauſed to diverge by means of an excited ſtick of ſealing-wax, and may then be touched with the body in queſtion. Yet all this is not ſufficient to diſcriminate the peculiar powers of ſubſtances that are of the ſame claſs, ſuch as the various metallic ſubſtances, the different ſtones, &c. And for this purpoſe various other means may be adopted, according to the nature of the bodies under examination. The beſt way of determining the peculiar conducting powers of metallic ſubſtances, is to have wires of the different metals drawn through the ſame hole, ſo as to be preciſely of the ſame diameter, and then melt them by the diſcharge of a battery; *viz.* take a wire, of about one-fiftieth of an inch in diameter, and connect it with the outſide of a battery, containing at leaſt thirty ſquare feet of coated ſurface, and connect the other extremity of the wire with one branch of the diſcharging rod. Then, when the battery is charged, touch the wires which proceed from the inſide of it with the other branch of the diſcharging rod, which will force the exploſion to paſs through the wire that has been interpoſed between the battery and the diſcharging rod, generally melting a greater or a ſmaller part of it, according to the nature of the metal. Thus by repeating the experiment ſucceſſively with wires of the ſame length and diameter, but of different metallic ſubſtances; charging the battery conſtantly to the ſame height, which may be eaſily accompliſhed by means of a quadrant electrometer; and meaſuring the length of each wire that has been melted by the exploſion; their various conducting powers may be aſcertained; obſerving that the worſt conductors are more eaſily melted, and *vice verſâ.* Mr. Henley found that the ſame charge melted 4 inches of gold wire, 6 of braſs, 8 of ſilvered copper, 10 of ſilver, and rather more than 10 of iron. In melting wires of a conſiderable length, as for inſtance two or three feet, it often happens that the force of the exploſion barely renders it red hot, without actually melting it. In this caſe, it is curious to obſerve that the redneſs appears firſt on that extremity of the wire which communicates with the poſitive ſide of the battery, and thence proceeds towards the other end of the wire, which ſhews an ocular proof of the theory of a ſingle electric fluid; the wire, however, is not rendered red hot at one extremity before the other, in conſequence of the progreſſive motion of the electric fluid through it, but becauſe that fluid loſes ſome of its impetus in going through the wire, ſo that the wire ſuffers the greateſt effect of the ſhock on that end which the electric fluid enters; in conſequence of which, that ſame end will be rendered red hot much ſooner, and in a greater degree, than thoſe parts which are more remote from it.

When the conducting powers of different fluids are to be aſcertained, the beſt method of performing the experiment is to fill very narrow glaſs tubes, ſuch as are uſed for ſpirit thermometers, with the fluids in queſtion, introducing a pin at each end of the tubes; and to preſent them ſucceſſively to the prime conductor, after the manner already deſcribed. For other kinds of bodies other methods may be adopted for aſcertaining their conducting powers. Theſe, however, need not be particularly deſcribed; firſt, becauſe they may be eaſily derived from thoſe that have been deſcribed above; and, ſecondly, becauſe they muſt be varied according to the nature of the bodies in queſtion. After all, it muſt be acknowledged, that the metals excepted, no very great degree of accuracy can be expected with other ſubſtances; ſince the fluctuation of their conducting powers ariſes from a variety of ſlight, and almoſt imperceptible differences, ſuch as the difference of temperature, of moiſture, of admixture with other ſubſtances, &c. Thus, glaſs itſelf becomes a conductor, when heated to a certain degree; and the very ſame body will conduct more or leſs readily, even by being placed nearer to or farther from certain other bodies.

In conſidering the conducting power of natural bodies, one may naturally aſk, whence does that property ariſe; or how is it, that certain bodies will, whilſt others will not, conduct the electric power? The preſent ſtate of knowledge, however, does not afford a ſatisfactory anſwer to this queſtion. Various ſuppoſitions have been offered by the late Dr. Prieſtley and others; but as they are inſufficient for the explanation of the phenomena, we ſhall not attempt to ſtate them in this place.

The uſes of conductors are remarkable and extenſive, though they are not yet fully aſcertained to the entire ſatisfaction of the ſpeculative philoſopher. In the firſt place, the ſcience of electricity, or the exiſtence of the electric power, would be abſolutely unknown, were it not for the difference of conducting and non-conducting bodies; for otherwiſe the electric fluid which is manifeſted to us, and operates merely by its paſſage from one body to another, could neither be confined nor accumulated in any place; in conſequence of which, its uniform diſperſion throughout the univerſe would remain inactive and unperceived. But the movements of conducting and non-conducting bodies in the world, their contact, or even their approach without any actual contact, condenſes the electric fluid in one place, and rarefies it in another; and this takes place between the clouds and the earth, &c. By the change of their ſtates of exiſtence, ſome bodies abſorb from other bodies; and others depoſit upon other bodies conſiderable quantities of electric fluid. Thus, a perpetual and ample circulation of that fluid is continually kept up amongſt all the ſubſtances of the terraqueous globe, whence thunder and lightning, vaporization, and probably ſeveral other important operations of nature, are derived. In order to underſtand the action of conductors when oppoſed to each other, ſee the nature of electric atmoſpheres under the article ELECTRICITY.

The greateſt advantage which mankind have derived from the knowledge of the preſent ſubject, is the adoption of a conductor for the preſervation of buildings and veſſels againſt the dire effects of lightning. The identity of electricity and lightning proved by Dr. Franklin, and his ſubſequent introduction of conductors for preſerving buildings, form two of the grandeſt diſcoveries of the laſt century. It was propoſed by the above-mentioned philoſopher to raiſe a metallic conductor ſome feet above the higheſt part of the building, to continue the ſame down along the outſide of the wall, and below it, deep into the earth, or, which is preferable, to connect it with ſome well or drain. By theſe means the houſe would have little to apprehend from a ſtroke of lightning; for, ſince an electrified body is well known to ſtrike the neareſt and beſt conductors that may happen to be in its way, it is evident that the conductor ſituated in the abovementioned manner, being of metal, and higher than any part of the building, would naturally be ſtruck by the lightning in preference to any other part, and would conduct it to the ground, without any damage to the building.

This reaſonable propoſal was no ſooner offered by the ſagacious Franklin, than it was adopted in America, in Europe, and elſewhere. Numerous facts ſoon proved the uſefulneſs of ſuch conductors, and extended its adoption; by ſhewing that ſeveral houſes, which before had been repeatedly ſtruck by the lightning, eſcaped unhurt after the application of the conductor; that, in many places, the conductors of houſes were actually ſtruck by the lightning, which melted them about their extremities, yet the houſes themſelves received no injury; and ſo forth.

Though the conductors were inſtantly adopted, yet their moſt uſeful form, eſpecially with reſpect to their upper termination, has been much controverted; and it is but lately that the true ſtate of the queſtion has been elucidated. The queſtion was, whether the conductors ſhould terminate in a point, according to Dr. Franklin's original propoſal, or in a ball. Mr. B. Wilſon exhibited ſome experiments, in which a point was ſtruck at a greater diſtance than a ball; whence he concluded, that as the point would attract the lightning from a greater diſtance, a blunt termination ought to be preferred, ſince, in certain caſes, it would avoid a ſtroke of lightning, which the pointed termination would not. (Phil. Tranſ. for 1778). Mr. Nairne, on the other hand, ſhewed ſome experiments, in which a ball was ſtruck in preference to a point. And this indeed is confirmed by a great variety of other experiments. In ſhort, a pointed conductor will draw the electric fluid from an incomparably greater diſtance than a blunt one; but it will draw that fluid gradually, in a ſtream, or ſilent manner; whereas the blunt termination will receive it in a full ſpark, or at once; hence a pointed conductor will tend to diminiſh the quantity of electricity in a cloud, previous to its coming too near, and thus it may protect a greater extent of building than a conductor with a blunt termination, ſince the object of fixing a conductor to a houſe is to protect the houſe from the effects of lightning, and not the conductor from tranſmitting the matter of the lightning.

Upon the whole, conſidering the immenſe quantity of electricity in a thunder cloud, and the little difference between the action of a blunt or a ſharp conductor with reſpect to that quantity, the difference of thoſe terminations ſeems to be of leſs conſequence than it was apprehended in the fervour of the diſpute. After all the experiments and the diſcuſſions made for the purpoſe, "A conductor," Mr. Cavallo obſerves, "to guard a building, as it is now commonly uſed in conſequence of ſeveral conſiderations and experiments, ſhould conſiſt of one iron rod, (copper would do much better, it being a more perfect conductor of electricity, and at the ſame time not being ſubject to contract ruſt ſo ſoon as iron), about three quarters of an inch thick, faſtened to the wall of the building, not by iron cramps, but by wooden ones. If the conductor were quite detached from the building, and ſupported by wooden poſts at the diſtance of one or two feet from the wall, it would be much better for common edifices; but it is more particularly adviſable for powder-magazines, powder-mills, and all ſuch buildings as contain combuſtibles ready to take fire. The upper end of the conductor ſhould be terminated in a pyramidal form, with the edges, as well as the point very ſharp; and if the conductor be of iron, it ſhould be gilt or painted for the length of one or two feet. This ſharp end ſhould be elevated above the higheſt part of the building, (as above a ſtack of chimnies, to which it may be faſtened), at leaſt five or ſix feet. The lower end of the conductor ſhould be driven five or ſix feet into the ground, and in a direction leading from the foundations; or it would be better to connect it with the neareſt piece of water, if any be at hand. If this conductor, on account of the difficulty of adapting it to the form of the building, cannot conveniently be made of one rod, then care ſhould be taken, that where the pieces meet they be made to come in as perfect a contact with one another as poſſible; for the electricity finds conſiderable obſtruction where the conductor is interrupted. For an edifice of a moderate ſize, one conductor, in the manner already deſcribed, is perhaps ſufficient; but, in order to ſecure a large building from ſuſtaining any damage by lightning, there ſhould be two, three, or more conductors, in proportion to the extent of the building.

"In ſhips a chain has often been uſed for this purpoſe, which, on account of its pliableneſs, has been found very convenient, and eaſy to be managed among the rigging of the veſſel; but as the electricity finds a great obſtruction in going through the ſeveral links, for which reaſon chains have been actually broken by the lightning, ſo their uſe has now been almoſt entirely laid aſide; and in their ſtead, copper wires, a little thicker than a gooſe-quill, have been ſubſtituted, and have been found to anſwer very well. One of thoſe wires ſhould be elevated two or three feet above the higheſt maſt in the veſſel; this ſhould be continued down the maſt, as far as the deck, where, by bending, it ſhould be adapted to the ſurface of thoſe parts, over which it may moſt conveniently be placed, and, by continuing it down the ſide of the veſſel, it ſhould be always made to communicate with the water of the ſea."

Another precaution muſt be added to the above directions, which is, that a communication ſhould be made between the conductor, and all other pretty large pieces of metal in the building, ſuch as leaden ſpouts, large iron clamps, &c.; for otherwiſe a lateral exploſion may take place between thoſe detached pieces of metal, at the time that the lightning is conveyed by the conductor, and thence the building may receive ſome damage, though not in a very great degree, unleſs indeed in caſe of powder mills and powder-magazines. See LATERAL EXPLOSION.

It is owing to this circumſtance, that ſome buildings furniſhed with a conductor or two, are ſaid to have been ſtruck and to have been damaged by a ſtroke of lightning. See Phil. Tranſ. vol. lxxii.

The ſize of the conductor, as recommended in the preceding paragraphs, has by ſome been thought too ſmall for the purpoſe; and an inſtance is recorded of a conductor of iron, four inches wide, and half an inch thick, which is ſaid to have been made red hot by a ſtroke of lightning. But with reſpect to this remark, we ſhall briefly obſerve, that ſhould any perſon think that the conductor, as directed above, is not large enough, the enlargement of its ſize is attended with no other inconvenience than an increaſe of expence. However, though a conductor be made red hot, and even melted by a ſtroke of lightning, yet it will effectually convey that ſtroke of lightning to the ground without any material injury to the building, as has been ſufficiently proved by experiments with artificial electricity, as well as with caſes of conductors partly melted by the lightning.

CONDUCTORS *of heat.* When a congeries of bodies remains long in a given degree of temperature, theſe bodies will all acquire the ſame apparent degree of heat; that is, the thermometer placed in contact with any of them, will riſe to the ſame degree; and in this caſe of equilibrium there is no reaſon to believe that any heat, or of caloric, paſſes from one body to another; but if a body, at a certain temperature, be placed amongſt bodies of a different temperature, the caloric will, in this caſe, be communicated from the former to the latter, or *vice verſâ;* according as the temperature of the former is higher or lower than that of the latter. This communication or paſſage of heat from one body to another, is made either by *contact* or by *radiation.*—*By contact*, when the bodies, which are contiguous to the hotter one, are progreſſively heated; *viz.* the neareſt firſt, and then thoſe which are farther off, without any interruption; as when a red-hot piece of iron is placed amongſt other pieces of colder iron, the heat is gradually communicated from the red hot one to the others.—*By radiation*, when the heat from a hot body paſſes through a vacuum, or through tranſparent bodies, which are not heated by it, yet it elevates the temperature of bodies placed at ſome diſtance. Thus, the ſolar heat radiates freely through air, glaſs, water, &c., and heats opaque bodies without ſenſibly affecting the tranſparent bodies through which it paſſes. Thus alſo, a thermometer ſuſpended under the exhauſted receiver of an air-pump, or in the Torricellian vacuum, continues to vary its temperature with that of the ſurrounding bodies.

In the communication of heat from one body to another, when a third body is interpoſed, it has been obſerved that the tranſition of heat is much quicker when certain bodies are interpoſed, than when other bodies are placed between; but there are no bodies known which prevent that tranſition effectually; hence the bodies of the univerſe are diſtinguiſhed into more or leſs perfect conductors of heat, but they afford no inſtance of a perfect non-conductor.

The tranſmiſſion of heat from a ſolid at a higher degree of temperature, to another at a lower one, in a given time, is nearly proportional to the difference of their temperatures. But the velocity with which heat is propagated through the ſubſtance of different bodies, varies conſiderably according to the nature of thoſe bodies. In general, metallic bodies are the beſt conductors of heat; ſtones, or hard earthy bodies come next; then the vitreous ſubſtances, and the reſinous. Dry animal parts, excepting bones, and eſpecially dry and light vegetable bodies, are bad conductors of heat. The conducting power of liquids is of a particular nature, which will be mentioned preſently. But the different bodies of the ſame claſs differ conſiderably in conducting power. Thus the metals poſſeſs it in different degrees, and their proportional powers were thus eſtimated by Dr. Ingenhouſz. He procured equal cylinders of ſeveral metallic ſubſtances, and having coated them with wax, he plunged their extremities in hot water, and judged of the conducting power of each, by the length of the wax-coating that was melted. The reſult of theſe experiments is expreſſed in the following liſt, which commences with the beſt conductors. Journ. de Phyſ. 1789, p. 68.

Silver.
Gold.
Copper. } nearly equal.
Tin. }
Platina. }
Iron. } much inferior to the others.
Steel. }
Lead. }

In the ſame paper, the proportional conducting powers of three fluids are ſtated in the following manner:

	Equal bulks.	*Equal weights.*
Water - -	1.	1.
Mercury -	2.	4.8
Linſeed oil -	1.111	1.085

The conducting power of the ſame body does not remain invariably the ſame in all circumſtances; but it differs, according as the body changes its ſtate of exiſtence, ſo that the conducting power of a body in a ſolid ſtate is different from that of the ſame body in a fluid ſtate. And at the time of changing its ſtate of exiſtence, the conducting power in moſt caſes ceaſes altogether. Thus, at the temperature of 60°, ſulphur is a conductor; but when heated to 212°, at which point it melts and becomes volatile, it is no longer a conductor. Thus alſo, ice conducts at the temperature of 20°, or at any other temperature below the freezing point, which is 32°; but at that point it ceaſes to be a conductor, becauſe the heat which may be communicated to it is abſorbed as an ingredient neceſſary to its fluid ſtate, which it aſſumes at, or little above, that point.

Rarefaction or condenſation alters the conducting powers of ſeveral bodies. Yet the rarefaction of air is by no means accompanied with a proportionate diminution of its conducting power.

Profeſſor Pictet ſuppoſes that heat aſcends within ſolid bodies more readily than it deſcends; *viz.* that in communicating heat to a ſolid body by the lateral application of a hotter body, the upper parts of the former are heated ſooner than the lower. This effect, however, may with propriety be attributed to the aſcending current of heated air which riſes along the ſurface of the body, and cauſes colder air to approach the lower part of the body; hence the heat is continually carried upwards.

The conducting power of a body changes likewiſe, in conſequence of an alteration of the ſurface; ſo that poliſh and figure are likewiſe concerned in the reception as well as in the propagation of heat. Theſe particulars, however, together with the reflection and refraction of heat, from the ſurface or through the ſubſtance of bodies, will, with more propriety, be explained under the article HEAT.

Fluids are, upon the whole, very imperfect conductors of heat, and Count Rumford was led, by his experiments, to conclude that heat is not at all propagated through them by contact, as it is in ſolids. (See Rumford's paper on the Conducting Property of Fluid, &c. Phil. Tranſ. 1805.). Whatever permits or promotes the motion of the particles of a fluid, contributes to the propagation of heat;—whatever obſtructs that motion, retards the propagation of heat through them. The particles of air which come in contact with an heated body, being thereby heated and rarefied, become ſpecifically lighter than the ſurrounding air, and of courſe aſcend; other air then comes in contact with the heated body, and this alſo being heated is cauſed to aſcend, and ſo forth. Thus is heat conveyed from the original hot body, by the air, to a diſtance from it; but if that motion of the air be obſtructed, as by the interpoſition of partitions of paper, wool, cotton, furs, and the like, then the communication of heat is prevented more or leſs effectually. It is principally on this account, that furs, feathers, eider down, cotton, and other ſimilar things, form warm coverings; *viz.* becauſe, by preventing in great meaſure the motion of the air between their filaments, they prevent at the ſame time the diſſipation of heat.

The like obſervations are applicable to water, and perhaps to all other fluids. When a veſſel full of water is ſet upon the fire, the particles of water that are cloſe to the bottom of the veſſel are firſt heated and rarefied; in conſequence of which they aſcend, and other colder particles take their place, which, being heated, likewiſe aſcend, and ſo on. If the fire be applied to the upper part of the water, the fluid will not be heated, or at moſt it will in a very ſlight degree. Count Rumford (ſee his 7th Eſſay) confined a piece of ice at the bottom of a pretty tall glaſs veſſel full of water nearly boiling, and noted the time it took up to melt the ice. The experiment then was repeated with this difference, *viz.* that a ſimilar piece of ice was placed on the ſurface of the hot water, inſtead of the bottom. It was found that the ice melted more than eight times quicker in this laſt ſituation than in the former. The reſult of this remarkable experiment is explained in the following manner. When the ice ſwims on the ſurface of the hot water, the particles of the latter, that are contiguous to the ice, being cooled by it, deſcend, and other hot particles of water take their place, which depoſit their heat upon the ice, and, being thereby rendered ſpecifically heavier than the next particles of watert alſo deſcend, and ſo forth. But when the ice is confined a, the bottom of the veſſel, the particles of hot water which come firſt in contact with it, are cooled, and are rendered ſpecifically heavier, in conſequence of which they remain in their place, and no motion will take place within the water; hence the ice is not melted nearly ſo readily as in the former ſituation. Now count Rumford contends that it is by means of the above-mentioned motion only that heat is propagated through fluids, and not otherwiſe. This concluſion was no ſooner publiſhed to the ſcientific world, than it was oppoſed in an able manner by very ſkilful philoſophers. See Dalton's paper. Nich. Journ. vol. iv. p. 75. Traill's paper, ibid. for 1805, p. 133: and Murray's paper, ibid. vol. i. From theſe papers we ſhall make the following abridged extracts, which ſeem neceſſary for the elucidation of the ſubject; and in the firſt place we ſhall ſtate Mr. Murray's experiments.

Into a glaſs cylindrical veſſel water was poured, till it covered the bulb of a thermometer; its temperature was 46°, which was likewiſe the temperature of the air of the room. One ounce of olive oil, heated to 140°, was poured on a ſmall piece of cord, ſuſpended on the ſurface of the water, and the cord was ſlowly withdrawn. Any motion of the water was thus avoided. In the courſe of a minute the thermometer began to riſe ſlowly; in five minutes from the commencement of the experiment, it had riſen 4°, in ten minutes $6\frac{1}{2}$°, in fifteen minutes 8°. It then became ſtationary, and continued ſo for ſeven minutes, before it began to fall. Its deſcent was ſlow. This experiment was repeated with a hot metallic ball (inſtead of oil) immerſed in the water above the thermometer, and it was attended with a ſimilar effect.

From theſe reſults the concluſion might ſeem juſt, that the fluid muſt poſſeſs a conducting power. Yet this is rendered doubtful by the circumſtance, that in all experiments of this kind, a quantity of caloric muſt be conveyed by the ſides of the veſſel. In order to avoid this ſource of error, Mr. Murray employed a veſſel of ice. But water could not be uſed in this caſe, becauſe that fluid expands from 40° to 32°; therefore oil and mercury were uſed.

A quantity of almond oil was poured into the ice veſſel, ſo as to cover the bulb of the thermometer a quarter of an inch. A ſmall cylindrical iron cup, two inches in diameter, and having a flat bottom, capable of holding two ounces by meaſure, was ſuſpended ſo as merely to touch the ſurface of the oil, and was filled with boiling water. At the beginning of the experiment, the thermometer ſtood at 32°. In a minute and a half it had riſen to $32\frac{3}{4}$°, in three minutes to $34\frac{1}{2}$°, in five minutes to $36\frac{1}{4}$°, in ſeven minutes to $37\frac{1}{2}$°. At this point it became ſtationary, having riſen $5\frac{1}{2}$° in ſeven minutes. The temperature of the water in the cup had in this time fallen to 96°. The thermometer, after remaining ſtationary at $37\frac{1}{2}$° for ſix minutes, began to fall, and it continued to deſcend at the rate nearly of a degree in a minute and a half, till it returned to 32°. The experiment was repeated with this variation, *viz.* that the thermometer was placed lower, ſo that half an inch of oil ſtood over its bulb. It was alſo repeated with mercury inſtead of oil. But in both caſes the reſults were ſimilar to that of the firſt experiment.

"This riſe," Mr. Murray ſays, "it appears to me impoſſible to aſcribe to any other cauſe than to a power in the fluid to conduct caloric. Thus it is evident, that the ſides of the veſſel could not convey to the fluid in contact with the bulb of the thermometer any part of the caloric it received. Ice, in common with any other ſolid, may, at temperatures below its melting point, conduct caloric; but as it cannot poſſibly exiſt with a temperature above 32°, it cannot communicate any temperature above that to a fluid in contact with it, and conſequently it could not contribute in the above experiment to raiſe the thermometer above that temperature. Caloric does not radiate through tranſparent fluids, and it cannot even be ſuppoſed capable of paſſing by radiation through an opaque fluid as mercury.

If it be proved that oil and mercury are capable of conducting caloric, it will be admitted as ſufficiently probable, that other fluids may have a ſimilar power. Of theſe two, mercury, it is probable from theſe experiments, is the beſt conductor, as the riſe of the thermometer took place in it much more rapidly than in the oil."

Dr. Traill's experiments for aſcertaining the conducting powers of divers fluids, were performed in the following manner.

A cylindrical veſſel was turned out of wood, having its ſides half an inch thick, its height four inches and its diameter two. It has a moveable wooden top or cover, perforated with a hole in its centre, a little more than an inch in diameter, into which an iron cylinder, of one inch in diameter, could be eaſily introduced. This cylinder is ſupported by a ſlight flanch, or ſhoulder-piece, and can be taken up by means of a ſtring attached to its top. When the iron bar is in its place, its flat lower extremity is half an inch diſtant from the bulb of a delicate mercurial thermometer, which is fixed by wax in a hole perforating the cylinder near its bottom. This thermometer is bent to a right angle, ſo that its bulb and part of its ſtem lie in the axis of the wooden cylinder. This ſhape was preferred, becauſe the ſtem could be little affected by the caloric tranſmitted by the ſides of the veſſel, till after the bulb was acted on by the caloric of the iron bar.

A variety of experiments was performed with this apparatus in the following manner: The temperature of the room being ſteadily 67°, Fahren. therm.; during the trials, a kettle of water was kept boiling over the fire. Its temperature was between 211° and 212°, and in this the cylinder of iron was ſuffered to remain, at each experiment, for fifteen minutes. The liquid to be examined, and all the apparatus (but the iron bar) were at each experiment aſcertained to be at 67°. The liquid was poured into the wooden veſſel, till it could riſe $\frac{1}{10}$ of an inch on the ſide of the iron cylinder when in its place. The wooden top was put on, and the iron was drawn out of the kettle of boiling water by means of the attached ſtring, and inſtantly let down through the hole of the cover. The time the thermometer took to riſe through 3° (*viz.* from 67° to 70°) was accurately marked by means of a ſtop-watch, and the reſults of the experiments on ſeveral fluids, are exhibited in the following table.

Liquids.	Minutes.	Seconds.
Water - - - -	7	5
Cow-milk - - - -	8	25
Proof ſpirit - - - -	8 nearly	
Alcohol. Lond. Pharmac. - - -	10	45
Tranſparent olive oil - - -	9	50
Mercury - - - -	9	15
Solution of ſulphate of iron. Salt 1. Water 5.	8	
Saturated ſolution of ſulphate of alumine -	9	40
Saturated ſolution of ſulphate of ſoda -	6	30
Aqua potaſſ. pura. London Pharm. -	8	15
Saturated ſolution of ſulphate of ſoda, but the liquid not touching the iron cylinder, by $\frac{1}{10}$ of an inch, or nearly ſo -	19	20

"If I am not deceived," ſays Dr. Traill, "we may conclude, from what I have above adduced, that liquids, as well as ſolids, are conductors of caloric; that the tranſmiſſion of it through them follows a particular law depending on the properties of the particular liquid; but which is not in the exact ratio of any of their mechanical properties, though nearer that of their denſity, than any other."

A circumſtance, deſerving the attention of the ſpeculative philoſopher, reſpecting the conductors of electricity and of heat, has been obſerved; *viz.* that moſt of thoſe bodies which are good conductors of the one, are likewiſe good conductors of the other. This law, however, is not without exceptions. Thus, metallic bodies are good conductors of both; but charcoal is a good conductor of electricity, though a very bad conductor of heat.

The laſt particular, which we ſhall briefly notice, with reſpect to the conductors of heat, is their uſe. This, on the leaſt examination, will be found to be very extenſive. Nature and art avail themſelves of theſe peculiar properties of bodies, and without them both animal and vegetable life could not ſubſiſt. The atmoſpherical fluid which envelopes the earth, is a very bad conductor of heat, undoubtedly created for the purpoſe of not diſſipating the heat of the earth and terreſtrial bodies. The coverings of animals, ſuch as furs and feathers, being extremely bad conductors, confine the heat on the animal body. The bark and ligneous part of plants, in conſequence of their imperfect conducting powers, tend to prevent the freezing of vegetable juices. The induſtry of man has not omitted to uſe the worſt conductors of heat for coverings, for the defence of his habitations, for the confinement of heat in certain furnaces, &c. In ſhort, numerous and admirable effects are deduced by Providence, and ſeveral eſſential advantages are obtained by art, from a proper application of the various conducting powers of natural bodies.

CONDUCTORS, in the *Military Art*, are aſſiſtants to the commiſſary of ſtores in conducting depots and magazines from one place to another. They take charge of the ammunition waggons in the field, make their reports to the commiſſary, and are under his authority and command.

CONDUCTOS *ad proficiſcendum*, in *Law*. See CAPIAS.

CONDUIT, a canal, or pipe, for the conveyance of water, or other fluid matter.

In the earth are ſeveral ſubterraneous conduits, through which the waters paſs that form ſome SPRINGS; and through which alſo paſs the vapours which form METALS and MINERALS.

Artifical conduits for water are made of lead, ſtone, caſt iron, potter's earth, &c. See PLUMBERY.

In the province of New Mexico, there is ſaid to be a ſubterraneous conduit, in form of a grotto, extending ſix hundred miles in length. See DUCT, TUBE, &c.

CONDUITE *d'une Troupe.* A *troop* that marches has always an officer, who commands independently of the other officers that may accompany it.

CONDUSKEEG, in *Geography*, a ſettlement of America, in the diſtrict of Maine and Hancock county, containing 567 inhabitants.

CONDYLÆ, in *Ancient Geography*, a town of Arcadia, near Caphia, and N.W. of Orchomenæ. In this town was a temple of Diana, and near it a grove. Pauſanias.

CONDYLE, in *Anatomy*, an appellation beſtowed on ſeveral projections of the bones.

CONDYLOMA, from κόνδυλος, *digiti articulus*, in *Surgery*. By this term is underſtood almoſt every hard excreſcence or ſarcoma, that appears in the parts about the anus and the pudenda of both ſexes; which is generally painful, or at leaſt troubleſome, and ſometimes of a venereal origin. According to the different forms which ſuch excreſcences aſſume, they are termed *condylomata, fici, cristæ, verrucæ, framboeſiæ, &c.*; however they do not materially differ, being all of the ſame nature, and requiring the ſame mode of treatment. They are diſtinguiſhed from the hæmorrhoids by their ſituation, irregular form, the conſtant preſſure which they produce, their generally fungous texture, and the foul matter which is frequently diſcharged from their ſurface, or by the venereal ſymptoms with which they are accompanied. In ſome caſes they are not harder than the parts upon which they are ſituated; ſometimes, however, they are harder than the moſt complete ſcirrhus. With reſpect to their colour, they are, in ſome caſes, of a pale white, in others more or leſs red. Sometimes they are found ſingle; but generally the whole of the parts about the anus becomes covered with them. Frequently they are not larger than common warts; which, when the diſeaſe has proceeded to a great height, become more numerous, and adhere to or are in contact with each other. In other caſes, theſe excreſcences are from the beginning broad and flat, and frequently of the ſize of a large bean ſplit in half. Sometimes they hang, like figs, on a ſlender ſtalk. Theſe excreſcences are in general more troubleſome than dangerous; however, the ſyphilitic virus by which they may have been produced is what is moſt to be feared.

In the cure of theſe excreſcences, the principal object is to remove the cauſe, eſpecially when of a venereal kind; and they are either local affections, or, which is ſometimes the caſe, effects of a depraved ſtate of the body. After the appropriate internal remedies (ſee SYPHILIS) have been adminiſtered, they frequently dry up of themſelves, and when they remain, they muſt be treated with topical corroſive applications. When theſe excreſcences are of a ſofter conſiſtence, and their ſurface ſore or ulcerated, we may mix Aq. calcis. with Spir. vin. Camph. and Tinct. myrrhæ, and apply this mixture ſeveral times a day to the excreſcences, by means of a hair-pencil, or cover them with compreſſes dipped in it. Still greater effects are produced by the fine powder of ſavine ſprinkled frequently upon them; this powder may alſo be mixed into an ointment with precipitate of mercury, and ſpread upon the excreſcences. Or they may be ſprinkled once or twice a day with the powder, and a ſaturnine cerate with opium afterwards applied. In various caſes, the following corroſive waſh of Mr. Plenk has been found the moſt effectual remedy: ℞. Spir. Vin. rect. Acet. vin. concentrat. aā ℥ſs. Merc. ſubl. corroſiv. ʒj. Alum. crud. Camph. Ceruſs. aā ʒſs. M. D. S. To be rubbed twice or thrice a day upon the excreſcences, which are to be covered during the intervals with Ungt. ex Hydrargyro.

Frequently the excreſcences diſappear without ſuppurating, and the ſound ſkin is not injured. Mercurial fumigations with cinnabar are likewiſe recommended as powerful remedies. The aqua phagedænica has ſometimes been found very effectual in removing very ſmall venereal warts.

If the excreſcences do not yield to the uſe of any of theſe remedies, but remain hard, callous, and fungous, we may apply the following: Triturate Merc. ſublim. corroſiv. ʒſs. in a marble mortar, and add gradually Spir. nitr. fumant. ℥ſs. The application of this remedy, which is to be applied every day, or every other day, muſt be performed with the utmoſt caution, by means of a hair-pencil, with which it is to be rubbed upon the ſummit of the excreſcence. We may alſo employ the *lunar cauſtic,* alſo the *lap. infern.* or Butyr. antimon., which are likewiſe to be applied in a very cautious manner; and we ought particularly to take care not to let any part of them come into contact with the rectum, which would produce very dangerous conſequences. The extirpation by means of ligatures may be employed when the number of the excreſcences is but ſmall, and they hang by ſmall ſtalks to the ſurface; for otherwiſe it is a painful remedy. The moſt certain method of removing them is by means of the knife, only they frequently grow again within a ſhort time; nor ought this remedy to be employed in venereal caſes, till a ſufficient quantity of mercury has been adminiſtered. In cutting them off, all the adjacent diſeaſed parts muſt be taken away; and in order to prevent inflammation, the blood may be ſuffered to flow for ſome time, after which the parts may be covered with lint, and treated as a common wound.

CONDYLON, in *Ancient Geography*, a fortreſs of Greece, between Connas and Tempé, towards Theſſaly.

CONE, in *Geometry*, a ſolid body, having a circle for its baſis, and terminated at the top in a point, or vertex. See *Plate* I. *Conics*, *fig.* 4.

The cone is generated by the motion of a right line, KM, round an immoveable point, K, called its *vertex*, along the circumference of a plane, called its *baſe*, MN: or it may be conceived as generated by the revolution of the triangle, KLM, about the right line, KL, which is called the *axis* of the cone, and KM its latus or ſide. If the axis be perpendicular to the baſe, it is ſaid to be a *right* cone: and if inclined, or oblique, an *oblique* or *ſcalenous* cone. *Scalenous* cones are again divided into *obtuſe-angled*, and *acute-angled*.

An *equilateral* cone, is a right cone, whoſe ſide is equal to the diameter of the baſe.

Euclid defines a cone a ſolid figure, whoſe baſe is a circle, as CD (*fig* 5.), and is produced by the entire revolution of the plane of a right-angled triangle CAB, about the perpendicular leg AB.

If this leg, or axis, be greater than CB, half the baſe, the ſolid produced is an *acute-angled* cone; if leſs, it is an *obtuſe angled* cone; and, if equal, a *right angled* cone.

But Euclid's definition only extends to a *right* cone; that is, to a cone whoſe axis is at right angles to the baſe; and not to oblique ones, whoſe axis is not at right angles to the baſe.

For a more general and comprehenſive deſcription of a cone, which may take in both right and oblique ones, ſuppoſe an immoveable point A (*fig.* 6.), without the plane of the circle BDEC; and ſuppoſe a right line, AE, drawn through that point, and produced infinitely both ways, to be moved quite about the circumference of the circle; the two ſuperficies that will ariſe from this motion are each called *conic ſuperficies*; but, taken conjunctly, they are called *ſuperficies vertically oppoſite*, or only *oppoſite ſuperficies*. The immoveable point, A, common to both the ſuperficies, is called the *vertex*; the circle BDEC, the *baſe*; the right line AC, drawn through the vertex A, and C, the *centre of the baſe*, and if infinitely produced, the *axis*; and the ſolid, comprehended under the conical ſuperficies and the baſe, is a *cone*.

Cone, *Properties of the.*—1. *The area or ſurface of every right cone, excluſive of its baſe, is equal to a triangle whoſe baſe is the periphery, and its height the ſlant ſide of the* cone.

Take the very ſmall arc IK (*fig.* 7.), and draw AI, AK. Then the part of the ſurface AIK coincides with the ſmall iſoſceles triangle AIK, whoſe baſe is IK, and height AI. In like manner, the whole ſurface of the cone may be ſuppoſed to conſiſt of ſuch triangles whoſe common height is AI, and baſes ſo many KI's as are contained in the circumference of the baſe, all which triangles are equal to the triangle whoſe height is AI, and baſe, the ſum of all the KI's, or the circumference BKDB. Hence, the curve ſurface of a right cone is equal to half the rectangle of the ſide AB, and circumference of the baſe, BKDB. For the half of that rectangle is equal to a triangle of the ſame baſe and height. Moreover, the curve ſurface of a right cone is equal to a circle, whoſe radius is a mean proportional between the ſide AB, and the radius of the baſe BC. For the conic ſurface is $= \frac{AB \times BKDB}{2}$, and the area of the baſe $BD = \frac{BC \times BKDB}{2}$ (ſee Circle). Let the radius, R, repreſent the mean proportional between AB and BC, or let $R = \sqrt{AB \times BC}$; and the area of the circle whoſe radius is $R = A$. Then the conic ſurface : circle BD :: $\frac{AB \times BKDB}{2} : \frac{BC \times BKDB}{2}$ :: AB : BC :: $AB \times BC : BC^2$; and the circle BD : circle A :: $BC^2 : R^2$ or $AB \times BC$: conſequently the conic ſurface : circle A :: $AB \times BC : AB \times BC$, which is a ratio of equality: therefore the conic ſurface = circle A, whoſe radius is $\sqrt{AB \times BC}$. Hence alſo, the curve ſuperficies of a right cone is to the area of its circular baſe, as AC (*fig.* 5.), the length of the hypothenuſe of the right-angled triangle deſcribing it, is to CB, the baſe of the ſame triangle: that is, as the ſlant ſide of the cone, to the ſemidiameter of the baſe.

Hence alſo, the ſurface of a right cone is equal to a ſector of a circle deſcribed on the ſlant ſide of the cone, as a radius, whoſe arc is equal to the periphery of the baſe of the cone: and has therefore the ſame proportion to its periphery, which the diameter of the baſe has to twice the ſide of the cone. *Hence we have a method of deſcribing a rete or cage that ſhall juſt cover a* cone.—Thus, with the diameter of the baſe AB (*Plate*, *Conics*, *fig.* 8.), deſcribe a circle, and produce the diameter to C, till AC be equal to the ſide of the cone. To 2 AC and AB, determined in numbers, and 360°, find a fourth proportional: and with the radius CA, on the centre C, deſcribe an arc DE equal to the number of degrees found: the ſector CDE with the circle AB will be a rete for the right cone.

If, then, the ſide of a truncated cone be ſet off from A to F, and an arc GH be deſcribed with the radius CF; by finding a fourth proportional to 360°, to the number of degrees of the arc GH, and to FC; and thence determining the diameter of the circle IF, we ſhall have a net or cover of the truncated cone.

For CDBAE is a net for the entire cone; CGFIH for the cone cut off; therefore, DBEHIG for the truncated cone.

2. *Cones and pyramids, having the ſame baſes and altitudes, are equal to each other.*

Now, it is ſhewn, that every triangular priſm may be divided into three equal pyramids; and therefore, that a triangular pyramid is one third of a priſm, ſtanding on the ſame baſe, and having the ſame altitude.

Hence, ſince every multangular body may be reſolved into triangular ones, and every pyramid is a third part of a priſm, having the ſame baſe and altitude; ſince a cone may be eſteemed an infinite-angular pyramid, and a cylinder an infinite-angular priſm; a cone is a third part of a cylinder, which has the ſame baſe and altitude. Hence, cones of equal baſes are as their heights; cones, and alſo fruſtums of cones, of equal altitudes, are as the baſes: cones are to one another in the compound ratio of the baſes and heights: and in equal cones, the baſes and heights are reciprocally proportional.

Hence we have a method of meaſuring the ſurface and ſolidity of a cone. Thus, *for the ſolidity:* find the ſolidity of a priſm, or cylinder, having the ſame baſe with the cone, or pyramid, or, multiply the baſe by the altitude: then divide by 3: the quotient will be the ſolidity of a cone, or a pyramid. Thus, *v. gr.* if the ſolidity of a cylinder be 605592960, the ſolidity of the cone will be found 201864320.

For the ſurface; that of a right cone is had by multiplying the ſemi-periphery of the baſe into the ſide, and adding the product to the baſe.

All cones, which have their altitudes and the diameters of their baſes reciprocally proportional, are in the triplicate ratio of their altitudes, being to each other in the ſame proportion with priſms of equal baſe and altitude, of which they are like parts. See Prism.

Suppoſe, *e. gr.* the diameter of the cone NM (*fig* 4.) 56, the periphery will be 175,9296, and the baſe 2463,0144. Suppoſe the altitude or axis KL, 246; ſince $LM = \frac{1}{2} NM = 28$, and $KM^2 = KL^2 + LM^2 = 60516 + 784 = 61300$, $KM = 247{,}5$, &c. Conſequently the ſuperficies of the cone, excluſive of the baſe, is 21771,288; and the whole together 24234,3024.

The ſolidity of an oblique cone is obtained in the ſame manner with that of the right cone: but it is much more difficult to find its ſurface, ſince it cannot be reduced to the meaſure of a ſector of a circle, becauſe all the lines drawn from the vertex to the baſe are not equal. See a Memoir on this ſubject, by M. Euler, in the Nouv. Mem. de Peterſburgh, tom. i. Dr. Barrow has demonſtrated, in his Lectiones Geometricæ, that the ſolidity of a cone with an elliptic baſe, forming part of a right cone, is equal to the product of its ſurface by a third part of one of the perpendiculars drawn from the point in which the axis of the right cone interſects the ellipſe; and that it is alſo equal to one third of the height of the cone multiplied by the elliptic baſe: and therefore that the perpendicular is to the height of the cone, as the elliptic baſe to the ſurface.

For the meaſure of the ſurface, and ſolidity of a truncated cone, or *fruſtum*, ABCD (*fig.* 8). Its altitude CH, and the diameters of its baſes AB and CD, being given, find their circumferences; to the ſquare of the altitude CH, add the ſquare of the difference of the radii AH, and from the aggregate extract the ſquare root, which will give the ſide AC: the ſemi-ſum of the peripheries, multiplied by that ſide, gives the ſuperficies of the truncated cone or fruſtum.

To find the ſolidity: as the difference of the ſemi-diameters AH, is to the altitude of the truncated cone or fruſtum CH, ſo is the greater ſemi-diameter AF to the altitude of the entire cone FE. This being found, ſubtract the altitude of the truncated cone GF, which will leave that of the cone taken off, EG.

Find the ſolidity of the cone CED and AEB; ſubtract the other from this; the remainder will be the ſolidity of the truncated cone or fruſtum ACDB. Or, add into one ſum the areas of the two ends of the fruſtum and the mean proportional between them; multiply that ſum by the perpendicular height, and $\frac{1}{3}^{d}$ of the product will be the ſolidity. For the method of finding the ſurface and ſolidity of a cone, &c. by fluxions; ſee Superficies and Solidity.

Cone, *Ungula of.* See Ungula.

For the ſections of the Cone, ſee Conic *ſection.—For the ratio of* Cones *and Cylinders*, See Cylinder.—*For the centres of gravity and of oſcillation of a* Cone, ſee Center.

Cones *of the higher kinds*, are thoſe whoſe baſes are circles of the higher kinds; and are generated by ſuppoſing a right line fixed in a point, on high, though conceived capable of being extended more or leſs, on occaſion; and moved or carried round the ſaid circle of the higher kind.

Cone *of rays*, in *Optics*, includes all the ſeveral rays which fall from any point of a radiant, on the ſurface of a glaſs.

Cone, *double*, or *ſpindle*, in *Mechanics*, is a ſolid formed of two equal cones joined at their baſes. If this be laid on the lower part of two rulers making an angle with one another, and elevated above the horizontal plane, it will move towards the raiſed ends, and ſeem to aſcend, though it really deſcends. Let ABD (*Plate* XVI. *Mechanics, fig.* 7.) be the common baſe of the two cones, its centre C will be the centre of gravity of the whole ſolid: therefore, if DF repreſents one of the rulers elevated to an angle FDG, whoſe ſine FG is leſs than the ſemidiameter of the cone CD, it is plain that the centre of gravity C at the poſition of the cone in D, is more diſtant from the centre of the earth, to which all heavy bodies tend, than in its poſition between the legs of the ruler at F; and therefore it will deſcend, as on an inclined plane CFE, from C to F, where it will ſtop, being ſupported on the raiſed ends of the rulers.

Cone, in *Aſſaying*. See Melting-*cone*.

Cone, in *Botany*, a hard dry ſeed-veſſel of a conical figure, conſiſting of ſeveral woody parts; and is, for the moſt part, ſcaly, adhering cloſely together, and ſeparating when ripe.

Cone-*ſtone*, in *Natural Hiſtory*, the name given by many to a ſpecies of tubulus *marinus*, not known to us in its recent ſtate, but frequently found foſſile in the Swediſh ſtones uſed in pavements.

Cone *and key*. Bracton, lib, ii. cap. 37. num. 3. ſays, *Fæmina in tali ætate* (*i. e.* 14. *et* 15. *annorum*) *poteſt diſponere domui ſuæ, et habere* cone *et* key.

The words come from the Saxon *colne*, i. e. *calculus*, and *key*, *clavis;* ſo that a woman was then held to be of competent years when ſhe was able to keep the accounts and keys of the houſe: and Glan. lib. vii. cap. 9. has ſomewhat to the ſame purpoſe.

Cone, in *Conchology*. See Conus.

CONECTE, Thomas de, in *Biography*, a monk of the order of the Carmelites, born in Bretagne, towards the cloſe of the fourteenth century, and diſtinguiſhed as the moſt popular and impreſſive preacher of his time. In his diſcourſes he did not confine himſelf to ſubjects of religion and morality, but he attacked with vehemence the reigning follies and faſhionable foibles of the age. The head dreſs of the ladies in particular was the ſubject of his repeated remonſtrances. At this period, ſays Bayle, "the head-dreſſes were of ſuch a prodigious height, that the higheſt top-knots now are but dwarfs to them." Conecte reformed that exceſs, and obliged the ladies to dreſs themſelves modeſtly and with a ſtrict regard to decorum. It was not, however, ſo much by the force of the reaſons with which he repreſented the evangelical duties, as by exciting boys and the commonalty to inſult thoſe of the other ſex, who would not introduce a reform into their dreſs. Whether, however, he aimed at vice or folly, he was ſo famed as an orator, that no churches were ſufficiently ſpacious to contain the crowds, that followed him wherever he went; he therefore choſe as theatres for the diſplay of his eloquence, public ſquares and other places where immenſe ſcaffolds were erected, from which he could make himſelf heard by many thouſands at the ſame time. When he travelled from place to place, it was on a mule attended with many monks and prieſts on foot. As ſoon as he arrived in the vicinity of any town, the moſt conſiderable perſons for rank and property came out to meet him, in order to conduct him to the houſe provided for his lodging, which was commonly the beſt in the place. His labours were not confined to his own country; from France he proceeded to the Netherlands, and Italy, exciting every where the ſame attention which he experienced in his native land. At Venice he gained ſo much reputation, that the embaſſadors from that republic to the pope, invited him to accompany them to Rome. But the freedom and aſperity of his declamations againſt the corruption of the clergy and the court, rouſed the reſentment, and paſſions of the papal ſee; he was accordingly tried and condemned for hereſy, and burnt at Rome in the year 1434. His motives were queſtioned by ſome of his contemporaries, but the readineſs with which he ſubmitted to a cruel death, in defence of his conduct, rather than retract the charges which he had exhibited againſt the profligacy of the Romiſh hierarchy, was ſufficient evidence of his ſincerity in a good cauſe. Bayle.

CONEGLIANO, Gio Batista Cima, called *Il*, from the place of his nativity, a ſmall city in the ſtate of Venice, became, under the tuition of Giovanni Bellini, a painter of conſiderable eminence; and indeed ſo entirely did Conegliano poſſeſs himſelf of the ſtyle of Bellini, that the works of the ſcholar are frequently confounded with thoſe of the maſter; even by good judges. It was however much the cuſtom with the older Venetian painters to ſubſcribe their names to their works; many therefore of this artiſt are ſtill known, as well by the inſcription as by the mountainous view of the town of Conegliano with which he uſually enriched his back grounds. A juvenile performance of this maſter with the date 1493, is in the duomo of Conegliano: a more excellent picture by him is in the church of Santa Maria dell' Orto, at Venice. It repreſents St. Peter, St. Paul, St. Mark, and St. Jerome, with a magnificent architectural back-ground. But in the opinion of Lanzi, the chef-d'ouvre of Conegliano is an altar-piece in the duomo at Parma, the ſubject of which however he has neglected to mention. This maſter is ſuppoſed to have died ſhortly after 1517. Lanzi. Storia Pittorica. Zanetti, Pittura Veneziana.

CONEGOCHEAQUE Creek, in *Geography*, a creek of America, which riſes near Marierſburg, in Franklin county and ſtate of Pennſylvania, runs ſoutherly in a winding courſe, and after ſupplying a number of mills, diſcharges itſelf into the Potowmack at William Port, in Waſhington county, Maryland; 19 miles S.E. of Hancock, and 8 miles S. of the Pennſylvania line.

CONEI or Cowne, George, a native of North Britain, and a zealous catholic, went to reſide at Modena, in Italy, at an early age. He afterwards ſettled at Rome, and was celebrated, during the pontificate of pope Paul V., for his profound knowledge of the Greek and Latin languages. His own good character recommended him to the patronage of the cardinals Montalto and Barberini. The latter being nephew to pope Urban VIII., Conei ſoon obtained ſo much of the favour and confidence of the pontiff as to be entruſted with the office of nuncio to Maria Henrietta, queen of England, which he diſcharged completely to the ſatiſfaction of the papal court. As a reward for his conduct he would have been raiſed to the dignity of cardinal, had not death cut off his proſpects. He died in 1640, at the age of forty-two; leaving behind him, among other works of merit, "The Life of Mary Stuart;" "De Inſtitutione principis;" "De Duplici Statu Religionis apud Scotos," &c. &c.

CONEMAUGH River, and *Little Conemaugh*, in *Geography*, are the head waters of Kiſkemanitas, in Pennſylvania. After paſſing through Laurel hill and Cheſnut ridge, Conemaugh takes that name, and diſcharges itſelf into the Alleghany, 29 miles N.E. of Pittſburgh. It is navigable for boats, and there is a portage of 18 miles between it and the Frankſtown branch of Juniata river.—Alſo, a town of Pennſylvania, 15 miles E. of fort Ligonier.

CONENTOS, Las, a city of La Plata or Paraguay, in South America, in the dioceſe of Buenos Ayres.

CONEPATL, in *Zoology*, an American animal of the weeſel kind mentioned by Hernand.; and alſo by Ray under the title of *Yzquipatl*. It is deſcribed as bearing a ſtrong reſemblanee to the racoon in ſhape, but variegated with two long ſtreaks of white, one on each ſide of the ridge of the back, which run even into the tail. This animal is ſaid to be of a harmleſs diſpoſition, but of a ſtinking ſmell, and when purſued, or provoked, will diſcharge its excrements at the perſon who offends it to ſix or eight feet diſtance; theſe have a very bad ſmell and ſpoil peoples cloaths by leaving indelible yellow ſpots on them. Little more is known of this animal than is above related. It inhabits New Spain, and was placed by Linnæus in his Syſtema as the ſame ſpecies with his Viverra Memphitis, the memphitic weeſel, and chinche of Buffon. Gmelin conſiders it as a diſtinct ſpecies, and deſcribes it ſpecifically under the name of conepatl. This animal may prove to be a variety only of the ſtriated weeſel, or perhaps only of the memphitic weeſel to which Linnæus at firſt aſſigned it. See Viverra.

CONERFREIT, in *Geography*, a town of Germany, in the circle of Bavaria, and Upper Palatinate; 34 miles N.N.E. of Amberg.

CONESSI, or Conesti, in the *Materia Medica*, a bark brought from the Eaſt Indies. It is frequent in Ceylon, and Malabar, where the natives take it in diarrhœas, lienteries, and dyſenteries. We uſe it in powder for the ſame purpoſes, the doſe being from half a dram to a dram. It is proper to give a doſe of ipecacuanha before taking it.

This tree grows alſo on the Coromandel coaſt, in the Eaſt Indies, and is not unlike the *cadagopala* of the *hortus Malabaricus*. The bark ſhould be freſh powdered, and the electuary prepared with ſyrup of oranges every day or every other day. Med. Eſſ. vol. iii. art. 4.

CONESTEO, in *Geography*, a north-weſtern branch of Tioga river in the ſtate of New York, America.

CONESTOGA, a townſhip of America, in the county of Lancaſter and ſtate of Pennſylvania.

CONESUS, a ſmall lake of America, in the county of Geneſſee and ſtate of New York, which conveys its waters N.W. to Geneſſee river.

CONFARREATION, a ceremony among the ancient Romans, uſed in the marriage of perſons whoſe children were deſtined for the honour of the prieſthood.

Confarreation was the moſt ſacred of the three modes of contracting marriage among that people; and conſiſted, according to Servius, in this, that the *pontifex maximus* and *flamen dialis* joined and contracted the man and woman, by making them eat of the ſame cake of ſalted bread; whence the term, *far* ſignifying meal or flour.

Ulpian ſays, it conſiſted in the offering up of ſome pure wheaten bread; rehearſing, at the ſame time, a certain formula, in preſence of ten witneſſes. Dionyſius Halicarnaſſeus adds, that the huſband and wife did eat of the ſame wheaten bread, and threw part on the victims.

CONFECTION, in *Pharmacy*, a kind of compound remedy, of the conſiſtence of a ſoft electary, or electuary.

Confections and electuaries are compoſed chiefly of powders, mixed up with ſyrups or honey, into ſuch a conſiſtence, that the powders may not ſeparate by keeping. They are chiefly the milder medicines, and ſuch as are not very ungrateful to the palate, that enter into the compoſition of the electuaries; for as they are taken ſomewhat "ad libitum," it would be unſafe to truſt this mode of exhibition of the more active drugs. The lighter powders require about twice the weight of ſyrup to be brought to the proper conſiſtence of an electuary. The ordinary doſe is a piece about the bulk of a nutmeg. See Electuary.

Several electuaries were formerly diſtinguiſhed by the name of confections; ſome of which, in the medical language, are *corroborative*, and others *purgative*.

Of the number of the corroborative confections, were thoſe of *alkermes*, of *hyacinth*, and the *anacardine:* a purgative one is the confection *Hamech*. The confection of *alkermes* has its name from the principal ingredients therein; which is the *kermes*, or *alkermes*, or ſcarlet-grain. The other ingredients were pearls, muſk, cinnamon, ambergris, leaf-gold, juice of pippins, and roſe water. It was ranked among the beſt cardiacs, and frequently uſed for the palpitation of the heart, or ſyncope; and ſometimes in the ſmall-pox and meaſles.

The confection of *hyacinth* was ſaid to have nearly the ſame virtues with that of *alkermes;* but, beſides, it was frequently uſed as an aſtringent. It conſiſted of nearly triple the number of drugs; whereof the precious ſtone, called the *hyacinth*, was eſteemed the principal; the chief of the reſt were, red coral, bole armoniac, terra ſigillata, myrrh, the ſantals, burnt hartſhorn, camphire, ſapphire, emerald, topaz, and moſt of the ingredients of the confection of alkermes. The *anacardine* confection was compoſed chiefly of anacardiums; whence the name. The other drugs were long pepper, black pepper, moſt kinds of myrobalans, caſtoreum, &c. It was uſed to purge the blood, and deemed proper in cold diſeaſes.

The confection *Hamech*, took its name from that of its inventor, an Arabian phyſician. Its ingredients were, polypody, myrobalans, agaric, ſenna, tamarinds, red roſes, manna, colocynth, &c. It was applied as a draſtic for the purging of the groſſer humours and viſcidities; it was alſo of ſome reputation in vertigoes and cancers. But all theſe, though we have thought it proper to mention them, are excluded from the modern diſpenſatories.

CONFECTIO *aromatica*. See the next article.

Confectio *cardiaca*, a name given in the late London Diſpenſatory to the ſo much eſteemed medicine commonly known by the name of the *confectio Raleighana*, and now denominated *confectio aromatica*. The compoſition is alſo altered, as well as the name, and is ordered now to be made in the following manner: Take zedoary, in coarſe powder, and ſaffron, of each half a pound, and of diſtilled water, three pints. Macerate for twenty-four hours, and then preſs out and ſtrain. Evaporate the ſtrained liquor to a pound and a half, and add of compound powder of crabs-claws, ſixteen ounces by weight; cinnamon and nutmeg, of each two ounces by weight; cloves, one ounce by weight; leſſer cardamom, half an ounce by weight; and double refined ſugar, two pounds.

Powder the ſpices together very finely, and adding the ſugar, make a confection. This is an improvement of the *confectio cardiaca* of the former diſpenſatory. The eſſential oil of the cardamom appeared, on an experiment made at the Hall, to be loſt in the evaporation of the tincture; and, therefore, the cardamom is now more properly added in powder.

Confectio *Damocratis*. See Mithridate.

Confectio *Fracaſtorii*. See Diascordium.

Confectio *Japonica*, was prepared of Japan earth, three ounces; tormentil root, nutmeg, and olibanum, of each two ounces; opium, diſſolved in Liſbon wine, a dram and a half; ſimple ſyrup and conſerve of roſes, of each fourteen ounces. An electuary of theſe ingredients ſupplied the place of *diaſcordium;* and the doſe was from a ſcruple to a dram.

Confectio *Opiata*, confection of opium, is prepared in the following manner: Take of hard purified opium, powdered, ſix drams by weight; long pepper, ginger, and caraway, of each two ounces by weight; ſyrup of white poppy, boiled to the conſiſtence of honey, three times the weight of the whole. Mix the purified opium with the heated ſyrup, and add the reſt in powder.

Confectio *Paulina*, a name given in the late London Diſpenſatory to the compoſition which uſed to be called *confectio archigenis*. It was ordered to be made in the following manner: Take coſtus or zedoary, cinnamon, long pepper, black pepper, ſtrained ſtorax, galbanum, opium, and Ruſſia caſtor, of each two ounces; of ſimple ſyrup, boiled to the conſiſtence of honey, an equal weight to thrice the ſpecies. Pemberton's London Pharm. p. 339.

CONFECTOR, among the *Ancient Romans*, a ſort of gladiator, hired to fight in the amphitheatre againſt beaſts; thence alſo denominated *beſtiarius*. See Gladiator.

The confectores were thus called *à conficiendis beſtiis*, from their diſpatching and killing beaſts.

The Greeks called them ϖαραϐολοι, q. d. *daring*, *raſh*, *deſperate;* whence the Latins borrowed the appellations *parabolani*, and *parabolarii*. The chriſtians were ſometimes condemned to this ſort of combat.

CONFECTS, or Confits, a denomination given to fruits, flowers, herbs, roots, and juices, when boiled and prepared with ſugar, or honey, to diſpoſe them to keep, or render them more agreeable to the taſte.

The ancients only confited with honey; at preſent, ſugar is more frequently uſed. Confects half-ſugared are thoſe only covered with a little ſugar, to leave more of the natural taſte of the fruit.

Confects are reduced to eight kinds; viz. *liquid confects*, *marmalades*, *jellies*, *paſtes*, *dry confects*, *conſerves*, *candies*, and *dragees*, or *ſugar-plums*.

Liquid confects are thoſe whoſe fruits, either whole, in pieces, in ſeeds, or in cluſters, are confited in a fluid tranſparent ſyrup, which takes its colour from that of the fruits boiled in it. There is a good deal of art in preparing theſe well; if they be too little ſugared, they turn; and if too much, they candy. The moſt eſteemed of the liquid confects are plums, eſpecially thoſe called mirabels, barberries, quinces, apricots, cherries, orange flowers, little green citrons from Madeira, green caſſia from the Levant, myrobalans, ginger, cloves, &c.

Marmalades are a kind of paſtes almoſt liquid, made of the pulp of fruits, or flowers, that have ſome conſiſtence; ſuch as apricots, apples, pears, plums, quinces, oranges and ginger. Marmalade of ginger is brought from the Indies by way of Holland: it is eſteemed good to revive the natural heat in old men. See MARMALADE.

Jellies are juices of ſeveral fruits, wherein ſugar has been diſſolved, and the whole, by boiling, reduced into a pretty thick conſiſtence; ſo as, upon cooling, to reſemble a kind of thin tranſparent glue, or ſize. Jellies are made of various kinds of fruits, eſpecially gooſeberries, currants, apples, and quinces: there are other jellies made of fleſh, fiſh, hartſhorn, &c. but they are not to be kept, being very ſubject to corrupt. See JELLY.

Paſtes are a kind of marmalades, thickened to that degree by a proper boiling, as to aſſume any form, when put into little moulds, and dried in the oven. The moſt in uſe are thoſe of gooſeberries, quinces, apples, pears, and orange flowers: thoſe of piſtachoes are the moſt eſteemed; thoſe of ginger are brought from the Indies.

Dry Confects are thoſe whoſe fruits, after having been boiled in the ſyrup, are taken out again, and drained, and put to dry in an oven. Theſe are made of ſo many kinds of fruits, that it would be hard to explain them all: the moſt conſiderable are citron and orange-peel, plums, pears, cherries, apricots, &c.

Conſerves are a kind of dry confects, made with ſugar, paſtes of flowers or fruits, &c. The moſt uſual among theſe, are thoſe of roſes, mallows, roſemary; of heps, of orange flowers, violets, jeſſamin, piſtachoes, citrons, and ſloes.

Note. The apothecaries, under the title of *conſerves*, comprehend all kinds of confects, both dry and liquid; whether of flowers, fruits, ſeeds, roots, barks, or leaves, prepared with ſugar or honey, to preſerve, &c. See CONSERVE.

Candies are ordinarily entire fruits, candied over with ſugar, after having been boiled in the ſyrup; which renders them like little rocks cryſtallized; of various figures and colours, according to the fruits encloſed within them. The beſt candies are brought from Italy. See CANDY.

Sugar-plums are a kind of little dry confects, made of ſmall fruits or ſeeds, little pieces of bark, or odoriferous and aromatic roots, &c. incruſted and covered over with a very hard ſugar, ordinarily very white. Of theſe there are various kinds, diſtinguiſhed by various names; ſome made of raſberries, others of barberries, melon-ſeeds, piſtachoes, filberds, almonds, cinnamon, orange-peel, corianders, aniſeeds, caraways, &c.

CONFEDERACIES OF POLAND. See POLAND.

CONFEDERACY, Fr. *Confederation*, an alliance, compact, or league between different princes and ſtates, for the ſupport of a common cauſe. See CONFEDERATION.

CONFEDERACY, in *Law*, is when two or more perſons combine to do any damage to another, or to commit any unlawful act.

Confederacy is puniſhable, though nothing be put in execution: but then it muſt have theſe four incidents; 1. That it be declared by ſome matter of proſecution; as by making of bonds or promiſes to one another: 2. That it be malicious; as for unjuſt revenge: 3. That it be falſe; *i. e.* againſt the innocent: and, laſtly, That it be out of court, voluntarily. See CONSPIRACY.

CONFEDERATE TROOPS, troops of different nations united together in one common cauſe againſt an enemy.

CONFEDERATION OF THE RHINE, in French *la Ligue du Rhin*, is the act by which ſeveral German ſtates, ſituated between the Rhine and the Mayne, ſeparated themſelves from the Germanic body, and aſſociated as confederated ſtates of the Rhine, under the protection of the French empire. The inſtrument of this confederation was ſigned at Paris, on the 12th of July 1806, and the ratifications were exchanged at Munich on the 25th of the ſame month. The contracting parties were the emperor of the French, on the one part, and on the other, the kings of Bavaria and Wi[illegible]berg, the archbiſhop of Ratiſbon as prince primate, the grand dukes of Baden, Berg, Heſſe Darmſtadt, Naſſau Weilbourg, and Naſſau Uſingen, the prince [illegible]lern-Hechingen, and Seigmaringen, Salm Salm, Salm Kyrburg, Iſenburg Birſtein and Lichtenſtein, the duke of A[illegible]remberg, and the prince of Leyn. They declar[illegible] would admit other German princes and ſtates i[illegible] where their union with the confederation might [illegible] conſiſtent with the general intereſt, and thus virtually annihilated the inconſiderable part that was left of the German empire. This induced Francis II. laſt emperor of Germany, and firſt of Auſtria, formally to abdicate the German empire, by his proclamation of the 6th of Auguſt 1806. It was then expected that a ſimilar confederation would be formed on the north of the Mayne under the protection of either Pruſſia or Ruſſia: but the king of Pruſſia having declared war againſt France, in October 1806, and having been completely overthrown at the battle of Jena, on the 14th of the ſame month, ſeveral other German ſtates haſtened to join the confederation of the Rhine, as Lippe Detmold, Schaumburg Buckeburg, Saxe Weimar, Saxe Gotha, Saxe Cobourg, and the newly created kingdom of Saxony. By the peace of Tilſit, which erects the Pruſſian provinces on the right bank of the Elbe, and the poſſeſſions of Heſſe Caſſel, Orange Fulda, and other petty German ſtates into a new kingdom, to be called the kingdom of Weſtphalia, the confederation of the Rhine is extended to the banks of the Elbe, and will probably receive conſiderable modifications from ſuch a large and important acceſſion of new members. Its original ſtipulations were that the confederated ſtates,

Art. I. are for ever ſeparated from the Germanic body, and united by a particular confederation, under the deſignation of the "Confederated States of the Rhine."

II. Renounce the laws; and

III. The titles of the empire.

IV. The elector arch-chancellor takes the title of prince primate and moſt eminent highneſs, which title ſhall convey no prerogative derogatory to the entire ſovereignty which every one of the contracting parties ſhall enjoy.

V. The elector of Baden, duke of Berg, and landgrave of Heſſe Darmſtadt, take the title of grand dukes; the chief of the houſe of Naſſau that of duke; and the count of Leyn that of prince.

VI. The affairs of the confederation ſhall be diſcuſſed in a congreſs at Frankfort on the Mayne; divided into two colleges, that of the kings and that of the princes.

VII. The members of the league muſt be independent of every foreign power. They cannot enter into any other ſervice but that of the ſtates of the confederation and its allies. Thoſe who have been in the ſervice of a foreign power, and chooſe to continue in the ſame, muſt abdicate their principality in favour of one of their children.

VIII. Should any prince be diſpoſed to alienate the whole or any part of his ſovereignty, he can only do it in favour of a confederate.

IX. All diſputes are ſettled in the aſſembly at Frankfort, where

X. The prince primate preſides. But if the two colleges deliberate ſeparately, he preſides in the college of kings, and the duke of Naſſau in the college of princes.

XI. The fundamental ſtatute is to be framed by the prince primate.

XII. The French emperor is protector of the confederation, and names the ſucceſſor of the prince primate.

XIII. to XXI. Enumerate the ceſſions made by members of the league: thus, Naſſau cedes to Berg the town of Denſs and its territory; Bavaria acquires the imperial city of Nuremberg and its territory: and

XXII. The prince primate receives Frankfort on the Mayne, and its territory, as his property.

XXIII. and XXIV. Enumerate the lordſhips over which the members of the confederation exerciſe the rights of ſovereignty.

XXV. They alſo enjoy the ſovereignty over the imperial knightdoms included within their boundaries.

XXVI. The rights of ſovereignty conſiſt in legiſlation, adminiſtration of juſtice, military conſcription or recruiting, and levying taxes.

XXVII. Regulates the patrimonial or private property of the ſubordinate princes and counts. Their domains cannot be ſold or given to any prince out of the confederation, without being firſt offered to the prince under whoſe ſovereignty they are ſituated.

XXVIII. Theſe ſubordinate princes and counts preſerve the privilege of being tried by their peers. Their fortune cannot be confiſcated, but their revenues may be ſequeſtrated during the life-time of the criminal.

XXIX. and XXX. Regulate the payment of debts.

XXXI. The ſubordinate princes or counts may take up their reſidence where they chooſe, and draw their rents or capitals without any reſerve.

XXXII. Public functionaries not retained by the new ſovereign, receive a penſion proportionate to the ſituation they held.

XXXIII. The ſame takes place with reſpect to religious orders loſing their income.

XXXIV. The confederates renounce all reciprocal claims, except the eventual right of ſucceſſion.

XXXV. Between the French emperor and the confederated ſtates there ſhall be federatively and individually an alliance, by virtue of which every continental war in which either is engaged ſhall be common to all.

XXXVI. In the event of any power making preparations for war, the contracting parties, in order to prevent ſurpriſe, ſhall, upon the requiſition of the miniſter of one of them at the aſſembly of the league, arm likewiſe. And as the contingent of the allies is ſubdivided into four parts, the aſſembly ſhall decide how many are to be called into activity. The armament, however, ſhall only take place upon the ſummons of the French emperor to each of the confederates.

XXXVII. The king of Bavaria binds himſelf to fortify Augſburgh and Lindau, and to form and maintain artillery and baking eſtabliſhments in the ſaid places.

XXXVIII. The contingent of each confederate is: France 200,000 men, Bavaria 30,000, Wirtemberg 12,000, Baden 8000, Berg 5000, Darmſtadt 4000, Naſſau, Hohenzollern; and others 4000.

XXXIX. Admits of the acceſſion of other German princes; and,

XL., as the concluding article, ſtipulates the exchange of the ratifications.

Of the two principal articles of the new conſtitution of the confederation of the Rhine, one relates to the eſtabliſhment of a ſuperior court of appeal, in which all cauſes between the ſovereigns and their ſubjects ſhall be finally decided. The other ſtipulates that the manufactures of each ſtate ſhall be allowed to be freely imported into all the other ſtates of the confederacy. Several new roads are to be made in order to facilitate commerce.

CONFERENCE, in its firſt and primary ſenſe, denotes mutual diſcourſe, and more eſpecially ſuch diſcourſe on ſerious and important ſubjects. It alſo denotes an appointed meeting for diſcuſſing ſome point, by perſonal debate; of this kind was that held at Ratiſbon, in 1601, at the joint deſire of Maximilian, duke of Bavaria, and Philip Lewis, elector Palatine, between ſome eminent Lutheran doctors on one ſide, and three celebrated Jeſuits on the other. The diſpute turned upon the two great points, to which almoſt all the conteſts between the Proteſtants and the Roman Catholics are reducible, *viz.* the rule of faith and the judge of controverſies. In 1615, another conference was held at Newberg between James Heilbronner, a learned Lutheran, and James Keller, a celebrated Jeſuit, by the appointment of Wolfgang William, prince Palatine, who had a little before that time embraced the Romiſh faith. But the moſt famous of all theſe conferences was that held in the year 1645 at Thorn, by the expreſs order of Uladiſlaus IV. king of Poland, between ſeveral eminent doctors of the Romiſh, Lutheran, and reformed churches. As this meeting was intended to heal the diviſions that prevailed among theſe churches, and to diſcover ſome method for healing their differences, and for effecting their reunion, it was on this account called the "Charitable conference." But the iſſue of this conference was very far from being favourable to the projected union. Some time after this, Erneſt, landgrave of Heſſe, in order to give a plauſible colour to his apoſtacy from the Proteſtant religion, and make it appear to be the reſult of examination and conviction, obliged Valerianus Magnus, a learned capuchin, to enter the liſts with Peter Habercorn, a reformed miniſter, in the caſtle of Rheinfield. Beſides theſe public conferences on the continent, there were others of a more private nature held, during the 17th century, between the doctors of the contending churches. The moſt remarkable of theſe was the famous diſpute between John Claude, the moſt learned of the Reformed divines in France, and Jaques Benigne de Boſſuet, whoſe genius and erudition placed him at the head of the Romiſh doctors in that country. This diſpute, held in the year 1683, terminated, like all the reſt, in widening the breach inſtead of healing it. Neither of the contending parties could be perſuaded to yield; but, on the contrary, they both returned from the field of controverſy more rivetted in their own opinions, and more averſe from thoſe of their adverſaries. Another conference was held at Leipſic, in 1631, between three Saxon doctors on the one ſide, and ſome of the moſt eminent divines of Heſſe-Caſſel and Brandenburgh on the other, with a view of repreſenting, with fidelity and preciſion, their reſpective doctrines, and for the purpoſe of diſcovering the obſtacles which prevented the union of the Lutheran and Reformed churches. The conference, however, though amicably conducted, broke up without having contributed in any reſpect to promote the ſalutary work of peace. The conference held at Caſſel in 1661, by the order of William VI., landgrave of Heſſe, between two profeſſors at Rintelen, on the ſide of the Lutherans, and two others of the univerſity of Marpurg on that of the Reformed, was attended with much greater ſucceſs than that of Thorn above mentioned: for, though it did not bring about a perfect uniformity of opinion, it produced an effect, which was in reality, much better, a ſpirit of Chriſtian charity and forbearance.

The moſt famous conferences of a ſimilar kind, held in England, were thoſe of *Hampton-Court* in 1604, and of the *Savoy* in 1661. The former was held by order of James I., on pretence of finding expedients, which might terminate the religious diſputes between the church and the puritans, and reconcile both parties. The profeſſed deſign of this conference was to examine the objections of the puritans againſt the doctrine, government, and diſcipline of the eſtabliſhed church, and to rectify its abuſes. But the progreſs and reſult of it evidently ſhew, that it was the deſign of the king to make an oſtentatious diſplay of his learning, and to mortify the puritans, who had favourable expectations from James's education in Scotland, and his profeſſed attachment to the church eſtabliſhed in that country, but who found, in the event, that he had conceived invincible prejudices againſt them. The diſputants on both ſides were nominated by the king. For the church, there were nine biſhops, and about as many dignitaries; and for the puritans, there were only four miniſters. This conference continued three days, *viz.* Jan. 14th, 16th, and 18th. The firſt day's conference was with the biſhops and deans; the puritan miniſters not being preſent; when the king made a ſpeech in commendation of the hierarchy of the church of England, congratulated himſelf, that he was now come into the "promiſed land," &c. &c.; and informed them, that the reaſon of his conſulting them by *themſelves* was to receive ſatisfaction from them: 1. About ſome things in the Common Prayer. 2. Concerning excommunication in the eccleſiaſtical courts. 3. About providing ſome well-qualified miniſters for Ireland; that if any thing ſhould be found meet to be redreſſed, it might be done without their being confronted by their opponents. After ſome alterations of no great importance, agreed on between the king and the biſhops, with regard to the confirmation of children, the abſolution of the church, private baptiſm, and baptiſm by women, and excommunication for leſſer crimes, his majeſty's ſcruples were ſatisfied; and thus ended the firſt day's conference. On the ſecond day, Jan. 16th, the four miniſters on the ſide of the puritans, together with Patrick Galloway, miniſter of Perth in Scotland, and two biſhops and ſix or eight deans on the other ſide, were convened. The king, ſeated in his chair, with his nobles and privy counſellors around him, informed the puritanical miniſters that he was ready to hear their objections againſt the eſtabliſhment. Upon which Dr. Raynolds, one of their number, in the name of his brethren, humbly requeſted: 1. That the doctrine of the church might be preſerved pure, according to God's word. 2. That good paſtors might be planted in all churches, to preach in the ſame. 3. That the book of Common Prayer might be fitted to more increaſe of piety. 4. That church government might be ſincerely miniſtered according to God's word. In the diſcuſſion of theſe points, Bancroft and the king took an active part. At the cloſe of this day's debate, his majeſty highly incenſed at the complaints ſtated by Dr. Raynolds, told the miniſters, that he found they were aiming at a Scots preſbytery; "which, ſays he, agrees with monarchy as well as God and the devil; there Jack and Tom and Will and Dick ſhall meet and cenſure me and my council. Therefore I reiterate my former ſpeech: "Le Roi s'aviſera." Stay, I pray, for one ſeven years before you demand; and then, if you find me grow purſie and fat, I may perchance hearken unto you. For that government will keep me in breath, and give me work enough. I remember how they uſed the poor lady, my mother, in Scotland, and me in my minority." Then turning to the biſhops, he put his hand to his hat and ſaid "my lords, I may thank you that theſe puritans plead for my ſupremacy; for if once you are out and they in place, I know what would become of my ſupremacy, for *no biſhop, no king*." When Dr. Raynolds ſaid he had nothing more to offer, the king ſaid, "if this be all your party have to ſay, I will make them conform, or I will hurry them out of this land, or elſe worſe." On the termination of this day's conference, ſome aſſerted that the puritans had been groſsly inſulted and ridiculed, and that they had not been allowed freedom of ſpeech; but the biſhops and courtiers flattered the king's wiſdom and learning, and called him the Solomon of the age. Bancroft fell upon his knees, and ſaid, "I proteſt my heart melteth for joy, that Almighty God of his ſingular mercy, has given us ſuch a king, as ſince Chriſt's time has not been." Chancellor Egerton ſaid, "he had never ſeen the king and prieſt ſo fully united in one perſon." The king was no leſs ſatisfied with his own conduct, and boaſted of his victory over the puritans. At the third day's conference, Jan. 18, the biſhops and deans were firſt called into the privy-chamber with the civilians, to ſatisfy the king about the high commiſſion and the oath ex officio; and when the king expreſſed his ſatisfaction with the latter, the old archbiſhop (Whitgift) was ſo tranſported as to exclaim, "undoubtedly your majeſty ſpeaks of the ſpecial aſſiſtance of God's ſpirit." A committee of biſhops and privy-counſellors was then appointed to conſider of leſſening the charges in the high commiſſion, for planting ſchools and proper miniſters in the kingdom of Ireland, and on the union of England and Scotland. After which Dr. Raynolds and his brethren were called in, not to diſpute, but only to hear the few alterations or explanations in the Common Prayer Book, that had been adopted; but when they expreſſed their wiſh that ſomething further might be done, or at leaſt that the ſurplice and croſs might not be urged, the king replied with a ſtern countenance, interrupting the biſhops who were about to anſwer, "We have taken pains here to conclude in a reſolution for uniformity, and you will undo all by preferring the credit of a few private men to the peace of the church; this is the Scots way; but I will have none of this arguing; therefore let them conform, and that quickly too, or they ſhall hear of it; the biſhops will give them ſome time, but if any are of an obſtinate and turbulent ſpirit, I will have them enforced to conformity." Thus ended this conference, and the opportunity for conciliation and union was loſt; and this was chiefly owing to the king's pedantry and love of adulation, to his high and arbitrary principles, and to his inveterate hatred of the Puritans.

The *Savoy* conference was held in purſuance of the declaration of Charles II. Oct. 25, 1660, concerning eccleſiaſtical affairs, when 12 biſhops and nine aſſiſtants were appointed on the part of the epiſcopal church of England, and as many miniſters on the ſide of the preſbyterians, to aſſemble at the biſhop of London's lodgings at the Savoy; "to review the book of Common Prayer, comparing it with the moſt ancient and pureſt liturgies; and to take into their ſerious and grave conſideration the ſeveral directions and rules, forms of prayer, and things in the ſaid book of Common-Prayer contained; and to adviſe and conſult upon the ſame, and the ſeveral objections and exceptions which ſhall be now raiſed againſt the ſame; and if occaſion be, to make ſuch reaſonable and neceſſary alterations, corrections, and amendments, as ſhall be agreed upon to be needful and expedient, for giving ſatiſfaction to tender conſciences, and the reſtoring and continuance of peace and unity in the churches under his majeſty's government and direction."

They were to continue four months from the 25th of March 1661, and then preſent the reſult of their conferences to his majeſty under their ſeveral hands. When the conference opened on the 15th of April, ſome difficulties occurred about the proper mode of proceeding; ſome of the preſbyterian party were for inſiſting only on a few matters of importance, judging that if theſe were gained, and an union followed, it might be more eaſy to obtain the others afterwards. But the majority, by the influence of Mr. Baxter, were for extending their deſires to the utmoſt, and thought themſelves bound by the words of the commiſſion, to offer every thing which they thought might conduce to the peace of the church; but when they were put in mind, that the king's commiſſion gave them no power to alter the government of the church, nor to inſiſt upon archbiſhop Uſher's model, nor ſo much as to claim the conceſſion of his majeſty's late declaration, they were much diſcouraged; for they were now convinced that all they were to expect were a few amendments in the liturgy and Common-Prayer Book. They wiſhed alſo to have conſulted their abſent brethren, and to have received from them a commiſſion in form; but this was denied. Inſtead of drawing up a few ſupplemental forms and making ſome amendments to the old liturgy, Mr. Baxter compoſed a new one, in the language of ſcripture, which he called “The Reformed Liturgy;” not with a deſign entirely to ſet aſide the old one, but to give men liberty to uſe either according to their own choice and approbation. This was preſented to the biſhops in the conference, together with exceptions to the “old liturgy.” This gave great offence, partly becauſe a liturgy, compoſed by a ſingle perſon in fourteen days, was ſet in competition with one which had been received in the church for a whole century; and partly, becauſe it was inconſiſtent with the commiſſion, and the biſhops' declaration of varying no further from the old ſtandard than ſhould appear to be neceſſary; and, therefore, the reformed liturgy was rejected at once without examination. When the preſbyterians preſented their exceptions to the liturgy, they accompanied them with “a petition for peace,” beſeeching the biſhops to yield to their amendments; to free them from the ſubſcriptions and oaths in his majeſty's late declaration, and not to inſiſt upon the re-ordination of thoſe who had been ordained without a dioceſan biſhop, nor upon the ſurplice, the croſs in baptiſm, and other indifferent ceremonies, enforcing their petition by various arguments and motives. Theſe exceptions were canvaſſed, and produced a variety of alternate objections and replies. The biſhops, however, would make no conceſſion to the prejudices of the preſbyterians; upon which they ſent them a large expoſtulatory letter, in which, after having repeated their objections, they lay the wounds of the church at their door. The term for the treaty being almoſt ſpun out in a paper controverſy, about 10 days before the commiſſion expired, a diſputation was agreed on, to argue the neceſſity of alterations in the preſent liturgy. Three of each party were choſen to manage the argument. The diſpute, however, terminated without effect. From arguments the preſbyterian miniſters deſcended to intreaties, and beſought the biſhops to compaſſionate ſcrupulous minds, and not to deſpiſe their weaker brethren; to all which the biſhops replied, that they were only commiſſioned to make ſuch alterations in the liturgy as ſhould be neceſſary, and ſuch as ſhould be agreed upon. Mr. Baxter ſays, that the biſhops would not abate the ſmalleſt ceremony, nor correct the groſſeſt error, for the peace of the church. Thus the king's commiſſion expired July 25, and the conferences ended without any proſpect of accommodation. It was agreed at the concluſion, that each party might repreſent to his majeſty, that they were all agreed upon the ends of the conference, which were the welfare, unity, and peace of the church, but ſtill diſagreed as to the means of procuring them. The biſhops thought they had no occaſion to repreſent their caſe in writing, but the preſbyterian commiſſioners met by themſelves, and drew up an account of their proceedings, with a petition for that relief which they could not obtain from the biſhops. Hume's Hiſt. vol. vi. 10. 13., vol. vii. 369.

CONFERVA, in *Botany*, a name occurring in Pliny for a water plant, ſuppoſed to be C. rivularis of Linnæus, ſo called, he ſays, *a conferruminando*, becauſe it cloſely adheres together, Linn. gen. 1207. Schreb. 1672. Juſſ. 6. Vent. 2, 32. Claſs and order, *cryptogamia algæ*. Nat. Ord. *Algæ*. Linn. Juſſ. Vent.

Gen. Char. Fibres ſimple, uniform, capillary, filamentous.” Linn. “Filaments capillary, ſimple or branched, jointed; joints numerous, often unequal.” Lam. Vent. “Seeds produced within the ſubſtance of the capillary or jointed frond, or in cloſed tubercles united with it.” Dr. Smith.

Species. I. *Simple.*

* *Immerſed.*

+ *In ſalt water.*

1. C. *confervicola*. Conferva upon conferva. Dillw conf. 8. Dill. Muſc. 552. tab. 85. fig. 21. “Filaments ſimple, minute, ſomewhat crowded, acute; partitions obſcure; joints cylindrical, unequal in length.” Dillw. *Filaments* rarely more than an eighth of an inch long, of a dark glaucous colour, tapering. Common in the lateſt months of autumn on various fuci and confervæ. 2. C. *flacca*. Dillw. 49. “Filaments ſimple, very ſlender, minute, flaccid; partitions tranſparent; joints very ſhort.” Growing in looſe patches of a green colour, about half or three-fourths of an inch long. *Joints* ſcarcely half ſo long as broad. Paraſitical on confervæ, and the ſmaller fuci in the neighbourhood of Swanſea. 3. C. *fucicola*. Velley Mar. Plant. Pl. 4. Dillw. 66. Wither. 4. 136. “Filaments cluſtered, ſimple, obtuſe; partitions tranſparent, ſlightly contracted; joints rather long.” Dillw. *Filaments* very numerous, thickly cluſtered at the root, diverging while in the water, from four to ſix lines long, of a dirty yellow or brown colour, ſomewhat gloſſy when dried. *Joints* about twice as long as broad, filled with minute granules. Paraſitical on fucus veſiculoſus, and ſometimes on nodoſus. 4. C. *curta*. Dillw. 76. “Filaments cluſtered, ſimple, ſomewhat cartilaginous or horny, erect, ſhort, attenuated at both ends; partitions tranſparent, ſlightly contracted; joints rather ſhort.” *Filaments* ſeldom more than three or four lines long, of an olive-brown colour, obtuſe, growing in roundiſh ſtiff tufts. *Joints* not much longer than thick. Paraſitical on fuci. 5. C. *carnea*. Dillw. 84. “Filaments ſimple, cluſtered, ſomewhat knotty, fleſh-coloured; joints rather ſhort, attenuated at both ends; juice collected into ſolitary globules.” *Filaments* from a quarter to half an inch long, rather obtuſe. *Partitions* dark-coloured. *Joints* ſometimes about twice the length of the diameter, ſometimes little more than the length; colourleſs, except where the juice is collected. Paraſitical in looſe tufts on other confervæ. 6. C. *capillaris*. Linn. Sp. Pl. 14. Lam. 14. Dill. p. 25 tab. 5. fig. 25. A. Dillw. 9. (C. linum; Flor. Dan. 771. C. paluſtris, ſive filum marinum Anglicum. Rai. Syn. p. 60. n. 16.) “Filaments ſimple, cylindrical, rather rigid, curled, entangled, brittle; partitions tranſparent; joints cylindrical, ſhort; capſules ſeſſile.” *Filaments* three or four feet long, about the thickneſs of large thread, pale yellowiſh green, entangled, but never adhering together; perfectly flaccid after it has been expoſed a few minutes to

the air. *Partitions* quite tranſparent, with a thin blackiſh line on each ſide. *Joints*, when dry, generally appearing alternately compreſſed. Found in the ditches and ſtagnant pools of ſalt marſhes. 7. C. *tortuoſa.* Dillw. 46. "Filaments ſimple, rather rigid, entangled, ſlender; partitions tranſparent; joints cylindrical, rather long." Reſembling the preceding ſpecies in miniature. *Filaments* as fine as human hair, leſs brittle than thoſe of C. capillaris; joints nearly twice as long as broad. Found in ſalt-pools, and on rocks in the ſea. 8. C. *ærea.* Dillw. 80. "Filaments ſimple, rather rigid, nearly ſtraight; partitions glaſſy-tranſparent, contracted; joints oblong, ſhort." *Filaments* ſeveral from the ſame root, from ſix to fifteen inches long, ſometimes nearly the thickneſs of a crow quill, generally about that of large thread, dark or blueiſh green, brittle. *Joints* not ſo long as broad, rounded at each end. On ſtones in the ſea.

†† *In freſh water.*

9. C. *ſordida.* Dillw. 60. "Filaments ſimple, ſlender; partitions ring-like; joints rather long, tranſparent." *Filaments* very long, extremely ſlender, entangled. *Joints* about four times as long as thick. In ponds, pools, and ditches frequent. In ponds forming a ſemi-tranſparent cloud-like maſs round the graſs or reed on which it grows, of a yellowiſh-green colour. In ſmall currents, floating, in denſer maſſes, on the ſurface. 10. C. *inflata.* Smith Eng. Bot. 1670. Conjugata inflata; Vaucher conf. 68. tab. 5. fig. 8. "Filaments ſimple; joints three times as long as broad; when fertile, ſwelling and elliptical." *Filaments* but the 700th part of an inch in diameter, tranſparent, almoſt colourleſs. *Joints* at firſt exactly cylindrical, marked with green colouring matter in ſpiral lines; afterwards ſwelling, elliptical, each protruding a lateral tube, ſo as to unite with ſimilar tubes of a neighbouring plant. The colouring matter of one joint paſſes into the other, its ſpiral appearance being entirely loſt. At length each joint which has received it ſwells ſtill more, growing quite elliptical, and filled with a ſolid green body, which M. Vaucher has proved to be a ſingle ſeed, producing in due time a ſolitary young plant. Theſe appearances cannot be perceived without the aid of a microſcope. Found by Mr. W. Boner at Henfield in Suſſex. 11. C. *punctalis.* Dillw. 51. "Filaments ſimple, ſlippery, very ſlender; partitions obſcure; joints rather ſhort, cylindrical; juice finally collected into ſolitary globules." *Filaments* from one to two inches long, ſo ſlender, as, when ſingle, ſcarcely to be diſtinguiſhed by the naked eye. In ditches and pools not unfrequent. 12. C. *bipunctata.* Dillw. 2. Smith Eng. Bot. 1610. Roth Cat. Bot. ii. p. 204. (C. ſtellina; Muller in Nov. Act. Pet. iii.) "Filaments ſlippery, yellowiſh, joints ſhort, cylindrical, with two ſpots." *Joints* remarkable in having each two dark ſpots, frequently furniſhed with a green longitudinal ſtreak running through them; theſe ſpots ſometimes fill nearly the whole, ſometimes only a ſmall portion of the joint, and, when verging upon decay, aſſume a ſtellated appearance; but are not viſible without the aid of a microſcope. 13. C. *nitida.* Dillw. 4. Flor. Dan. tab. 819. (C. rivularis; Hudſ. Flor. Ang. 1. *β.* C. ſericea craſſior & varie extenſa. Dill. p. 13. tab. 2. fig. 2. C. decimina; Mull. nov. act. Pet. iii. C. ſetiformis; Roth. Cat. Bot. Faſc. 1. p. 171. 2. p. 103. Byſſus paluſtris confervoides, Mich. Gen. tab. 89. fig. 6.) "Filaments ſimple, ſhining, ſlippery; joints rather long, cylindrical; granules of the fructification doubly ſpiral." *Filaments* a foot or more long, about the thickneſs of a human hair, dark green, growing at the bottom of the water in looſe irregular patches, not ſufficiently matted as to contain air bubbles, nor ſo much entangled as in many others. 14. C. *ſpiralis.* Dillw. 3. Smith Eng. Bot. 1656. Roth Cat. Bot. ii. p. 202. (C. quinina; Mull. act. nov. Pet. iii.) "Filaments ſimple, ſlippery; joints cylindrical, rather long; granules of the fructification, ſimply ſpiral." *Filaments* longer and more ſlender than thoſe of nitida, anaſtomiſing like thoſe of C. inflata. 15. C. *jugalis.* Dillw. 5. Flor. Dan. tab. 883. (C. ſcalaris; Roth. Cat. Bot. ii. p. 196.) "Filaments ſimple, flaccid, often conjugate by pairs; granules of the fructification doubly ſpiral; finally collected into globules." In pools and ditches. Mr. Dillwyn ſtrongly ſuſpects, that C. nitida (n. 13.), is only the preſent plant in an earlier period of its growth. 16. C. *genuflexa.* Dillw. 6. Roth. Cat. Bot. ii. p. 199. (C. ſerpentina; Mull. nov. act. Pet. iii.) "Filaments ſimple, very ſlender, brittle, here and there knee-bent and conjugate; joints rather long, cylindrical; granules collected into lines." Filaments as far as can be judged, conſidering their brittleneſs, not more than one or two inches long, anaſtomiſing occaſionally at very uncertain diſtances, and only where they are geniculate, not regularly paired as in C. jugalis, but connecting themſelves with any other that is near them, and manifeſting a ſtrong affinity to the next ſpecies. In pools and ditches. 17. C. *reticulata.* Linn. Sp. Pl. 11. Lam. 11. Smith Eng. Bot. 1687. Dill. p. 20. tab. 4. fig. 14. (Hydrodictyum; Vaucher Conf. 88. tab 9.) "Filaments united into the form of a tubular net." *Filaments* green, tubular, forming a very delicate net, open at both ends; meſhes generally with five ſides, ſometimes with four or ſix. M. Vaucher found the old plants in a ſtationary condition during winter; but in ſpring the joints ſwelled, and gave out ſimple cylindrical maſſes of green matter. Each maſs ſoon became a reticulated tube, which in two or three months grew to the full ſize of the parent plant. It grows looſely, floating in ſtill water: but not very common. 18. C. *rivularis.* Linn. Sp. Pl. 1. Lam. 1. Dillw. 39. Smith Eng. Bot. 1654. (C. compacta; Roth. Cat. Bot. i. p. 170. C. fluviatilis ſericea, vulgaris & fluitans; Dill. p. 12. tab. 2. fig. 1. C. Plinii Rai. Syn. p. 58.) "Filaments ſimple, dark green, ſlender, very long, very denſely compact, frequently twiſted; joints rather ſhort." Filaments often two or three feet long. 19. C. *lucens.* Dillw. 47. Smith Eng. Bot. 1655. "Filaments ſimple, ſlender, glaucous, ſlippery; joints ſhortiſh; granules collected in faſciæ." Filaments ſeldom more than three inches long, tapering. On rocks and ſtones in clear rapid rivulets. 20 C. *diſſiliens.* Dillw. 63. "Filaments ſimple, ſtraight, brittle; partitions but little contracted, often looſe; joints ſhort, with a dark ſpot in the middle." Filaments from three to ſix inches long, leſs than a human hair in diameter, dark green, often breaking at the partitions and remaining connected at one extremity; joints about half as long as thick. In ditches on reeds and other aquatic vegetables. 21. C. *pectinalis.* Dillw. 24. Smith, Eng. Bot. 1611. Mull. nov. act. Pet. iii. (C. bronchialis; Roth. Cat. Bot. i. p. 186.) "Filaments ſimple, tranſparent, broken, acuminate; partitions often looſe; joints very ſhort, cryſtalline-tranſparent in the middle." *Filaments* ſeldom half an inch long, dirty green, to the naked eye reſembling decayed vegetable matter, when entire gradually tapering to a point, and bearing ſome reſemblance to the antennæ of a lobſter, frequently breaking at the partitions, and remaining connected at one extremity. *Joints* appearing coloured at each end by a green fluid, which, as the plant approaches to decay, collapſes, ſometimes forming into ſmall globular maſſes, and ſometimes diſappearing entirely. In rivers and ſtagnant waters, adhering to decaying wood and vegetables. 22. C. *flocculoſa.* Dillw. 28. Roth. Cat. Bot. p. 192. tab. 4. fig. 4. and tab. 5. fig. 6. "Filaments moſt commonly ſimple, minute; partitions looſe; joints priſmatic, alternately refracted." *Filaments* ſeldom more than a quarter of an inch long,

varying from a pale to a greeniſh brown. *Joints* with a double line running through the middle, and frequently with ſome tranſverſal bands; as they adhere to each other only in a ſingle point, and always at alternate ends, they give the plant the appearance of a ſtring of parallelograms, united at the corners. It might be taken for a much broken piece of C. pectinalis, but the joints cannot be ſo diſpoſed as to form one regular line. In pools and ſlow ſtreams, adhering to decaying vegetables and to other confervæ. eſpecially to C. glomerata. 23. C. *fontinalis*. Linn. Sp. Pl. 2. Lam. 2. Flor. Dan. tab. 651. fig. 2. Dillw. 64. (C. minima byſſi facie; Dill. p. 14. tab. 12. fig. 3.) “Filaments ſimple, cylindrical, truncate, dark green, faſciated; partitions obſcure; joints very ſhorts.” *Filaments* without any apparent root, equally obtuſe at both ends. Common in rivers, pools, and ditches, generally floating in irregular maſſes on the ſurface. 24. C. *limoſa*. Dillw. 20. (C. gelatinoſa, omnium tenerrima et minima aquarum limo innaſcens; Dill. p. 15.) “Filaments ſimple, very ſlender, ſhort, mucous, denſely compact, blueiſh green, ſlippery; partitions indiſtinct.” Common on the muddy edges of rivers, ditches, and ponds, repreſenting to the naked eye, except at the margin, where it is fibrous, a widely expanded, thin, ſhapeleſs gelatinous maſs, ſometimes floating at the top of the water. In either caſe the only mode to examine it, is to carry it home, without allowing it to dry, and to put it in a pan of water, where, in the ſpace of a night, it will ſhoot out an immenſe number of threads, viſible to the naked eye only from their number; theſe viewed through a microſcope appear obtuſe at each end, and croſſing each other without any regular order. Mr. Dillwyn is inclined to think that this is only the laſt ſpecies in a younger ſtate; the principal difference is in the ſize and colour; in C. fontinalis the filaments are much larger, browner, and not gloſſy; the joints alſo are far more diſtinct, and more regularly diſpoſed. 25. C. *violacea*. Hudſ. Flor. Ang. p. 592. (C. confragoſa; Lightf. Flor. Scot. p. 976. Dill. p. 15. tab. 2. fig. 4.) “Filaments ſimple, equal, violet.” *Filaments* about half an inch long, of a beautiful violet or indigo colour, of a ſlippery mucous ſubſtance, ſo extremely fine as to be undiſtinguiſhable by the naked eye, and ſo crowded together as to form, when moiſt, a gelatinous maſs, and when dry, a membranous lamina. Found by Lightfoot on the rocks in the waterfalls of the mountain of Goatfield in the Iſle of Arran, and ſaid by Dillenius to grow in Alpine rivulets near Llanberis. 26. C. *echinulata*. Smith Eng. Bot. 1378. “Glaucous, ſtems ſimple, ſpreading every way from a centre, and forming a globe.” Sent by the Rev. Mr. Davies from a lake in Angleſea. It covers the ſurface of the water in the months of June and July, and conſiſts of innumerable minute globules of a glaucous or verdigreaſe green, all nearly of a ſize. When examined with a microſcope each globule appears to be compoſed of a number of ſimple cylindrical ſhort filaments apparently ſpringing from a ſolid centre. Under a very high magnifier theſe filaments are found to be formed of ſhort uniform joints, each of which is of an equal thickneſs throughout, but the upper ones gradually diminiſh in ſize. Mr. Dawſon Turner ſuggeſts that this minute vegetable ought probably to be referred to Roth's new genus rivularia, to which ulva incraſſa and U. pruniformis of Engliſh botany belong. Thoſe ſpecies are of a pulpy ſubſtance, cloathed with jointed filaments.

** *Not immerſed.*

27. C. *ericetorum*. Dillw. 1. Smith Eng. Bot. 1553. Roth Cat. Bot. ii. p. 206. “Filaments ſimple, ſlender, proſtrate, denſely entangled; partitions ſcarcely contracted; joints about as long as they are broad.” *Filaments* from half an inch to an inch long, of a dull purple colour, covering the moiſt ſandy earth in large patches. Common on moiſt heaths. 28. C. *muralis*. Dillw. 6. Smith Eng. Bot. 1554. “Filaments ſimple, very ſlender, proſtrate, denſely entangled, ſomewhat rigid; joints very ſhort, ſlightly ſwelled; partitions obſolete.” *Filaments* about an inch long, ſcarcely diſcernible by the naked eye, covering the ſubſtances on which they grow with a fine cloſe green mat. Common upon damp walls, ſtones, and neglected ſhady walks. 29. C. *decorticans*. Dillw. 26. “Filaments ſimple, cloſely interwoven, glaucous; partitions obſcure; joints ſhort.” *Filaments* growing in large patches ſo intimately interwoven as to peel off in flakes, bearing a conſiderable reſemblance to a piece of ſilk or ribbon. It differs from C. muralis in its much greater tenacity and darker colour. Not unfrequent on damp walls and ſtones.

II. *Compound.*
* *Immerſed.*
† *In ſalt-water.*

30. C. *polymorpha*. Linn. Sp. Pl. 17. Dillw. 44. (C. marina geniculata nigra palmata; Dill. p. 32. tab. 6. fig. 35. Ceramium faſtigiatum. Roth Cat. Bot. ii. p. 175.) “Filaments dichotomous, faſtigiate, ſomewhat cartilaginous; joints ſhort; capſules on the upper branchlets, egg-ſhaped, ſeſſile.” *Filaments* about the thickneſs of horſe hair, repeatedly dichotomous, with rather acute angles, of a dark purple colour when young, afterwards becoming black. Common on the larger fuci, moſt commonly on F. nodoſus, in thick tufts, two or three inches long. 31. C. *lanuginoſa*. Dillw. 45. “Filaments nearly ſimple, very minute; of a ruſty colour; joints rather long, pellucid in the middle; capſules ſeſſile, unilateral.” In the ſea, adhering to other confervæ. 32. C. *nigra*. Hudſ. Flor. Ang. p. 595. “Filaments equal, branched, very long; branches alternate, many-cleft, very ſhort.” *Filaments* five inches long, black, ſtiffiſh; branches faſciculated. On the Yorkſhire coaſt. 33. C. *byſſoides*. Dillw. 58. Eng. Bot. 547. “Filaments more than twice pinnated; branches and branchlets alternate; uppermoſt ones extremely ſhort, ſomewhat faſciculate; partitions from the union of the veins; joints rather long; capſules egg-ſhaped, ſeſſile.” *Filaments* extremely flaccid, zig-zag, tranſparent, beautifully ſtriated by longitudinal veins, each of which arch over at or near the ſame place, and appear to form the partition. Common on moſt of our ſhores, from three to five inches long, varying in colour from a reddiſh brown to a light or purpliſh red. 34. C. *paraſitica*. Hudſ. Flor. Ang. p. 604. Eng. Bot. 1429. “Filaments branched; branches doubly and alternately pinnated; capſules axillary, ſolitary, oblong.” *Filaments* an inch long or more, purpliſh, brown, ſlender, cylindrical, with the ſame jointed and tubular ſtructure as the preceding. Paraſitic on fuci, found rarely on the coaſt of Yorkſhire, Devonſhire, and Cornwal. Dr. Smith obſerves that the laſt two ſpecies have the jointed ſtructure of conferva, but agree better with the character of fuci in their fructification. The ſame obſervation will apply to ſeveral of the following ſpecies. 35. C. *nigreſcens*. Hudſ. Fl. Ang. p. 602. Smith Eng. Bot. 1717. “Filaments much branched; branches alternate, elongated; ultimate ones ſhort, crowded, awl-ſhaped; joints rather broader than long, compound.” *Filaments* from four to ſix inches long, blackiſh. *Joints* a little contracted, conſiſting of a circular double ſeries of numerous parallel tubes, ſimilar to thoſe of C. byſſoides. Mr. Stackhouſe is ſaid to have found the fructification in ſmall lateral nodules on the coaſt of Scotland, Devonſhire, and Cornwal. 36. C. *fuſca*. Hudſ. 602.

"Filaments much branched; branches and branchlets alternate, ſimple." *Filaments* three or four inches long, dark brown or reddiſh; branches long; branchlets ſhort, diſtant. *Fructifications* terminal and lateral, ſeſſile, ſmall, roundiſh, cluſtered. 37. C. *mertenſii.* Smith Eng. Bot. 999. "Filaments much branched; branches oppoſite, pinnated; joints ſhort; capſules minute, acorn-ſhaped, on ſhort peduncles." In habit reſembling fucus wigii. *Filaments* about three inches long, pale yellow, pinnated from their very origin; pellucid; branches ſhort, diſtichous, horizontal, generally ſimple. *Partitions* darker, and thence viſible. *Capſules* viſible only with a good glaſs. Found on the beach near Yarmouth. Mr. Dawſon Turner. 38. C. *fucoides.* Hudſ. Fl. Ang. p. 603.—Dillw. 75. Eng. Bot. 1743. "Filaments capillary, ſomewhat cartilaginous, much branched; partitions from the union of the nerves; joints compound, ſhortiſh, ſtriated; capſules ſolitary, egg-ſhaped, ſeſſile." *Filaments* from two or three inches to a foot long, reddiſh-brown, becoming darker and almoſt black with age, remarkably thick and buſhy in its growth, ultimate branches awl-ſhaped, all alternate. *Joints* of the ſtem and principal branches three times as long as broad; of the branchlets about as long as broad, each conſiſting of a ſimple circular ſeries of numerous parallel tubes. *Capſules* terminal and lateral, ſmall, obtuſe, diſcharging their ſeeds at the ſummit. On rocks and ſtones in the ſea, frequent. 39. C. *atrorubeſcens.* Dillw. 70. "Filaments branched, ſtriated; branches elongated, generally alternate, branchlets ſhort. awl-ſhaped, faſciculated; capſules egg-ſhaped, peduncled." *Filaments* from four to nine inches long, the thickneſs of ſmall thread, growing ſeparately, varying from a light purple to a duſky red, and becoming black with age or by drying, ſtriated under the microſcope by longitudinal ſpiral veins, which arch over at or near the partitions, and at firſt ſight appear to form them. *Joints* in the principal branches often more than twice as long as broad, in the branchlets about equal in length and breadth. *Capſules* either lateral or terminal. In the ſea, adhering to rocks, ſtones, and ſhells. 40. C. *roſea.* Smith Eng. Bot. 966. Dillw. 17. (Ceramium roſeum. Roth Cat. Bot. ii. p. 182.) "Filaments repeatedly branched; branches and branchlets alternate, approximate; partitions tranſparent, a little contracted; joints oblong; capſules unilateral, ſeſſile, ſomewhat globular." *Filaments* from an inch and a half to three inches long, in their thickeſt parts nearly as fine as human hair, ſo fine near their tips as to be ſcarcely viſible, very flaccid, when floating in water reſembling beautiful feathers, roſe-coloured. In the ſea, on rocks, fuci, and other ſubſtances. 41. C. *coccinea.* Hudſ. Flor. Ang. p. 603. Eng. Bot. 1055. Dillw. 36. (C. plumoſa. Lightf. 996. Ellis Philoſ. Tranſ. vol. lvii. 425. tab. 18. fig. c. c. d. D. Ceramium hirſutum. Roth Cat. Bot. ii. 169. tab. 4.) "Filaments ſomewhat cartilaginous, much branched; main ſtem rough with hairs; branches alternate, more than twice alternately pinnated; extreme branchlets faſciculated, pencil-ſhaped; partitions obſcure; joints ſhort; capſules egg-ſhaped." *Main ſtem* nearly as thick as common twine, ſolitary, moſtly of a darker red than the branches. *Partitions* ſcarcely perceptible in the main ſtem and larger branches, but very apparent in the ſmaller ones, dividing them into ſhort tranſparent joints. *Capſules* bright red early in ſpring, becoming gradually darker, and in May diſcharging the ſeeds by an aperture at the tip. On rocks and ſtones in the ſea common. 42. C. *turneri.* Smith Eng. Bot. 1637. "Repeatedly branched, very ſlender, tufted; ultimate branches all pectinated on the upper ſide; joints tranſparent, cylindrical; capſules globular, ſeſſile between the teeth of the branches, unilateral." Pectinated *branchlets* oppoſite. *Capſules* deep red, ſcattering the ſeeds over the branches. *Seeds* large. In the ſea, off the Iſle of Wight. 43. C. *plumula.* Ellis Phil. Tranſ. vol. lvii. p. 426. Dillw. 50. "Filaments much branched; branches alternate, pinnated; pinnæ oppoſite; ultimate branchlets unilateral; joints longiſh; capſules ſhort, pedicelled." Whole plant deep red, pellucid. *Partitions* dark. *Capſules* very numerous, unilateral on the ultimate branchlets, diſcharging the ſeeds at the tip. In the ſea, adhering to confervæ. 44. C. *tetrica.* Dillw. 81. "Filaments repeatedly pinnated; pinnæ and pinnulæ alternate; ultimate ones curved; joints rather long; capſules generally only one on each ultimate branchlet, globular, peduncled." *Stems* ſeveral from the ſame callus, forming thick entangled tufts of a browniſh-red colour, ſix or eight inches long, about the thickneſs of horſe hairs. On rocks and fuci in the ſea. 45. C. *diaphana.* Lightf. Flor. Scot. 996. Hudſ. Flor. Ang. 653. Dillw. 38. Smith Eng. Bot. 1742. (C. noduloſa. Hudſ. Flor. Ang. 600. C. marina nodoſa lubrica, ramoſiſſima et eleganter rubens. Dill. 35. tab. 7. 40.) β C. purpuraſcens. Hudſ. "Filaments capillary, repeatedly forked, divaricated; ultimate diviſions like a pair of forceps; partitions obſolete; joints ſhort, pellucid in the middle, deep red at each end; capſules lateral, ſolitary, globular." From two to ſix inches high, preſenting to the naked eye the appearance of a ſeries of ſmall beads, alternately coloured and pellucid. Common in the ſea, on rocks, ſtones, and fuci. 46. C. *rubra.* Hudſ. Flor. Ang. 600. Smith Eng. Bot. 1166. Dillw. 34. (C. noduloſa. Lightf. Flor. Scot. 944. C. geniculata, ramoſiſſima lubrica longis ſparſiſve ramulis. Dill. 35. tab. 6. fig. 38. A. Ceramium virgatum. Roth Cat. Bot. i. 148. tab. 8. fig. 1.) "Filaments repeatedly branched, thread ſhaped, thickly jointed; ultimate branches briſtle-ſhaped, forked; capſules ſomewhat globular, ſeſſile, ſolitary, lateral." Eighteen or twenty inches high, light red or purple, very liable to bleach. *Filaments* one or more from the ſame callus, about the ſize of ſewing-ſilk; partitions dark red, more or leſs contracted; joints beautifully reticulated, pellucid towards the centre. Common on rocks and ſtones in the ſea. 47. C. *tetragona:* With. Bot. Arr. 34. 405. Dillw. 65. Eng. Bot. 1690. "Filaments much branched; branchlets faſciculated, ſhort, generally ſimple; joints ovate-cylindrical; capſules ſeſſile, ſomewhat globular." Seldom more than two inches long. *Stems* ſeveral from one callus, ſtraight, branched on all ſides, forming an irregular ovate general outline, of a light purpliſh-red colour; branches ſquare. Paraſitical on fungi. 48. C. *elongata.* Hudſ. Flor. Ang. 599. Dillw. 33. (Fucus diffuſus. Hudſ. Flor. Ang. 589.) "Filaments much branched, cartilaginous; branches and branchlets elongated, diffuſe, briſtle-ſhaped veined; partitions obſcure; joints very ſhort; capſules egg-ſhaped, ſeſſile." Exceeding in ſize every other Britiſh conferva. Main *ſtem* as thick as common twine, purpliſh-red; branchlets paler; partitions dark-coloured. *Capſules* ſcattered ſparingly on the ultimate branches. On rocks, oyſter-ſhells, &c. 49. C. *littoralis.* Linn. Sp. Pl. 6. Lam. 6. Dillw. 31. (C. marina capillacea longa, ramoſiſſima, mollis, Dill. 23. tab. 4. fig. 19.) "Filaments much branched, very ſlender, zig-zag, thickly matted; branches and branchlets acuminate; partitions obſcure; joints cylindrical, ſhort." *Filaments* from ſix to nine inches long, of a dull olive-green colour; branches generally alternate, making an acute angle with the ſtem. *Capſules* globular, ſcattered irregularly on the branches, rarely found. On rocks and fuci, common. 50. C. *comoides.* Dillw. 27. Smith Eng. Bot. 1700. "Filaments capillary, zig-zag, branched; branches ſcattered, ſharp-pointed, but little ſpreading; partitions ſcarcely viſible." Nearly allied to the preceding. *Filaments* ſeldom more than an inch long, purple-brown, lying one over another, on the round pebbles in the ſea, ſo as to have a ſtriking reſemblance to an infant's head. 51. C. *tomentoſa.* Hudſ. Flor. Ang. 594. Dillw. 56. (C. marina tomentoſa, minus tenera et ferruginea. Dill. 19. tab. 3. fig. 13.) " Filaments much branched, very ſlender, thickly matted, divaricated, extreme branchlets ſimple; joints long." *Filaments* from three to five inches long, of a pale greeniſh or ruſſet-brown colour; branches ſo ſlender as to be ſcarcely viſible without a microſcope, iſſuing at right angles. *Joints* at leaſt three times as long as thick. *Partitions* dark brown. Frequent, generally paraſitical on fucus veſiculoſus. 52. C. *albida.* Hudſ. Flor. Ang. 595. (C. marina tomentoſa, tenerior et albicans. Dill. 19. tab. 3. fig. 12. C. tomentoſa β. Roth.) " Filaments much branched, very ſlender, equal; branches ſimple, faſciculated, white." *Filaments* ſcarcely ſeparately viſible to the naked eye, pale green, ſoft, reſembling cotton. Found in ſalt water, ditches, and pools in the iſland of Selſey in Suſſex. 53. C. *ſetacea.* Hudſ. Flor. Ang. 599. Smith Eng. Bot. 1689. Dillw. 82. (C. marina gelatinoſa, corallinæ inſtar geniculata, tenuior. Dill. 33. tab. 6. fig. 37.) " Filaments alternately and repeatedly branched, taper-pointed, faſciculated, ſlippery; joints a little ſwelling, at leaſt four times as long as broad; lateral ſhoots bearing tufts of filaments containing many globular ſeeds. Seldom exceeding four or five inches in length, of a rich crimſon colour. On rocks and ſtones in the ſea, not unfrequent at the latter end of ſummer and beginning of autumn. 54. C. *borreri.* Smith Eng. Bot. 1741. " Filaments capillary, repeatedly branched; branches alternate, ſpreading in two directions, zig-zag; ultimate ones faſtigiate; joints cylindrical, about twice as long as broad." *Filaments* in tufts, about two inches long, of a delicate pink colour, turning orange when dry. *Fructification* unknown, but conjectured by Dr. Smith to reſemble that of C. ſetacea. Gathered on Yarmouth beach by W. Borrer, eſq. F. R. S. 55. C. *ſtricta.* Dillw. 40. " Filaments ſomewhat dichotomous, faſciculated, veined; joints long." *Filaments* in thick bundles, many from the ſame root, ſeldom more than three inches long, of a dull crimſon colour, repeatedly divided. *Joints* about three times as long as broad. On rocks in the ſea, at Dover and Swanſea. 56. C. *rothii.* Turton's Syſt. Nat. 6. 1806. Dillw. 73. Eng. Bot. 1702. (C. violacea. Roth. Cat. Bot. i. 190. tab. 4. fig. 1.) " Filaments erect, dichotomous, ſhort, denſely tufted, crimſon; branches alternate; joints very ſhort." *Filaments* very ſlender, from three to twelve lines long. *Joints* cylindrical, about twice as long as broad. On rocks by the ſea-ſhore. 57. C. *corallinoides.* Linn. Sp. Pl. 15. (C. marina gelatinoſa corallinæ inſtar geniculata craſſior. Dill. 33. tab. 6. fig. 36.) " Filaments dichotomous; joints thicker at the top." *Filaments* bright red or white, ſlippery, very tender, almoſt diſappearing when dry. On ſtones on the ſea-ſhore. 58. C. *tubuloſa.* Hudſ. Flor. Ang. 600. (C. marina fiſtuloſa. Dill. 34. tab. 6. fig. 39. Ulva confervoides. Linn.) " Filaments much branched; joints oval, alternately compreſſed." *Filaments* from two to four inches long, yellowiſh green; branches knotted, hollow. On rocks, ſtones, and fuci. 59. C. *catenata.* Linn. Sp. Pl. 16. Lam. 16. (C. ramoſa, geniculis longioribus cateniformibus. Dill. 27. tab. 5. fig. 27.) " Filaments branched, green; joints oblong, forming a kind of chain, with links alternately broader and narrower." On the coaſts of Carolina, the Bahama iſlands, and the ſouth of Europe. 60. C. *ſcoparia.* Linn. Sp. Pl. 9. Lam. 9. Smith Eng. Bot. 1552. Dillw. 52. (C. marina pennata. Dill. 24. tab. 4. fig. 23.) " Filaments much branched, rigid; branches faſciculated, ultimate diviſions alternate, acuminate; partitions obſcure; joints ſhort." Whole plant of a browniſh olive, changing when dry to a ruſſet-brown colour. *Filaments* from two to ſix or nine inches long; upper branches longer and more cluſtered than the lower, giving the plant a bruſh-like appearance. *Joints* about as long as thick. Frequent on the ſea coaſt on ſtones and pebbles. 61. C. *pennata.* Hudſ. Flor. Ang. 604.—Dillw. 86. " Filaments branched; upper branches pinnated; pinnulæ nearly oppoſite, nearly horizontal, approximate, ſtiff and ſtraight; partitions obſcure; joints ſhort; tubercles ſeſſile, ſpherical." Often confounded by botaniſts with the preceding. *Filaments* in buſhy tufts from half an inch to two inches long, olive green, brown when dry. On rocks, fuci, & corallines. 62. C. *verrucoſa.* Smith Eng. Bot. 1688. " Branches irregularly ſcattered and ſubdivided, ſcarcely jointed, ſtudded with rough warts." *Filaments* three or four inches long, pale reddiſh brown, capillary, but uneven, ſomewhat twiſted, not perceptibly jointed, except in the youngeſt ſhoots, where an interruption of colour is ſometimes perceived at intervals. Found on the coaſt of Hampſhire and Cornwal. 63. C. *villoſa.* Hudſ. Flor. Ang. 603.—Smith Flor. Ang. 546.—Dillw. 37. " Filaments branched; branches and branchlets oppoſite, diſtant; joints very ſhort: partitions obſcure, villous." *Stem* from ſix inches to three feet high, greeniſh yellow, ſeldom more than thrice divided; hairs in whorls on about every fourth or fifth joint, extremely ſlender, brittle; partitions not readily diſcoverable except in the verticillated hairs. On ſubmarine rocks and ſtones. 64. C. *ciliata.* Ellis in Philoſ. Tranſ. vol 57. p. 425. tab. 18 f. 4. H.—Dillw. 53. (C. piloſa; Roth Cat. Bot. 2. 225. tab. 5. fig. 2.) " Filaments dichotomous, incurved at the tips in a forceps-like manner; partitions beſet with verticillated ciliæ, reddiſh at each end, pellucid in the middle; capſules ſomewhat globular, lateral." Filaments in buſhy tufts, ſeldom more than two inches long, varying from a bright to a purpliſh red. On rocks, ſtones, and fuci, frequent. 65. C. *equiſetifolia.* Lightf. Flor. Scot. 984.—Smith Eng. Bot. 1479.—Dillw. 54. (C. imbricata; Hudſ. Flor. Ang. 603, and multifida. Hudſ. 603, as appears from an authentic ſpecimen communicated by Dr. Goodenough to Mr. D. Turner.) " Filaments much branched; branches acuminate, elongated; branchlets verticillated, ſhort, dichotomous; joints of the branchlets long." From three to eight inches long, the thickneſs of a crow's quill, bright red when young, afterwards dull brown. *Stem* and branches every where cloathed with numerous whorled branchlets, which, being longer than the joints, are tiled upon each other, and give the plant a rough ſpongy appearance. On rocks and ſtones in the ſea, not unfrequent. 66. C. *ſpongioſa.* Hudſ. 596.—Dillw. 42. (Fucus hirſutus; Linn. Mant. 134.—Muſcus marinus hirſutus; Moriſ. 3. 650. tab. 9. fig. 6.) " Filaments branched, branchlets very ſhort, ſimple, imbricated on all ſides; joints ſhort; capſules oblong, pedicelled." Seldom more than three inches long, olive-coloured. *Branchlets* not whorled but diſpoſed without any regular order, not dichotomous. *Capſules* ſmall, on rather long pedicels, diſcharging the ſeeds at the ſummit. Rocks in the ſea, not uncommon. 67. C. *verticillata.* Lightf. Flor. Scot. p. 984.—Smith Eng. Bot. 1718.—Dillw. 55. (C. Myriophyllum; Roth in Schraber's Journ 3. 335.) " Filaments cartilaginous, variouſly branched; branchlets at the partitions, verticillated, very ſhort, incurved, frequently forked; joints about as broad as long." Four or five inches long, of a dull olive colour. On rocks and ſtones in the ſea. 68. C. *arbuſcula.* " Primary filaments thick, not jointed, naked near the bottom, much branched above; branchlets crowded, ſomewhat verticillated,

lated, ſhort, branched, jointed ; joints cylindrical, ſhort." About three or four inches long, of a beautiful deep-red brown colour when freſh, dull brown when dry without gloſs. On ſubmerſed calcareous rocks in the north of Ireland. 69. C. *cancellata.* Linn. Sp. Pl. 10. Lam. 10.—Hudſ. Flor. Ang. p. 596.—Dill. 24. tab. 4. fig. 22. "Filaments branched ; branchlets ſhort, much divided, digitate." Three or four inches long, of a pale dirty colour, irregularly branched ; branches an inch and half or two inches long ; branchlets capillary, numerous, incurved, leaving a hollow ſpace between them and the branch. On ſtones and rocks in the ſea. 70. C. *repens.* Dillw. 18. Smith Eng. Bot. 1608. (C. fulva ; Hudſ. ?) "Filaments minute, creeping, denſely matted ; partitions ſcarcely contracted ; joints cylindrical, twice as long as they are broad." Seldom more than three or four lines long, the thickneſs of human hair, of a more or leſs vivid red colour, inveſting the larger fuci and confervæ in minute denſe tufts like velvet or pluſh ; branches and branchlets generally unilateral. 71. C. *flexuoſa.* Dillw. 10. "Filaments dichotomous, rather rigid ; branches zig-gag ; branchlets generally ſimple, very ſlender, alternately unilateral, ſpreading ; joints cylindrical ; partitions obſolete." *Filaments* in cloſely entangled maſſes, from four to eight inches long, finer than human hair, pale yellowiſh green in the branchlets, very dark green in the main ſhoots. On the ſea coaſt and in ſalt-water pools at Yarmouth. 72. C. *læte virens.* Dillw. 48. "Filaments much branched, rather rigid, curved ; branchlets twice alternately unilateral ; partitions pellucid ; joints long." *Filaments* from three to ſix inches long, light green, irregularly branched, growing in a buſhy manner. On rocks, fuci, and corallines on the Welſh coaſt. 73. C. *diffuſa.* Dillw. 21. Roth Cat. Bot. 2. 207. tab. 7. "Filaments branched, diffuſe ; branches ſomewhat dichotomous, zig-zag, remote ; branchlets ſhort, approximate, obtuſe ; partitions pellucid ; joints rather long." *Filaments* in looſely entangled bundles, from two to ſix inches long, pale green, more rigid than in moſt other ſpecies, not collapſing when drawn out of the water. On rocks in the ſea. 74. C. *rupeſtris.* Linn. Sp. Pl. 20. Lam. 20. Dillw. 23. Smith Eng. Bot. 1699. (C. glauca ; Roth Cat. Bot. 2. 208. tab. 6. C. trichodes ramoſior. Dill. 28. tab. 5. fig. 29.) "Filaments much branched, faſciculated, rigid, ſtraight, obtuſe ; joints long, even ; partitions but little contracted, colourleſs." From three to ſix inches long, dull green, in denſe tufts upon rocks, pebbles, or dead ſhells. 75. C. *pellucida.* Hudſ. p. 601. Smith Eng. Bot. 1716. "Filaments erect, much branched ; branches moſtly ternate, cylindrical ; joints even, cylindrical, four times as long as broad." Filaments about ſix inches long, green, ſhining, pellucid, ſomewhat wiry and elaſtic to the touch, naked and ſtem-like towards the bottom. On the coaſt about Yarmouth. 76. C. *fœniculacea.* Hudſ. p. 594. Dill. 16. tab. 2. fig. 8. "Filaments ſquare, much branched ; branches and branchlets very long, ſcattered." *Filaments* irregularly divided like the leaves of fennel, ſoft and greeniſh when young, browniſh and ſtiffer when old. On the ſhores of Cornwal and the Iſle of Man. 77. C. *æruginoſa.* Linn. Sp. Pl. 7. Lam. 7. (C. marina capillacea brevis, viridiſſima mollis ; Dill. 23. tab. 4. fig. 20.) "Filaments branched, ſoft, ſhorter than the human finger, very green." *Filaments* numerous, very fine, ſhining and ſilky when dry, retaining their elegant cærulean green colour. On fuci, not very common. 78. C. *vagabunda.* Linn. Sp. Pl. 18. Lam. 18. (C. marina trichoides, lanæ inſtar expanſa ; Dill. 30. tab. 5. fig. 32.) "Filaments zig zag, much branched ; branchlets very ſhort, horizontal." Floating in the water without root, pale green, joints ſo ſmall towards the extremities, as ſcarcely to be ſeen with a common lens. In ſalt water marſhes and ditches. 79. C. *ſericea.* Hudſ. p. 601. (C. trichodes virgata ſericea ; Dill. 31. tab. 4. fig. 33.) "Filaments much branched, elongated ; branchlets crowded, very ſlender." From four to eight inches long, pale green in ſalt water, fine green, ſofter and ſmoother in freſh water. On ſubmarine rocks ; alſo in the new river near London and other freſh water rivulets.

††*In freſh water.*

80. C. *dichotoma.* Linn. Sp. Pl. 8. Lam. 8. Smith Eng. Bot. 932. Dillw. 15. (C. dichotoma ſetis porcinis ſimilis ; Dill. 17. tab. 3. fig. 9. Ceramium dichotomum. Roth Cat. Bot. i. 153 ;) "Filaments faſciculated, ſtraight, faſtigiate, dichotomous, hollow, ſomewhat jointed ; partitions obſolete ; joints very long, capſules elliptical, ſeſſile." *Filaments* in denſe maſſes, about two feet long, conſiderably thicker than horſe-hair, dark green, moſt dichotomous near the top ; angles of the diviſions acute ; partitions ſcarcely perceptible, except in the dried plant. *Capſules* ſcattered, ſometimes ſingle, ſometimes five or ſix together. In ditches common ; alſo according to Dillenius in ditches, between Greenwich and Woolwich, filled every tide with the brackiſh water of the Thames. 81. C. *furcata.* Hudſ. Flor. Ang p. 592. (C. capillacea, filamentis bifidis et trifidis.) "Filaments branched at the extremity ; branches ſimple." *Filaments* long, ſimple, the greateſt part of their length, once or twice branched at the end, of a dull pale colour, white when dry. 82. C. *fracta.* Flor. Dan. tab. 946. Dillw. 14. (C. divaricata ; Roth Cat. Bot. i. 179. tab. 3. fig. 1.) "Filaments much branched, matted ; branches and branchlets divaricated ; older joints oblong ; younger ones cylindrical ; capſules ſeſſile, roundiſh." *Filaments* from one to four inches long, the thickneſs of human hair, dark green, rather rigid, generally floating, in denſely entangled maſſes, on the ſurface of ſtagnant water ; branches abruptly terminated, ſo as to give the plant a broken appearance. 83. C. *vivipara.* Dillw. 59. "Filaments dichotomouſly branched ; branches zig-zag, bulbiferous at the partitions ; bulbs terminated by a long hair ; joints long ; capſules lateral, ſeſſile." *Filaments* in ſmall, ſlender, buſhy tufts, commonly not more than two lines long, never exceeding half an inch, yellowiſh green ; joints five times as long as thick. *Capſules* at ſome of the partitions ; bulbs at the others. In boggy rivulets on ſtones, moſs, and other ſubſtances. 84. C. *gelatinoſa.* Linn. Sp. Pl. 13. Lam. 13. Smith Eng. Bot. 689. Dillw. 32. (C. fontana nodoſa ſpermatis ranarum inſtar major et fuſca ; Dill. 36. tab. 7. fig. 42. Chara batrachoſperma ; Weis Gott. 33. tab. 1. Batrachoſpermum moniliforme ; Roth Cat. Bot. 2. 187.) "Filaments much branched, beaded, ſlippery ; branchlets very ſlender, pencil-ſhaped, ſomewhat verticillated, very compound, bearing the fruit ; partitions obſcure, joints rather ſhort ; capſules roundiſh with many ſeeds." From one to ſix inches long, reſembling frogs ſpawn, dark purple or yellowiſh green. β minor et viridis ; Dill. 37. tab. 7. fig. 43. δ. Hudſ. C. filamentis nodoſis et cæruleis ; Dill. fig. 43. But from ſome ſpecimens gathered in an alpine lake on Snowden, Mr. D. Turner is dubious whether it be not a diſtinct ſpecies ; its ſtems being quite hard, and its moniliform appearance very faint. In clear ſprings and ſtreams. 85. C. *mutabilis.* Roth Cat. Bot. 1. 197. Dillw. 12. Smith Eng. Bot. 1740. (C. gelatinoſa γ Hudſ. C. ſtagnalis, globulis vireſcentibus mucoſis ; Dill. 38. tab. 7. fig. 44) "Filaments much branched, gelatinous, ſomewhat beaded ; branchlets compound,

pound, tufted; partitions contracted; joints ſhort." Varying in length from half an inch to three inches, and from a light to a dark green. Main ſtems remarkably pale and pellucid; branches darker; joints ſhort. In pools and ditches, not uncommon. 86. C. *atra.* Hudſ. p. 597. Smith Eng. Bot. 692. Dillw. 11. (C. fontana, nodoſa, lubrica, filamentis tenuiſſimus nigris; Dill. 39. tab. 7. fig. 46.) "Filaments much branched, beaded, ſomewhat gelatinous; branchlets briſtle-ſhaped; joints dilated towards the tip, ciliated; ciliæ verticillated, imbricated." Varying in colour, during different ſtages of its growth, from a pale to a dark green, and finally becoming black. In clear rivulets and ſprings, but rare. 87. C *fluviatilis.* Linn. Sp. Pl. 12. Lam. Pl. Dillw. 29. (C. lubrica, ſetoſa, equiſeti facie; Dill. 39. tab. 7. fig. 47. C. nodoſa, fucum æmulans; Dill. 37. tab. 48. C. toruloſa. Roth Cat. Bot. 1. 202.) "Filaments branched, rather rigid; branches and branchlets generally alternate, attenuated each way; partitions ſwollen, tubercled; joints long, dilated at both ends." *Filaments* ſix or eight inches long, dull olive or greeniſh purple; ſometimes nearly ſimple, when they are ſhorter, thicker, and more rigid. Dill. 48. Dillwyn has ſeen theſe different filaments growing from one root. In rapid, rocky ſtreams. 88. C. *lubrica.* Dillw. 57. "Filaments much branched, ſlender, very long, ſhining, ſlippery; branches thorn-like; joints rather ſhort." *Filaments* from ſix inches to near a foot long, green, with a ſlight tinge of blue, branches ſcattered, forming an acute angle with the ſtem. In clear rivulets attached to ſtones and wood in large gelatinous maſſes. 89. C. *protenſa.* Dillw. 67. "Filaments much branched; branches diffuſe, much lengthened out, pellucid at the tip; joints rather long." *Filaments* from two lines to a half or three quarters of an inch long, light green. In rivulets and ſprings, on ſtones and aquatic plants. 90. C. *glomerata.* Linn. Sp. Pl 19. Lam. 19. Flor. Dan. tab. 651. fig. 2. Dillw. 13. (C. fontinalis ramoſiſſima glomeratim congeſta. Dill. 28. tab. 5. fig. 31. C. criſtata; Roth Cat. Bot. 1. p. 193. 2. p. 220.) "Filaments much branched; branches alternate; branchlets unilateral, faſciculated, pencil-form; partitions pellucid; joints cylindrical, rather long." *Filaments* from two or three inches to a foot long, yellowiſh green. On ſtones and wood in clear rivers and ſtreams. 91. C. *rigida.* Hudſ. Flor. Ang. 594. (C. fluviatilis fibrilloſa ſubrigida; Dill. 21. tab. 4. fig. 16.) "Filaments much branched, rather rigid; branchlets alternate, very ſhort." *Filaments* ſeveral from the ſame baſe, ſo as to have a cluſtered appearance, and ſometimes to cover the pebble to which they are attached, dull green, often inclining to brown. Somewhat hairy; branchlets moſt numerous near the ſummits of the filaments. In clear ſtreams. 92. C. *canalicularis.* Linn. Sp. Pl. 4. Lam. 4. (C. rivulorum capillacea denſiſſime congeſtis ramulis; Dill. 21. tab. 5. fig. 15.) "Filaments moſt branched near the baſe; branches long." *Filaments* one or two inches long, ſlender, deep green, ſimple or but little branched above the middle, of a ſpongy ſoft ſubſtance, denſely matted together ſo as to reſemble a piece of velvet, ſoft and herbaceous when freſh, but when dry blackiſh, and acquiring almoſt a ſtony hardneſs from the mud adhering to it. In pure ſtreams and mill-pond water ſpouts. 93. C. *bulloſa.* Linn. Sp. Pl. 3. Lam. 3. (C. paluſtris bombycina; Dill. 18. tab. 3. fig. 11. "Filaments branched, matted, incloſing air bubbles." *Filaments* from three to nine inches or a foot long, ſlender, dull yellowiſh green. In clear waters, ſoft, ſomewhat ſilky, and of a livelier green; in ſtagnant muddy waters, paler, tomentous, reſembling dirty cotton. Profeſſor Martens is of opinion that C. fracta is the plant intended by Linnæus, and ſince called C. bulloſa; but Mr. Dillwyn obſerves that the ſpecimen in Dillenius's herbarium, here deſcribed, is certainly another ſpecies, and agrees with Mr. D. Turner in thinking, that ſeveral diſtinct plants which have the property of retaining bubbles of air have been confounded by authors, and conſequently that the confervæ bulloſæ are a family and not a ſpecies. Theſe confervæ when dried have been uſed as wadding for ſtuffing garments, and have been woven into coarſe houſehold linen. 94. C. *diſtorta.* Flor. Dan. tab. 820. Dillw. 22. "Filaments branched, jointed, faſciated with tranſverſe lines; branches and branchlets diſtorted; partitions obſolete; joints ſhort." *Filaments* about half an inch long, extremely ſlender, of a beautiful dark green colour varying to a lighter colour as they approach to decay; branches ſeldom numerous, but with a very peculiar twiſt at their ramifications. Paraſitical in ſhort thick tufts on decaying graſs, attached to ſmall pieces of which it frequently floats on the ſurface of the water. Hitherto found in Great Britain, only by Mr. Dillwyn, in a boggy pool on Sketty Burroughs, near Swanſea. 95. C. *ægagropila.* Linn. Sp. Pl. 21. Lam. 21. Smith Eng. Bot. 1377. Dillw. 87. "Filaments much branched, cluſtered into a globe and divaricating from the centre; branches and branchlets nearly unilateral, ſtraight, obtuſe; joints long, cylindrical." From the ſize of a pea to three or four inches in diameter, always pretty exactly ſpherical, hollow within, without any ſolid body, or root, to which the filaments might originally have been attached. The ſpecific name alludes to the hairy balls found in the ſtomach of goats. In lakes lying in great abundance at the bottom of the water. 96. C. *nana.* Dillw. 30. "Filaments branched, very minute; branches and branchlets generally alternate, acuminate; partitions pellucid; joints cylindrical." *Filaments* ſeldom much more than half a line long, of a pale brown colour tinged with brown, reſembling C. littoralis in its ramification, and remarkably acuminate branches. Paraſitical on decayed confervas, &c. in rocky rivers. 97. C. *typhloderma.* Dillw. 83. "Filaments nearly ſimple, denſely matted; partitions obſcure; joints ſhort." The extreme tenuity and entangled growth of the filaments makes it impoſſible to aſcertain their length; their colour is a dull olive green. Obſerved in a bottle which contained a ſolution of gum dragon in water, the ſurface of which was covered with a maſs of filaments ſo denſely interwoven as to form a film about two lines in thickneſs, bearing a conſiderable reſemblance to the ſkin of a mole. 98. C. *ochracea.* Dillw. 62. Roth Cat. Bot. 1. 65. tab. 5. fig. 2. "Filaments much branched, very ſlender, very brittle, cloſely compact, conſtituting an ochraceous jelly, which at length breaks into fragments of ſeparate filaments." The filaments are ſo extremely fragile that the ſlighteſt touch or any conſiderable agitation of the water breaks them into a thouſand pieces, which at firſt remain ſuſpended, and afterwards ſink to the bottom in the form of an ochraceous powder. In this ſtate only can the plant be examined, but the fragments are ſo ſmall that it is impoſſible to aſcertain their original length, and under the higheſt magnifiers their thickneſs ſcarcely ſeems equal to that of the human hair. In pools and ditches common, of a dull yellow colour. 99. C. *lactea.* Dillw. 79. Roth Cat. Bot. 1. p. 216. 3. p. 292. (C. puſilla; Roth Flor. Germ. 1. 524.) "Filaments much branched, gelatinous, ſlippery; branches rod-like, alternate from each partition; partitions contracted; joints very long, glaſſy-tranſparent." *Filaments* growing in gelatinous maſſes at the bottom of ditches and rivulets, from half an inch to three or four inches long, of a dirty white colour; branches cluſtered, ſo as to give them a bruſh-like appearance; partitions of a duſky colour. *Joints* at leaſt ten times longer than thick. 100. C. *myochrous.* Dillw. 19. Smith Eng. Bot. 1555. "Filaments very denſely matted, branched; branchlets ſimple, generally unilateral, in pairs, incurved." *Filaments* ſometimes quite ſimple, generally branched, ſeldom more than half an inch long, as fine as the fineſt wool. On the rocky beds of torrents in the vale of Beddgelert, in Caernarvonſhire, matting the ſtones with a velvety covering, three or four lines in diameter, of a dark gloſſy brown colour, ſoft to the touch, which, when taken out of the water, might be compared to the ſkin of a mouſe. 101. C. *veſicata.* Dillw. 74. Muller in Nov. Act. Pet. 3. "Filaments branched, ſomewhat jointed, rigid: veſicles innate, ſolitary, elliptical, broader than the filament; capſules generally in pairs, pear-ſhaped on ſhort peduncles." *Filaments* in buſhy maſſes at the bottom of the water, ſo extremely brittle that their length cannot eaſily be aſcertained, yellowiſh green, cylindrical, filled with minute granules which iſſue from them when broken; very rough to the touch; branches few, diſtant, generally making an obtuſe angle with the ſtem. *Stems* and *branches* frequently ſwollen, with bladder-like veſicles, four or five times thicker than the filaments, reſembling thoſe of fucus nodoſus. *Partitions* irregularly diſpoſed, always at a great diſtance from each other. 102. C. *amphibia.* Linn. Sp. Pl. 5. Lam. 5. Dillw. 41. (C. amphibia fibrilloſa et ſpongioſa; Dill. 22. tab. 4. fig. 7. B and C). "Filaments ſomewhat jointed, branched, denſely matted; branches ſpreading, remote; branchlets, when not immerſed, collecting into ſharp briſtly points; partitions but little contracted; capſules ſeſſile, ſomewhat elliptical." β. branches elongated (C. furcata; β. Hudſ. Ceramium coeſpitoſum; Roth Cat. Bot. 1. p. 154. 2. p. 186. C. paluſtris filamentis brevioribus et craſſioribus; Dill. 17. tab. 3. fig. 10.) Filaments very various in length, according to the ſituation, bright green, becoming aſh-coloured with age; α is the plant as it grows on the edges of ditches, and in ſhallow water, where it is not wholly immerſed. In ſuch ſituations, it frequently occurs in maſſes, ſo denſely matted as to hold water like a ſponge, with its ſurface beſet by erect branches, which give it a briſtly appearance. In floods, when the waters overflow the plant, the length of the filaments is gradually increaſed, and forms Mr. Dillwyn's β; but when the waters ſubſide, the filaments, again expoſed to air, take of courſe an horizontal direction, and again throw out erect ſpreading branchlets, which, on being dried, collapſe ſo as to form rather ſtiff points. In rivers, the branches are frequently carried out by the force of the ſtream to a great length, and in that caſe do not aſſume a briſtly appearance when expoſed to air; probably owing to the leſs ſpongy nature of the maſs, in conſequence of which the water is not ſo readily tranſmitted to the upper ſurface, as to enable it to make freſh ſhoots. The plant has a mouldy ungrateful ſmell, and is much uſed as a ſhelter by aquatic inſects.

* * *Not immerſed.*

103. C. *atro-virens.* Dillw. 25. "Filaments rather rigid, branched; branches divaricated, ſomewhat unilateral, attenuated at both ends, rather obtuſe; partitions pellucid; joints very ſhort, marked with three points." *Filaments* from a quarter to half an inch long, growing in thick buſhy tufts, of a blackiſh green colour, not unfrequently intermixed with muſci. On the wet rocks, forming the banks of the river Dylais, near Neath. 104. C. *frigida.* "Filaments not jointed, creeping, branched; Dillw. 16. (Ceramium Dillwynii; Roth.) "Filaments not jointed, creeping, branched; branches alternate; capſules ſeſſile, round." *Filaments* about an inch long, a little finer than human hair, of a pale green colour, growing in looſe irregular patches, two or three inches in diameter, very ſlightly adhering to the ſoil. On the ground in moiſt ſhady places, particularly in turnip fields, with a northern expoſure, during the winter and early months of ſpring. The frigida of Dr. Roth is a different plant, referred by him to Dill. tab. 4. fig. 17, A. 105. C. *umbroſa.* Dillw. 61. Roth Cat. Bot. 1. 191. tab. 4. fig. 3. (C. arenaria; Roth Cat. Bot. 2. 217?) "Filaments branched, creeping, fragile, ſhort-obtuſe; branches curved, ſimple, ſomewhat unilateral: joints long, ſometimes cylindrical, ſometimes inflated." Growing in ſmaller patches, and of a darker colour, than C. frigida. *Filaments* ſcarcely half an inch long; joints varying greatly in ſhape and length. 106. C. *pallida.* Dillw. 78. "Filaments dichotomous, curved, zig-zag, faſtigiate angles of the diviſions roundiſh; joints very long." *Filaments* conſiderably finer than human hair, a light yellowiſh brown, matted together into denſe leathery maſſes, about an inch long, and the thickneſs of a ſhilling; joints at leaſt eight or ten times broader than thick. Found on ſome yellow ochre, in a pot of iſinglaſs ſize. 107. C. *multicapſularis.* Dillw. 71. "Filaments minute, creeping, olive-coloured; branches erect, generally ſimple, ſhort, thickened towards the top, and bearing the capſules; capſules cluſtered, ſpherical." *Filaments* very minute, thickly entangled, growing in ſmall irregular patches. *Joints* in the creeping ſtem very long; in the branches ſhorteſt at the baſe, and longeſt towards the ſummit. *Capſules* terminating the branches, diſcharging the ſeeds at the orifice. On clayey banks, in high expoſed ſituations. 108. C. *rubiginoſa.* Dillw. 72. Smith Eng. Bot. 1701. "Filaments creeping, branched, entangled, alternately bipinnate; branches divaricated, tapering, acute; joints elongated, cylindrical." *Filaments* creeping in looſe entangled maſſes, among moſſes, over dead ſtalks and ſticks, and along the ground, of a brown cheſnut colour; branches from a quarter to half an inch long; pinnæ and pinnulæ variouſly curved, nearly at right angles with the ſtem and branches; partitions almoſt black; joints in the ſtem and main branches three or four times longer than broad. On hedge banks. 109. C. *rubiginoſa.* Dillw. 68. "Filaments much branched, rigid, rather erect; branches zig-zag, ſpreading, matted together ſo as to form nearly a ſolid maſs; joints long." *Filaments* very minute, growing in irregular patches, about an eighth of an inch in thickneſs, of a ruſty brown colour, entirely deſtitute of gloſs. *Joints* viſible only under the higheſt powers of the microſcope, about four times longer than broad. On rotten wood, ſecluded from the light. 110. C. *velutina.* Dillw. 77. Smith Eng. Bot. 1556. "Filaments creeping, branched, matted; branches erect, alternate, or unilateral, curved, obtuſe; joints ſlightly ſwelling, at leaſt twice as long as broad." Diſtinguiſhed by its ſweet ſcent. (See Byssus *volutina.*) Jointed ſtructure firſt diſcovered by Mr. J. D. Sowerby. 111. C. *aurea.* Dillw. 35. "Filaments branched, gold-coloured, minute; branches long, ſpreading, rather rigid, ſomewhat incurved; partitions pellucid; joints longiſh." (See Byssus *aurea.*) Jointed ſtructure, firſt diſcovered by Mr. Dillwyn. 112. C. *purpurea.* Dillw. 43. "Filaments dichotomous, flexible, minute; dichotomous, branches approximate; partitions obſcure; joints longiſh." (See Byssus *purpurea.*) 113. C. *lichenicola.* Smith Eng. Bot. 1609. "Filaments red, upright, crowded, alternately branched; roughiſh; joints ſwelling, about as long as broad." *Filaments* ſcarcely a line long, forming thick tufts, and appearing to the naked eye like brick-duſt. Paraſitical on cruſtaceous

lichens. 114. C. *muſcicola.* Smith Eng. Bot. 1638. "Filaments ruſty brown, upright, crowded, much and irregularly branched; joints cylindrical, twice as broad as long." *Filaments* two or three lines long, crooked, divaricated, of equal thickneſs throughout, gloſſy, like human hair under a microſcope; branches aſcending, obtuſe, frequently unilateral. Paraſitical on orthotricum ſtriatum.

Obſ. The term confervæ occurs, we believe, firſt in the Natural Hiſtory of Pliny, and was applied by him to a freſh water ſpecies of the preſent genus. The name was extended to two or three ſpecies by the elder modern botaniſts. But this part of the ſcience was not at all ſtudied before the time of Dillenius, who, in his admirable "Hiſtoria Muſcorum," has deſcribed and figured forty-eight ſpecies, partly marine, and partly growing in freſh water. Theſe he has diſtributed under three *orders*, as he calls them, *viz.* 1. Equabili filo protenſæ ſeu non geniculatæ. 2. Geniculatæ; and, 3. Nodoſæ; dividing the firſt order into ſimple and branched; ſucceeding authors, for a conſiderable time, ſeem to have ſuppoſed that Dillenius had exhauſted the ſubject. Linnæus has given only twenty-one ſpecies, adding only C. ægrapopila to thoſe which are already deſcribed by that great cryptogamiſt, omitting ſuch as he was not able to identify, and conſidering ſome as mere varieties. La Marck, in Encyclopedie Methodique, has done nothing more than copy the Linnæan ſpecies, in exactly the ſame order. Hudſon, in the ſecond edition of his "Flora Anglica," has introduced ſeveral ſpecies, not known either to Dillenius or Linnæus. Lightfoot, in his "Flora Scotica," has alſo made one or two additions. But it is not more than ſix or ſeven years ſince rapid advances have begun to be made in the knowledge of confervæ. Mr. D. Turner and Mr. Dillwyn are now diligently employed in the inveſtigation of the Britiſh ſpecies; ſeveral foreign botaniſts, profeſſor Roth in particular, are ſucceſsfully engaged in the ſame purſuit; and we are informed by Boſc, in "Nouveaux Dictionaire d'Hiſtoire Naturelle," that profeſſor Draparnaud of Montpellier is now buſy in preparing a Monographia Confervarum, and has already determined ſeveral hundred ſpecies. We have been induced to confine ourſelves, with a ſingle exception, to the Britiſh ſpecies; partly by our inability to procure all the works which are neceſſary for a complete account of what has hitherto been done by foreign botaniſts; but chiefly by the conſideration, that the ſpecies which belong to the Flora of the Britiſh iſlands, are the only ones acceſſible to the greater part of our readers. Our knowledge of theſe plants is indeed ſtill very imperfect, and no generic character has yet been formed, which is ſufficiently diſcriminating and comprehenſive. The jointed ſtructure of the filaments has generally been conſidered as an eſſential character; but we have been led by the high authority of Mr. Dillwyn to admit one ſpecies (n. 104.) which has not this conformation. We have already ſeen that the fructification of ſeveral ſpecies does not conſiſt of *cloſed tubercles*, as it is deſcribed even in Dr. Smith's laſt improved generic character, but of *capſules opening* at the apex, and diſcharging the ſeeds in a manner ſimilar to that obſerved in many fuci. Theſe have been ſeparated by Dr. Roth into a diſtinct genus which he calls ceramium; and it is probable that further reſearches will prove the propriety of making other ſeparations. M. Vaucher of Geneva thinks, that he has diſcovered five different modes of propagation in the plants uſually called confervæ; which has induced Decandolle to form them into ſix genera. *Conferva.* Filaments cartilaginous or herbaceous, divided by partitions; ſeeds encloſed between the partitions, and not eſcaping but by the deſtruction of the tube itſelf. *Ceramium.* Filaments membranous, cartilaginous, without partitions; capſules monoſpermous, adhering to the external ſurface of the filaments. *Vaucheria.* Filaments herbaceous, ſimple or branched, without partitions; ſeeds attached to the exterior ſide of the filaments, and generally peduncled. *Batrachoſpermum.* Filaments knotty, jointed, gelatinous; knots formed of filaments, ſimple or compound, between which are found ſeeds or ſhoots (cayeux) detaching themſelves, and conſiſting of filaments already jointed. *Chantrania.* Filaments ſolid, knotty; knots ſeparating and becoming new plants, in the way of ſlips or cuttings. *Hydrodyctium.* Tube cylindrical, cloſed at the two extremities, and anaſtomiſing into pentagonal meſhes; filaments of the pentagon ſwelling at their extremities, ſeparating and becoming themſelves cylindrical tubes, cloſed at the ends, and compoſed of pentagon meſhes. The laſt three genera, according to his ideas, have no proper ſeeds.

See ſome curious experiments by Dr. Prieſtley on a ſpecies of conferva or water-moſs of a peculiar kind, the manner of its production, and its effect, by the concurring action of light upon it, in dephlogiſticating or depurating the air to which it has acceſs, and thereby increaſing the quantity of it; in "Obſervations on Air," vol. iv. p. 335, &c. vol. v. § 2, 3, 4, 5. The ſeeds of this plant, ſays Dr. Prieſtley, float every where; in the air, on the earth, on the ſea, on the Alps, in the plains, under the poles and the equator, in ſummer and winter, and in all ſeaſons; and they are received into the water, inſinuating themſelves into veſſels of water through the ſmalleſt apertures, where they germinate. Dr. Ingenhouſz made a variety of experiments on this ſingular ſubſtance; from which he concludes, that the water itſelf, or ſome ſubſtance in the water, is converted into this kind of vegetation. It is a real tranſmutation, which may appear incomprehenſible to the philoſopher, but which, in reality, is not more extraordinary than the change of graſs and other vegetables into greaſe in the bodies of granivorous animals, and the change of the aqueous juice of the olive into oil. Dr. Prieſtley, however, obſerves, that the change of water into an organized plant is a thing of a very different nature from theſe, and tends to revive the long exploded doctrine of equivocal or ſpontaneous generation. Dr. Girtanner of Gottingen (ſee Annales de Chemie, No. 100.) traces its formation from azot, which is a conſtituent principle of bodies, in the following manner. When water is expoſed to the ſun the light decompoſes it, and diſengages the oxygen in a large quantity. The hydrogen then retains the laſt portions of the oxygen; azot is formed, and announces itſelf by its green colour; the water is more and more decompoſed; more of the oxygen, which, in the opinion of this writer, is the principle of life and irritability in organized nature, becomes fixed; and this azot, produced from water by means of the ſun, is an organized body, the "conferva fontinalis;" a plant which lives, expands, and perpetuates its ſpecies. The influence of the ſolar light is, he conceives, abſolutely neceſſary for this converſion of water into a plant or organized azot. No degree of heat can ſupply its place. Mr. Senger of Reek, in Weſtphalia, has lately diſcovered, that the conferva affords next to ſage, one of the fitteſt materials for the making of paper; in conſequence of which he obtained the honour of a gratuity from the court of Berlin, and alſo a patent for the manufacture of paper from this ſubſtance. From his experiments it likewiſe appears, that the conferva, after a previous preparation, might be made a ſubſtitute for cotton-wool, and a ſuccedaneum for feathers in beds.

CONFESS *and avoid*, in *Law*, a ſpecies of REPLICATION, in which the plaintiff introduces ſome new matter or diſtinction, conſiſtent with his former declaration; as, in an action of treſpaſs upon lands of which the plaintiff is ſeiſed; if the defendant ſhews a title to the land by deſcent, the plaintiff may either deny the fact, or *confeſs and avoid* it, by replying, that ſuch deſcent happened, but that the defendant hath ſince demiſed the lands to the plaintiff for the term of life. Blackſt. Com. vol. iii. p. 310.

CONFESSION, CONFESSIO, in *Rhetoric*, the ſame with what is otherwiſe called PARHOMOLOGY.

CONFESSION, in a *Civil Senſe*, a declaration or acknowledgment of ſome truth, though it be againſt the intereſt of the party who makes it; whether it be in a court of juſtice, or out of it. It is a maxim, that in civil matters, the confeſſion is never to be divided, but always taken entire; and that a criminal is never condemned on his ſimple confeſſion, without other collateral proofs; nor is a voluntary extra-judicial confeſſion admitted as any proof. A perſon is not admitted to accuſe himſelf, according to that rule in law, *non auditer perire volens*.

CONFESSION *of Action*, in *Law*, is a ſpecies of plea to the action, in which the merits of the complaint are anſwered, by confeſſing either wholly, or, which is moſt common, in part. A confeſſion of the whole complaint is not very uſual, for then the defendant would probably end the matter ſooner; or not plead at all, but ſuffer judgment to go by default. Yet ſometimes, after tender and refuſal of a debt, if the creditor haraſſes his debtor with an action, it then becomes neceſſary for the defendant to acknowledge the debt, and plead the tender; adding that he has always been ready, "tout temps priſt," and ſtill is ready, "uncore priſt" to diſcharge it: for a tender by the debtor, and refuſed by the creditor, will, in all caſes, diſcharge the coſts, (1 Ventr. 21.) but not the debt itſelf; though in ſome particular caſes the creditor will totally loſe his money. (Litt. § 338. Co. Litt. 209.) But frequently the defendant confeſſes one part of the complaint (by a "cognovit actionem" in reſpect of it,) and traverſes or denies the reſt; in order to avoid the expence of carrying that part to a formal trial, which he has no ground to litigate. A ſpecies of this ſort of confeſſion is "the payment of money into court;" which is for the moſt part neceſſary upon pleading a tender, and is itſelf a kind of tender to the plaintiff; by paying into the hands of the proper officer of the court as much as the defendant acknowledges to be due, together with the coſts hitherto incurred, in order to prevent the expence of any farther proceedings. This may be done upon what is called a "motion;" which is an occaſional application to the court by their parties or their counſel, in order to obtain ſome rule or order of court, which becomes neceſſary in the progreſs of a cauſe; and it is uſually grounded upon an "affidavit" (the perfect tenſe of the verb "affido") being a voluntary oath before ſome judge or officer of the court, to evince the truth of certain facts, upon which the motion is grounded: though no ſuch affidavit is neceſſary for payment of money into court. If, after the money paid in, the plaintiff proceeds in his ſuit, it is at his own peril; for, if he does not prove more due than is ſo paid into court, he ſhall be non-ſuited and pay the defendant's coſts; but he ſhall ſtill have the money ſo paid in, for that the defendant has acknowledged his due. Blackſt. Com. vol. iii.

CONFESSION *of Indictment*, is a priſoner's acknowledgment of the offence, when he is brought to the bar to be arraigned: upon a ſimple and plain confeſſion, which the court is backward in receiving and recording, nothing remains but to award judgment. This confeſſion is made before the judge; in conſequence of which, the priſoner ſubmits to the legal penalty annexed to his crime; or the priſoner, by confeſſion, becomes an approver, or accuſer of others. See APPROVEMENT.

There was alſo a third ſort of confeſſion, formerly made by an offender in felony, not in court before the judge, but before the coroner in a church, or other privileged place, upon which the offender, by the ancient law of the land, was to abjure the realm. 3 Inſt. 192. See ABJURATION.

There is alſo a confeſſion indirectly implied, as well as directly expreſſed, in criminal caſes; as if the defendant, in a caſe not capital, doth not directly own himſelf guilty of the crime, but by ſubmitting to a fine owns his guilt; upon which the judge may accept of his ſubmiſſion to the king's mercy. (Lamb. lib. iv. c. 9.) By this indirect confeſſion, the defendant ſhall not be barred to plead "Not guilty" to an action, &c. for the ſame fact; the entry of it is, that the defendant "puts himſelf on the king's mercy;" and of the direct confeſſion, "that he acknowledges the indictment." This laſt confeſſion carries with it ſo ſtrong a preſumption of guilt, that being entered on record, on indictment of treſpaſs, it ſtops the defendant to plead "Not guilty" to an action brought afterwards againſt him for the ſame matter: but ſuch entry of a confeſſion of an indictment of a capital crime, it is ſaid, will not ſtop a defendant to plead "Not guilty" to an APPEAL, it being in caſe of life. And where a perſon upon his arraignment actually confeſſes himſelf guilty, or unadviſedly diſcloſes the ſpecial manner of the fact, ſuppoſing that it doth not amount to felony, where it doth; the judges, upon probable circumſtances, that ſuch confeſſion may proceed from fear, weakneſs, or ignorance, may refuſe it, and ſuffer the party to plead "Not guilty". 2 Hawk. P. C. c. 31. § 2.

A confeſſion may be received, and the plea of "Not guilty" be withdrawn, though recorded. (Kel. 11.) The confeſſion of the defendant, whether taken upon an examination before juſtices of peace, in purſuance of the 1 and 2 P. & M. c. 13. or 2 and 3 P. & M. c. 10. upon an offender's being bailed or committed for felony; or taken by the common law, upon an examination before a ſecretary of ſtate, or other magiſtrate, for treaſon or other crimes, is allowed to be given in evidence againſt the party confeſſing; but not againſt others. Alſo two witneſſes of a confeſſion of high treaſon, upon an examination before a juſtice of peace, were ſufficient to convict the perſon ſo confeſſing, within the meaning of 1 Ed. VI. c. 12. and 5 & 6 Ed. VI. c. 11. which required two witneſſes in high treaſon; unleſs the offender ſhould willingly confeſs, &c. But the ſtat. 7 W. c. 3. requires two witneſſes, except the party ſhall *willingly*, without violence, confeſs, &c. *in open court*. 2 Hawk. P. C. c. 41. § 3.

A demurrer amounts to a confeſſion of the indictment as laid, ſo far, that if the indictment be good, judgment and execution ſhall go againſt the priſoner. (Bro. 86. S. P. C. 150. H. P. C. 246.) And in criminal caſes, not capital, if the defendant demurs to an indictment, &c. whether in abatement, or otherwiſe, the court will not give judgment againſt him to anſwer over, but final judgment. (2 Hawk. c. 32. § 7.) See ABATEMENT. Where a priſoner confeſſes the fact, the court has nothing more to do than to proceed to judgment againſt him. "Confeſſus in judicio pro judicato habetur." 11 Rep. 30. 4 Inſt. 66. 2 Hawk. P. C. c. 32.

CONFESSION, in *Theology*, denotes the verbal acknowledgment which a penitent makes of his ſins to God: in a more partial and reſtricted ſenſe, it is a declaration of a perſon's ſins, made to a prieſt, in order to obtain abſolution for the ſame. The Romiſh church makes confeſſion a part of the ſacrament of penance.

Confeſſion was anciently public and general, in the face of the church; though the Romaniſts have ſince altered it, and made it private and auricular.

Confeſſions are to be buried in eternal ſilence, under pain of the greateſt puniſhment to the prieſt who reveals them. Bellarmin, Valentia, and ſome other Romiſh controverſial writers, endeavour to trace up auricular confeſſion to the earlieſt ages; and thus contend for a point given up by the reſt. M. Fleury owns, that the firſt inſtance of auricular confeſſion he can meet with, is that of St. Eloi, who, being grown old, made a confeſſion to a prieſt of all his ſins from his youth upwards.

Secret confeſſion was firſt decreed and eſtabliſhed in the 4th council of Lateran, under Innocent III., in 1215, cap. 21. And the decree of this council was afterwards confirmed and enlarged in the council of Florence, and in that of Trent (ſeſſ. 14. cap. 5.), which expreſsly ordains, that confeſſion was inſtituted by Chriſt, and that by the law of God it is neceſſary to ſalvation; and that it has been always practiſed in the Catholic church. Hard. Concil. tom. vii. p. 35. and tom. x. p. 92. See POPERY.

The Indians, according to Tavernier, have a kind of confeſſion; and the ſame may be ſaid of the Jews: theſe laſt have formulas for thoſe who are not capable of making a detail of all their ſins: the ordinary form is in alphabetical order, each letter containing a capital ſin. This they uſually rehearſe on Mondays and Thurſdays, and on faſt-days, and other occaſions; ſome every night and morning. When any of them find themſelves near death, they ſend for ten perſons, more or leſs, one of them a rabbin; and in their preſence recite the confeſſion. See Leo de Modena.

CONFESSSION *of faith*, denotes a liſt, or enumeration and declaration of the ſeveral articles of belief, in a church. See ARTICLES *of faith*.

In the council of Rimini, the Catholic biſhops found fault with dates in a confeſſion of faith, and obſerved that the church never uſed to date them.

CONFESSION, *Augſburg* or *Auguſtan*. See AUGUSTAN *Confeſſion*.

CONFESSIONAL, or CONFESSIONARY, in *Church Hiſtory*, a place in churches, uſually under the main altar, wherein were depoſited the bodies of deceaſed ſaints, martyrs, and confeſſors.

CONFESSIONAL is alſo uſed in the Romiſh church for a little box, or deſk in the church, where the confeſſor takes the confeſſions of the penitent.

CONFESSO, *Pro*-CONFESSO. See PRO-CONFESSO.

CONFESSOR, a Chriſtian, who has made a ſolemn, and reſolute profeſſion of the faith, and has endured torments in its defence. A mere ſaint is called a confeſſor, to diſtinguiſh him from the roll of dignified ſaints; ſuch as *apoſtles*, *martyrs*, &c.

The title of confeſſors was given in the early ages of the church, and particularly towards the commencement of the firſt century of the Chriſtian æra, to thoſe, who, in the face of death, and at the expence of honour, fortune, and all the other advantages of the world, had confeſſed with fortitude, before the Roman tribunals, their firm attachment to the religion of Jeſus.

In eccleſiaſtical hiſtory we frequently find the word confeſſors uſed for martyrs; in after-times, it was confined to thoſe who, after having been tormented by the tyrants, were permitted to live and die in peace. And at laſt it was alſo uſed for thoſe who, after having lived a good life, died under an opinion of ſanctity. According to St. Cyprian, he who preſented himſelf to torture, or even to martyrdom, without being called to it, was not called a *confeſſor*, but a *profeſſor*: and if any out of a want of courage abandoned his country, and became a voluntary exile for the ſake of the faith, he was called *exterris*.

The veneration that was paid to both martyrs and confeſſors in the early ages of the Chriſtian church is hardly credible. The diſtinguiſhing honours and privileges they enjoyed, the authority with which their counſels and deciſions were attended, would furniſh ample matter for an intereſting hiſtory. Without doubt it was both wiſe and juſt to treat with reſpect, and to inveſt with extraordinary privileges, thoſe Chriſtian heroes, ſince nothing was more adapted to encourage others to ſuffer with chearfulneſs in the cauſe of Chriſt. Nevertheleſs, as the beſt and wiſeſt inſtitutions were generally perverted by the weakneſs or corruption of men, from their original purpoſe; ſo the authority and privileges granted, in the beginning, to martyrs and confeſſors, became, in proceſs of time, a ſupport to ſuperſtition, an incentive to enthuſiaſm, and a ſource of innumerable evils and abuſes. See MARTYR.

CONFESSOR is alſo a prieſt, in the Romiſh church, who has a power to hear ſinners in the ſacrament of penance, and to give them abſolution. See SHROVE-TIDE.

The church calls him in Latin *confeſſarius*, to diſtinguiſh him from *confeſſor*, which is a name conſecrated to ſaints. The confeſſors of the kings of France, from the time of Henry IV. have been conſtantly Jeſuits: before him the Dominicans and Cordeliers ſhared the office between them. The confeſſors of the houſe of Auſtria have alſo, ordinarily, been Dominicans and Cordeliers; but the latter emperors have all taken Jeſuits.

CONFESSOR *to his Majeſty*. See CLERK *of the cloſet*.

CONFIDENCE, in *Military Language*, denotes a firm reliance on the ſkill, courage, conduct, &c. of an individual. It is of the firſt importance for the commander of an army to have the entire confidence of the officers and ſoldiers under his command. This was remarkably the caſe with Hannibal, Julius Cæſar, &c. among the ancients, and with the marſhal de Turenne, John duke of Marlborough, &c. among the moderns. A general, in whom his troops have confidence, may gain a victory without employing much military ſkill; and on the other hand, the moſt ſkilful general may loſe one, who has loſt the confidence of his army.

CONFIGURATION, the exterior ſurface, that bounds bodies, and gives them their particular figure.

That which makes the ſpecific difference between bodies, is the different configuration, and the different ſituation of their parts. A ſhort, or a long ſight, depend on the different configuration of the cryſtalline.

CONFIGURATION *of the planets*, in *Aſtronomy* and *Aſtrology*, is a certain diſtance or ſituation of the planets in the zodiac, whereby they are ſuppoſed to aid, or oppoſe each other. See ASPECT and SATELLITES.

CONFIGURATIONS *of ſalts*, a term uſed by ſome to expreſs the combinations of the particles of the ſalts of plants, and other ſubſtances, into certain figures, on evaporating the water in which they had been diſſolved, ſo haſtily as not to admit of their ſhooting into their own regular cryſtals. See CRYSTALLIZATION.

CONFINEMENT *to the realm*. See NE *exeat regnum*.

CONFIRMATION, in a general ſenſe, the act of ratifying or rendering a title, claim, pretenſion, report, or the like, more ſure and indiſputable.

CONFIRMATION, in *Law*, denotes the conveyance of an eſtate, or right *in eſſe*, which a perſon hath in or to lands, &c. from one man to another that hath the poſſeſſion or ſome eſtate in it, whereby a voidable eſtate is made ſure and unavoidable, or a particular eſtate is increaſed, or poſſeſſion made perfect: and it is particularly uſed for the ſtrengthening or homologating an eſtate of one already in poſſeſſion of it by a voidable title. Thus, if a biſhop grant his chancellorſhip by patent, for term of the patentee's life; this is no void grant: yet it is avoidable by the biſhop's death, except it be ſtrengthened alſo by the confirmation of the dean and chapter. 1 Inſt. 295.

CONFIRMATION is alſo defined to be the approbation or aſſent to an eſtate already created: which as far as it is in the power of the confirmer, makes it good and valid; ſo that the confirmation doth not regularly *create an eſtate*, yet ſuch words may be blended in the confirmation as may create and enlarge an eſtate; but this takes place by the force of ſuch words as are foreign to the buſineſs of confirmation, and by their own force and power, tend to create the eſtate. Gilb. Ten. 75. A confirmation, ſays judge Blackſtone, is of a nature nearly allied to a releaſe; and the words of making it are theſe "have given, granted, ratified, approved, and confirmed." (Litt. § 515. 531.) An inſtance of the firſt branch of the above definition is, if tenant for life leaſeth for 40 years, and dieth during that time; here the leaſe for years is voidable by him in reverſion; yet, if he hath confirmed the eſtate of the leſſee for years, before the death of the tenant for life, it is no longer voidable but ſure. (Litt. § 516.) The latter branch, or that which tends to the increaſe of a particular eſtate, is the ſame in all reſpects with that ſpecies of releaſe, which operates by way of enlargement.

Madox ſays, that moſt ancient confirmations, made after the conqueſt, often run like feoffments; and are diſtinguiſhable from them, chiefly by ſome words inſerting a former feoffment or grant. In former times, when feoffees were frequently diſſeiſed of their lands upon ſome ſuggeſtion or other, charters of confirmation ſeem to have been in great requeſt. Poſſeſſors of lands, &c. ſeemed not to have thought themſelves ſecure againſt the king, or the great lords who were their feoffors, or in whoſe lands their fees lay, unleſs they had repeated confirmations from them, their heirs or ſucceſſors. And theſe ancient confirmations ſeem to have been ſometimes made, either by precept or writ from the king, or other lords, to put the feoffees, or their heirs or ſucceſſors into ſeiſin, after they had been diſſeiſed, or to keep them in their ſeiſin undiſturbed, or elſe by charter of expreſs confirmation. Confirmation is "*perficiens, creſcens*, or *diminuens*:" *perficiens*, as if feoffee upon condition make a feoffment, and the feoffor confirm the eſtate of the ſecond feoffee;—*creſcens*, which always enlarges the eſtate of a tenant; as tenant for years to hold for life, &c.;—and *diminuens*, as when the lord of whom the land is holden, confirms the eſtate of his tenant, to hold by a leſs rent. 9 Rep. 142.

The lord may diminiſh the ſervices of his tenant by confirmation; but not reſerve new ſervices, ſo long as the former eſtate in the tenancy continues; and therefore if he confirm to the tenant, to yield him a hawk, &c. yearly, it is void. (Litt. § 539. 1 Co. Inſt. 296.) Leaſes for years may be confirmed for part of the term, or for part of the land, &c.; but an eſtate of freehold, being entire, cannot be confirmed for part of the eſtate. (5 Rep. 81.) There may be a confirmation implied by law, as well as expreſs by deed; where the law by conſtruction confirms a grant made to another purpoſe: and a confirmation may enlarge an eſtate, from an eſtate held at will to term of years, or a greater eſtate, from an eſtate for years to an eſtate for life; from an eſtate for life, to an eſtate in tail, or in fee; and from an eſtate in tail to an eſtate in fee-ſimple. (1 Inſt. 305. 9 Rep. 142. Dyer. 263.) But if the confirmation be made to leſſee for life or years, of his term or eſtate, and not of the land, this doth not increaſe the eſtate; though if the leſſee confirm the land, to have and to hold to the leſſee and his heirs, this will enlarge the eſtate, and ſo of the reſt. Co. Litt. 299. Plowd. 40.

In every good confirmation, there may be a precedent rightful or wrongful eſtate in him to whom made, or he muſt have the poſſeſſion of the thing as a foundation on which the confirmation is to be eſtabliſhed; the confirmer muſt have ſuch an eſtate and property in the land, that he may thereby be enabled to confirm the eſtate of the confirmee; the precedent eſtate muſt continue till the confirmation come, ſo that the eſtate to be increaſed comes into it; and it is required that both theſe eſtates be lawful. Co. Litt. 296. 1 Rep. 146. Dyer. 109. 5 Rep. 15. If tenant for life make a leaſe for years to one perſon, and afterwards leaſe the land to another perſon for years; and he in reverſion confirms the laſt leaſe, and after that the firſt leaſe, this is not good; the ſecond leſſee hath an intereſt before by the confirmation of him in reverſion. But in a like caſe, confirmation of the firſt leaſe, after the ſecond was confirmed, has been held good; for the leaſe takes no intereſt by the confirmation, but only to make it durable and effectual. Moor. c. 180. 1 Inſt. 296. Plowd. 10. If a diſſeiſee confirm the land to the diſſeiſor but for one hour, one week, a year, or for life, &c. it is a good confirmation of the eſtate for ever; and if he confirm the eſtate of the diſſeiſor without any word of heirs, he hath a fee-ſimple; and if a diſſeiſee make a gift in tail, and the diſſeiſee doth confirm the eſtate of the donee, it ſhall enure to the whole eſtate. (Co. Litt. 291, 297, 299.) But where the eſtate is divided it is otherwiſe; and if there be an eſtate for life, the remainder over, there the confirmation may be of either of the eſtates; and if the leſſee of a diſſeiſor of a leaſe for 20 years, make a leaſe for 10 years, the diſſeiſee may confirm to one of them and not to the other. (1 Cro. 472. 5 Rep. 81.) The tenant in tail of land hath a reverſion in fee expectant; in this caſe, the confirmation of the eſtate tail will not extend to the reverſion: &c. (Co. Litt. 297, 298.) If leſſee for years, without impeachment for waſte, accept a confirmation of his eſtate for life, he hath by this loſt the privilege annexed to his eſtate for years. (8 Rep. 76.) Acceptance of rent in ſome caſes makes a confirmation of a leaſe. (2 Danv. 128, 129.) What a perſon may defeat by his entry, he may make good by his confirmation. (Co. Litt. 300.) But none can confirm, unleſs he hath a right at the time of the grant: he who hath but a right in reverſion cannot enlarge the eſtate of a leſſee. (2 Danv. 140, 141.) As confirmation is to bind the right of him who makes it, but not alter the nature of the eſtate to him to whom made, it ſhall not diſcharge a condition. (Poph. 51. 1 Rep. 147.) A confirmation will take away a condition annexed by law; and by confirmation, a condition after broken in a deed of feoffment is extinguiſhed. (1 Co. Rep. 146.) Confirmations may make a defeaſible eſtate good; but cannot work upon an eſtate that is void in law. (Co. Litt. 295.)

A confirmation of letters patent, which are void as they are againſt law, is a void confirmation. (1 Lil. Abr. 295.)

Grants and leaſes of biſhops, not warranted by the ſtat. 32 Hen. VIII. c. 28. muſt be confirmed by dean and chapter: and grants and leaſes of parſons, &c. by patron and ordinary. (1 Inſt. 247, 300, 301.) Biſhops may grant leaſes of their church-lands for 3 lives, or 21 years, having the qualities required by the fore-cited act, and concurrent leaſes for 21 years, with confirmation of dean and chapter. (See 1 Eliz. c. 4, 19.) If a prebend leaſes parcel of his prebendary, and the biſhop, who is patron, confirms it; this ſhall not bind the ſucceeding biſhop, without confirmation of dean and chapter, becauſe the patronage is parcel of the poſſeſſions of the biſhopric; but it ſhall bind the preſent biſhop, &c. (2 Danv. 139.) If a parſon grants a rent, the confirmation of the patron and biſhop is ſufficient without the dean and chapter, and ſhall be good againſt the ſucceeding biſhop. (Ibid. 140.) The dean of Wells may paſs his poſſeſſions, with the aſſent of the chapter, without any confirmation of the biſhop. (Ibid. 135.) See Lease.

To the grants of a "ſole corporation," as parſon, prebendary, vicar, and the like, the patron muſt give his conſent; becauſe ſuch a ſole corporation has not the abſolute fee; but a "corporation aggregate," as dean and chapter, maſter, fellows and ſcholars of a college, &c. or any ſole corporation that has the abſolute fee, as a biſhop with conſent of the dean and chapter, may by the common law make any grant of their poſſeſſions without their founder or patron. (1 Inſt. 300 *b.*)

A confirmation, as we have already obſerved, is in nature of a releaſe, and in ſome things of a greater force: and in this deed, it is good to recite the eſtate of the tenant, as alſo of him that is to confirm it, and to mention the conſideration; the words *ratify* and *confirm*, are commonly uſed; but the words *give, grant, demiſe*, &c. by implication of law, may enure as a confirmation. (1 Inſt. 295. Weſt. Symb. 1. p. 457.)

Confirmation, in *Rhetoric*, is, according to Quintilian, the third part, but according to Cicero, the fourth, of an oration, wherein the orator undertakes to prove, by laws, reaſons, authorities, and other arguments, the truth of the propoſitions advanced in his narration. Cicero. De Invent. lib. i. cap. 14. 24. Quint. Inſt. Orat. l. iii c. 9.

Confirmation is either *direct*, or *indirect*: the firſt confirms what the orator has to urge for ſtrengthening his own cauſe: the ſecond, properly called *confutation*, refels the oppoſite arguing of the adverſaries. The two parts together are ſometimes placed under the head or title of Contention.

As to the forms of reaſoning uſed by orators, for the purpoſe of confirmation, the Greek writers diſtribute them under four heads; *viz. Syllogiſm, Enthymeme, Induction*, and *Example.* (See each article, and alſo Argument and Argumentation.) Cicero reduces the rhetorical modes of reaſoning to two, which he calls *ratiocination* and *induction*, compriſing both ſyllogiſm and enthymeme under ratiocination, and example under induction; ſo that the difference lies in their manner of dividing them. As to the uſe of theſe modes of reaſoning, it is proper to vary them in a diſcourſe, and not to adhere too cloſely to the ſame form; for want of variety in this, as well as in other caſes, will ſoon create diſguſt. With regard to the diſpoſition of arguments, or the order of placing them, ſome adviſe to put the weaker, which cannot wholly be omitted, in the middle; and ſuch as are ſtronger, partly in the beginning, to gain the eſteem of the hearers, and render them more attentive; and partly at the end, becauſe what is laſt heard, is likely to be retained longeſt; and if there are but two arguments, to place the ſtronger firſt, and then the weaker; and after that to return again to the former, and inſiſt principally upon that. But this muſt be left to the prudence of the ſpeaker, and the nature of the ſubject. Nevertheleſs, it can never be proper to begin with the ſtrongeſt and ſo gradually deſcend to the weakeſt; for this would be a kind of anti-climax in reaſoning, which would be likely to deſtroy its effect. Arguments ought not to be crowded too cloſe upon one another; for then their force would be weakened, and the attention of the hearers would be ſo diſtracted, that they could not have ſufficient time duly to conſider them. Beſides, more arguments than are neceſſary ſhould not be uſed, becauſe the fewer they are, the more eaſily they are remembered. In this reſpect the obſervation of a great maſter of eloquence is very juſt, that "arguments ought rather to be weighed than numbered." Cic. de Orat. lib. ii. c. 76.

The confirmation is, as it were, the life and ſoul of the oration: in this the main ſtreſs of the argumentation lies. Whence Ariſtotle, properly enough, calls it πιστις, *fides.*

Confirmation of *Biſhops.* See Bishop.

Confirmation, in *Theology*, the ceremony of laying on of hands, for the conveyance of the Holy Ghoſt. When the apoſtles at Jeruſalem heard that many of the inhabitants of Samaria had embraced the Goſpel, and had been baptized, they ſent thither Peter and John, who laid their hands on theſe new converts, and prayed that they might receive the Holy Ghoſt, and the Holy Ghoſt deſcended upon them. (Acts, viii. 14, &c.) And when the men of Epheſus had been baptized, "Paul laid his hands upon them, and the Holy Ghoſt came upon them." (Acts, xix. 6.) And St. Paul, in his epiſtle to the Hebrews, (vi. 2.) mentions the doctrine of the laying on of hands immediately after the doctrine of baptiſm. Upon theſe authorities was founded the practice, which prevailed in the primitive church, of perſons receiving from the biſhop immediately after baptiſm, a ſolemn benediction, accompanied with impoſition of hands, unction upon the forehead with the holy chriſm (made of oil and balſam), the ſign of the Croſs, and a prayer for the deſcent of the Holy Ghoſt.

Among the ancients it was conferred immediately after baptiſm; and was eſteemed, in ſome meaſure, to be a part thereof: whence the fathers call it the *accompliſhment* of baptiſm. The ground of the practice was an opinion of the imperfection of baptiſm, which in their apprehenſion only prepared perſons for the reception of the graces of the Holy Spirit, which were actually conferred in confirmation. To this purpoſe Tertullian ſays, "when we come out of the water, we are anointed with a bleſſed ointment, according to that ancient rite by which men uſed to be anointed for the prieſt's office with oil out of a horn, ever ſince the time that Aaron was anointed by Moſes; ſo that Chriſt himſelf had his name from chriſm. (See Chrism.) Then we have the impoſition of hands on us, which calls down and invites the Holy Ghoſt." (Tertull. de Baptiſm. c. 7. King's Hiſt. of the Prim. Church, chap. v. p. 80, &c.) This ceremony was called confirmation, as it completed the admiſſion of the perſon into the Chriſtian church, and qualified him to partake of the Lord's Supper. It was not confined to adults, but infants alſo received confirmation as ſoon as they were baptized, and an opportunity offered of preſenting them to the biſhop.

Among the Greeks, and throughout the Eaſt, it ſtill accompanies baptiſm; but the Romaniſts make it a diſtinct independent ſacrament. The firſt expreſs inſtitution of this ceremony as a ſacrament occurs in the decree of pope Eugenius in 1439, in which he ſays, "the ſecond ſacrament is confirmation, the matter of which is chriſm bleſſed by the biſhop, and though the prieſt may give the other unction, the biſhop only can confer this." Peter Lombard, however, who lived in the 12th century, ſeems to have been the firſt who reckons ſeven ſacraments, and mentions confirmation as one of them. Although this ceremony was generally performed by biſhops, yet in ſome countries, and at ſome periods, it was performed by preſbyters; but in that caſe it was neceſſary that the chriſm ſhould have been previouſly conſecrated by the biſhop. St. Cyprian, and many of the fathers, ſpeak of it in ſuch terms as to imply, that the adminiſtration of it was confined to the biſhop alone. Jerome tells us, that in his time, confirmation was always performed in the Latin church by biſhops, as it had been in earlier times; and ſome have ſuppoſed that the cuſtom of receiving the impoſition of hands after baptiſm, to be performed by the biſhop alone, commenced in the time of this father; though he himſelf did not think that the Holy Spirit was given by the impoſition of the hands of the biſhop only: and he ſays, they are not to be lamented, who, being baptized by preſbyters or deacons in little villages, and caſtles, have died before they were viſited by biſhops. Hilary ſays, that in Egypt the preſbyters confirmed in the abſence of the biſhop: the ſame was alſo determined by the council of Orange; and this was the practice of the Greek church, which did not allow confirmation to be a ſacrament. From one of the canons of the council of Illiberis we learn, that, in the time of Cyprian and of Auguſtine, confirmation was performed by biſhops. Hence Fleury, and many of the moderns, lay it down as a diſtinguiſhing character between the offices of a prieſt or deacon, and that of a biſhop, that the former might baptize, but the latter alone might anoint and confirm; by virtue of their ſucceſſion to the apoſtles, to whom it originally belonged. But from ſome paſſages in St. Gregory, &c. others gather, that the prieſts, on occaſion, had likewiſe the power of confirming.

It has been alleged, that, as confirmation always ſucceeded baptiſm, and made a neceſſary part of it, and ſeveral of the primitive Chriſtians eſteemed both neceſſary to ſalvation, it muſt have been performed by preſbyters as well as by biſhops; becauſe the biſhop of a church might be abſent for a very conſiderable time, as was the caſe with Cyprian, or the ſee might be vacant: and as preſbyters baptized, it is reaſonable to conclude that they alſo confirmed. Lord King has ſhewn that confirmation and abſolution were the ſame thing; and that preſbyters, ſometimes with the biſhop, and ſometimes without the biſhop, did abſolve by impoſition of hands: and he has cited ſeveral ancient authorities in order to prove, that confirmation was frequently repeated with reſpect to the ſame perſons. (Hiſt. Prim. Church, p. 91, &c.)

It is certain, among the Greeks, the prieſt who baptizes, alſo confirms: which practice, Lucas Holſtenius ſhews, is of ſo old a ſtanding among them, that it is now generally looked on as belonging properly, and of right, to the prieſt: though ſome will have it to have been borrowed by them from the biſhops. Hence, ſome of the Latin divines acknowledge, that though the biſhop be the ordinary miniſter of confirmation, yet, that the prieſt, in his abſence, may alſo confer it, in quality of miniſter extraordinary.

The council of Rouen, held in 1072, decrees that confirmation muſt be conferred faſting, both on the ſide of the giver, and that of the receiver.

The ancients, and in this reſpect they are followed by the moderns, did not think this rite of confirmation ſo abſolutely neceſſary, that the want of it would exclude from the kingdom of heaven thoſe who had already been baptized; but they attributed to it ſo much importance, that they puniſhed the neglect of it with marks of diſgrace and public cenſure; and denied the privilege of eccleſiaſtical promotion and holy orders to ſuch perſons as had voluntarily and careleſsly omitted it.

"After this example of the primitive Chriſtians," ſays Dr. Tomline, the biſhop of Lincoln, "our church requires all who have been baptized to appear publicly in the congregation, and renew their baptiſmal vow according to the form preſcribed in our liturgy." The order of confirmation requires, "that none ſhall be confirmed but ſuch as can ſay the Creed, the Lord's Prayer, and the Ten Commandments, and can alſo anſwer to ſuch other queſtions as in the Short Catechiſm are contained, &c." The biſhop then queſtions them, whether they renew the ſolemn promiſe and vow that was made in their name at their baptiſm; ratifying and confirming the ſame in their own perſons, and acknowledging themſelves bound to believe and to do all thoſe things which their god-fathers and god-mothers then undertook for them? The biſhop in his general prayer declares before God that he hath vouchſafed to regenerate theſe his ſervants by water and the Holy Ghoſt, and hath given unto them forgiveneſs of all their ſins; and then laying his hand upon the head of every one ſeverally, offers a prayer for each individual. Moreover, in the collect which forms a part of this ſervice, he prays for thoſe that are confirmed, ſaying, "upon whom, (after the example of thy holy apoſtles), we have now laid our hands, to certify them (by this ſign) of thy favour and gracious goodneſs towards them." The order forbids any to be admitted to the holy communion, but thoſe who have been confirmed, or who are ready and deſirous to be confirmed. This order of confirmation does not mention the proper age of the perſon to be confirmed.

This ceremony, ſays the biſhop, "falls within the authority of the church, and may be conſidered as included in the general precept of doing all things "in order and unto edifying;" eſpecially ſince the now univerſal practice of infant baptiſm makes confirmation more neceſſary than it was in the primitive church, when chiefly adults were baptized. It ſeems highly reaſonable that they, who, at the time of their baptiſm, were incapable of making any engagement, ſhould, when they arrive at a proper age, ratify and confirm thoſe promiſes which were made in their name. And to give this ordinance the greater ſolemnity, it is performed only by the higher orders of the church, the archbiſhops and biſhops. Thus far our church receives confirmation, confining it to prayer and impoſition of hands, without the chriſm, or the ſign of the croſs, and believes it to be derived from the practice of the apoſtles. But as it is not a regular conſtitution of Chriſt and his apoſtles, like baptiſm and the Lord's ſupper, with a written command that it ſhould be continued in future ages, and a promiſe that it will be attended with inward grace, we reject it as a ſacrament. There is, indeed, not a ſingle precept upon the ſubject in the New Teſtament; nor is there any ſcriptural authority for the uſe of the chriſm or the ſign of the croſs; and Bingham thinks that the chriſm made no part of confirmation before the latter end of the ſecond century; though other writers attribute an earlier date to it. It muſt be admitted by all, that impoſition of hands was not peculiar to confirmation (ſee Matt. xix. 13. Mark, x. 16. Luke, iv. 40); and that no ſeparate efficacy is aſcribed to it diſtinct from the prayers which accompanied it; and prayer and impoſition of hands are not ſufficient to conſtitute a ſacrament: we, therefore, conſider confirmation as nothing more than a ſolemn manner of perſons' taking upon themſelves their baptiſmal vow; and as ſuch, it is a ceremony of high importance, calculated to impreſs youthful minds with a juſt ſenſe of the great obligations of the Chriſtian profeſſion, and to excite in them an earneſt endeavour "faithfully to obſerve ſuch things as they, by their own confeſſion, have aſſented unto." Elements of Chriſtian Theology, vol. ii. p. 416.

It has been urged, however, that this ceremony, with reſpect to the real importance and utility of it, was peculiar to the days of the apoſtles: and though it is retained among Proteſtants, it is doubted whether it be a neceſſary inſtrument of grace.

Some have thought it a remnant of the popiſh ſacrament of confirmation; and that there is no more authority for retaining this remnant, than for any thing that is omitted in the ceremony. It has been ſaid that the texts of ſcripture, repeatedly alleged in favour of this rite, have no weight. To this purpoſe it has been argued, that Peter's and John's going down to Samaria to pray, and to lay their hands on thoſe whom Philip had baptized, furniſhes no precedent, no direction, no inſtitution, nor command, for our biſhops, to do likewiſe. The end for which the apoſtles did it, as it is expreſsly ſaid (Acts, viii. 15. 17.), was, "that they might receive the Holy Ghoſt," *i. e.* its miraculous gifts, ſuch as propheſying, ſpeaking with tongues, &c. neceſſary for forming them into a church; in proof of which it is urged, that they were ſomething viſible and obvious to ſenſe; ſomething which excited the wonder and ambition of the wicked ſorcerer; for it is ſaid, "When Simon ſaw that through laying on of the apoſtles' hands the Holy Ghoſt was given, he offered them money." Beſides, Dr. Whitby has obſerved, that if they laid not their hands on *all* who were baptized, it makes nothing for confirmation; if they did, then Simon Magus alſo was confirmed, and received the Holy Ghoſt; which is not admiſſible. Our biſhops, it has been ſaid, diſclaim the powers exerciſed by the apoſtles. As for the open and ſolemn renewal of the baptiſmal covenant before God, which baptized perſons ought to make, when they come to years of diſcretion, this, it is ſaid, is done in the ſacrament of the Lord's ſupper, which Chriſt himſelf has appointed, and which is the *only* inſtitution his wiſdom has thought fit to appoint for this purpoſe. It has alſo been alleged that the ceremony of confirmation, however ſolemnly practiſed, has a tendency, the more from the ſolemnity of its adminiſtration, to cheriſh in men's minds a preſumptuous and falſe hope, and to delude them into wrong notions as to the ſafety of their ſtate, and as to the terms of acceptance and favour with God. What warrant, it has been aſked, has the biſhop to pronounce a man's "ſins all forgiven," and himſelf "regenerated by the Holy Ghoſt," upon no other grounds than his being able to repeat the Lord's Prayer, Creed, and Ten Commandments, and the anſwers of the Short Catechiſm? Can it be ſaid, that this is the Chriſtian doctrine concerning the terms of acceptance and favour with God? Are good vows and reſolutions, declared in the church, infallible or proper proofs of a regeneration by the Holy Ghoſt? Is a man's profeſſing that he repents, and promiſing that he will live a godly life, that actual repentance and amendment of life, which *alone* can enſure the divine pardon and favour? The multitudes, it is further ſaid, who come to be confirmed, are taught to conſider the biſhop, in the exerciſe of that part of his office, as an ambaſſador of Chriſt, a ſucceſſor of the apoſtles, and a ſpecial miniſter of God; and therefore, when they hear this ſacred perſon, ſolemnly declaring that they are fully juſtified, pardoned, and regenerated by the Holy Ghoſt, can they be blamed if they believe it, and reſt ſatiſfied with regard to the ſafety and happineſs of their ſtate? And as full remiſſion of ſins, and the favour of God are to be had on ſuch eaſy terms, is it matter of wonder, that thouſands ſhould eagerly flock from all quarters to accept it? Or that perſons of very vile and profligate characters ſhould too often thruſt themſelves in to partake of this benefit, and be ſeen receiving upon their knees epiſcopal abſolution, and ſolemn aſſurances of God's favour and peace?

It has been further argued by thoſe who object to the continued practice of this ceremony of confirmation in the Chriſtian church, that Tertullian is the moſt ancient author who has mentioned it, and that in his time, a great variety of ſuperſtitions, and ridiculous and fooliſh rites, had been introduced and actually ſubſiſted in the Chriſtian church. Confirmation was then always performed, as we have already mentioned, (not as it is with us, but) immediately after baptiſm. The expreſſion in our order of confirmation, by which the biſhop declares to God, "that he hath vouchſafed to regenerate theſe his ſervants by water and the Holy Ghoſt, and to give them the forgiveneſs of all their ſins," was probably taken from ſome ancient liturgy, and was ſuitable and well adapted to the practice of thoſe times, but is incongruous and unſuitable to ours. Then, as Dr. Cave obſerves, (Primitive Chriſtianity, pt. 1. p. 194, 208.) "although infants were undoubtedly taken into the church by baptiſm, yet the main body of the baptized were adult perſons; who, flocking over daily in great numbers to the faith of Chriſt, were received in at this door. Uſually they were for ſome conſiderable time catechized, and trained up in the principles of the Chriſtian faith; till having given teſtimony of their proficiency in knowledge, and of a ſober and regular converſation, they became candidates for baptiſm," or, as lord King ſays, (Inquiry into the Conſtitution, &c. pt. i. p. 102.) "the catechumens enjoyed not the privileges of the faithful, till they had, in a ſenſe, merited them, which was when, through a conſiderable time of trial, they had evidenced the ſincerity of their hearts, by the ſanctity and purity of their lives. And then, as Origen ſays, *we initiate them in our myſteries, when they have made a proficiency in holineſs, and according to the utmoſt of their power have reformed their converſation.* When they had changed their manners, and rectified their irregular carriage, then they were waſhed with the *water of baptiſm, and* NOT BEFORE. For, as Tertullian obſerves, we are not baptized *that we may ceaſe to ſin*; but *becauſe we have already ceaſed.*" In theſe circumſtances, it is ſaid, the biſhop or the preſbyter might uſe an expreſſion ſimilar to that already cited with propriety; but the caſe is different, ſay the objectors to the permanent uſe of this rite, with the multitudes who flock to modern confirmations. Pierce's Vindiciæ Frat. Diſſ. Towgood's Diſſent juſtified.

CONFISCATE, in *Law*, is applied to goods forfeited to the exchequer, or public treaſury.

The word is derived from *fiſcus, a hamper, panier*, or *baſket*, wherein the emperor's money uſed to be kept.

The title to goods, which are not claimed by any other, is given by law to the king. If a man, indicted for ſtealing the goods of another, in which caſe they become, in effect, the proper goods of him indicted, be aſked about them in court, and diſclaim them; he thereby loſes the goods, though he be afterwards acquitted of the theft; and the king ſhall have them as confiſcate; but otherwiſe, if he had not diſclaimed them. Thus alſo, when goods are found in the poſſeſſion of a felon, if he diſavows them and afterwards is attainted for other goods, and not for them, the goods which he diſavows are confiſcate to the king; but if he had been attainted for the ſame goods, they would have been ſaid to be "forfeited and not confiſcated." So if an appeal of robbery be brought, and the plaintiff leaves out ſome of his goods, he ſhall not be allowed to enlarge his appeal; and becauſe there is none to receive the goods ſo left out, the king ſhall have them as confiſcate, according to the rule, "Quod non capit chriſtus, capit fiſcus." Staundf. P. C. l. 3. c. 24. See Forfeiture.

CONFISCATION, a legal adjudication of goods or effects to the fiſc, or treaſury.

Thus, the bodies and effects of criminals, traitors, &c. and merchandizes that are contraband, prohibited, or brought aboard or aſhore, without paying the duties, when ſeized, are confiſcated.

It is an axiom in law, that he who confiſcates the body, confiſcates alſo the effects, to the profit of the king, or the lord of the fee, *i. e.* he who is condemned to loſe his life, muſt alſo loſe his goods; yet the widows of criminals do not loſe their dowries, nor their ſhare in the goods of the community, by the forfeiture of their huſbands. See Forfeiture.

CONFLAGRATION, a general burning of a city, or other conſiderable place. In which ſenſe, Nero is ſaid to have procured the Chriſtians to be accuſed of the conflagration of Rome, which was done by his own order.

But the word is more ordinarily reſtrained to that grand period, or cataſtrophe of our world, wherein the face of nature is expected to be changed by a deluge of fire, as it was anciently by that of water. The ancient Chaldæans, Pythagoreans, Platoniſts, Epicureans, Stoics, Celts, and Etrurians, appear to have had a notion of the conflagration; though whence they ſhould derive it, unleſs from the ſacred books, it is difficult to conceive; except perhaps, from the Phœnicians, who themſelves had it from the Jews.

The Celts, whoſe opinions reſembled thoſe of the eaſtern nations, held, that after the burning of the world, a new period of exiſtence would commence. The ancient Etrurians, or Tuſcans, alſo concurred with other weſtern and northern nations of Celtic origin, as well as with the Stoics, in aſſerting the entire renovation of nature after a long period, or great year, when a ſimilar ſucceſſion of events would again take place. The coſmogony of an ancient Etrurian, preſerved by Suidas, limits the duration of the univerſe to a period of 12,000 years, 6000 of which paſſed in the production of the viſible world, before the formation of man. The Stoics alſo maintained, that the world is liable to deſtruction from the prevalence of moiſture, or of drought; the former producing an univerſal inundation, and the latter an univerſal conflagration. Theſe, they ſay, ſucceed each other in nature, as regularly as winter and ſummer. When the univerſal inundation takes place, the whole ſurface of the earth is covered with water, and all animal life is deſtroyed; after which nature is renewed, and ſubſiſts as before, till the element of fire, prevailing in its turn, dries up all the moiſture, converts every ſubſtance into its own nature, and at laſt, by an univerſal conflagration, reduces the world to its priſtine ſtate. At this period all material forms are loſt in one chaotic maſs, all animated nature is reunited to the Deity, and nature again exiſts in its original form, as one whole, conſiſting of God and matter. From this chaotic ſtate, however, it again emerges, by the energy of the efficient principle; and gods and men, and all the forms of regulated nature are renewed, to be diſſolved and renewed in endleſs ſucceſſion. The doctrine of conflagration is a natural conſequence of the general ſyſtem of Stoiciſm. For, ſince, according to this ſyſtem, the whole proceſs of nature is carried on in a neceſſary ſeries of cauſes and effects, when that operative fire which at firſt, burſting from chaos, gave form to all things, and which has ſince pervaded and animated all nature, ſhall have conſumed its nutriment, that is, when the vapours, which are the food of the celeſtial fires, ſhall be exhauſted, a deficiency of moiſture muſt produce an univerſal conflagration. This grand revolution in nature is, after the doctrine of the Stoics, thus elegantly deſcribed by Ovid, (Metam. l. i. v. 256):

"Eſſe quoque in fatis reminiſcitur affore tempus
Quo mare, quo tellus, correptaque regio cœli
Ardeat, et mundi moles operoſa laboret:"

or, as Dryden has tranſlated the paſſage,

"Rememb'ring in the fates a time when fire
Should to the battlements of heaven aſpire,
When all his blazing worlds above ſhould burn,
And all th' inferior globe to cinders turn."

Seneca, ſpeaking of the ſame event, (Ad Murciam, c. ult.) ſays expreſsly, "Tempus advenerit quo ſidera ſideribus incurrent, et omni flagrante materia uno igne, quicquid nunc ex depoſito lucet, ardebit," &c. *i. e.* the time will come when the world will be conſumed, that it may be again renewed, when the powers of nature will be turned againſt herſelf; when ſtars will ruſh upon ſtars, and the whole material world, which now appears reſplendent with beauty and harmony, will be deſtroyed in one general conflagration. In this grand cataſtrophe of nature, all animated beings (excepting the univerſal intelligence), men, heroes, demons, and gods, ſhall periſh together. Seneca, the tragedian, who was of the ſame ſchool with the philoſopher, writes to the ſame purpoſe, (Herc. Oct. iii. 1112.)

"Cœli regia concidens
Ortus atque obitus trahet,
Atque omnes pariter deos
Perdet mors aliqua, et chaos."

i. e. "The mighty palace of the ſky,
In ruin fall'n is doom'd to lie,
And all the gods, its wreck beneath,
Shall ſink in chaos and in death."

During the courſe of this vaſt conflagration, the Stoics conceived that the world would expand, and in its chaotic ſtate continue to fill a much larger portion of infinite ſpace than it had required, or would again require, in a ſtate of orderly arrangement. After an interval of reſt, ſays Seneca, (Epiſt. 9. Qu. Nat. c. ult.) in which the Deity will be intent upon his own conceptions, the world will be entirely renewed; every animal will be reproduced; and a race of men, free from guilt, and born under happier ſtars, will repeople the earth. Degeneracy and corruption, will, however, again creep into the world; for it is only while the human race is young, that innocence remains upon the earth. The grand courſe of things, from the birth to the deſtruction of the world, which, according to the Stoics, is to be repeated in endleſs ſucceſſion, is accompliſhed within a certain period. This period, or fated round of nature, is probably what the ancients meant by the "Great Year."

From this brief account of the doctrine of the Stoics concerning the final conflagration, it evidently appears, that it differs in ſeveral eſſential particulars from the Chriſtian doctrine on this head. It is the work of fate, performed by natural and mechanical laws, and repeated eternally at certain periods, without any good reaſon, ſince with every revolution the ſame diſorders and vices return. Philo juſtly ridicules this dogma; remarking, that the Stoics make their deities act like children, who raiſe up piles of ſand only for the pleaſure of beating them down. Several of the Stoics themſelves were aware of the abſurdity of this ſyſtem, and rejected it; particularly Boethius, Poſidonius, Diogenes the Babylonian, and Pauætius. This general diſſolution the Stoics call εκπυρωσις, *ecpyroſis*. The Pythagoreans alſo maintained the dogma of conflagration. To this purpoſe Hippaſus, of Metapontum, taught that the univerſe is finite, is always changing, and undergoes a periodical conflagration. Philolaus, who flouriſhed in the time of Plato, maintained that the world is liable to deſtruction, both by fire and water.

Mention of the conflagration is alſo ſeveral times made in the books of the Sibyls, Sophocles, Hyſtaſpes, Lucan, &c.

Dr. Burnet, after F. Tachard, and others, relates, that the Siameſe believe, that the earth will at laſt be parched up with heat; the mountains melted down; and the earth's whole ſurface reduced to a level, and then conſumed with fire. And the Bramins of Siam do not only hold, that the world ſhall be deſtroyed by fire; but, alſo, that a new earth ſhall be made out of the cinders of the old.

The ſacred ſcriptures announce this event in a variety of paſſages; ſome of which, however, have been applied by Dr. Hammond, and others, to the deſtruction of Jeruſalem; but others are univerſally allowed to refer to this awful cataſtrophe. See 2 Pet. iii. 10—13, referred by Dr. Hammond to the deſtruction of Jeruſalem, and the diſſolution of the Jewiſh ſtate, but generally, and, with juſt reaſon, applied to the end of the world. (See Ray's Diſcourſes, p. 311, &c.) 2 Theſſ. i. 7, 8. Rev. vi. 12, 13, 14. Rev. x. 6. Rev. xxi. 1. Heb. xii. 26, 27. All theſe paſſages, and others, which more immediately relate to the time of this event, are applied by Dr. Hammond to the deſtruction of the city, temple, and polity of the Jews: and, indeed, he leaves only one place in the New Teſtament, as a proof of the general conflagration of the world; *viz.* 2 Pet. vii. 7. Other paſſages have been cited from the Old Teſtament that ſeem to indicate and foretel the diſſolution of the preſent globe: ſuch are Job. xiv. 12. Pſ. cii. 5, 6. Iſai. li. 6. Joel, ii. 31. Malachi, iv. 1. Deut. xxxii. 12. But it muſt be allowed that the prophetic books abound with figurative expreſſions, the preciſe object of which cannot be ſo ſatisfactorily aſcertained. The ancient fathers of the church, and Chriſtian writers, in ſucceſſive periods of its duration, have frequently referred to this event, and teſtified their belief of its advent. Some of the firſt Chriſtians apprehended it to be near at hand; and many of the ancients conceived that it would take place at the end of 6000 years. In this number we may claſs Juſtin Martyr, Irenæus, Lactantius, Euſtathius, &c.; but their opinion, with regard to the preciſe time of this event, is propoſed by them not as an undoubted truth, but only as a modeſt conjecture. It was the general opinion of the ancient Chriſtians, that this world ſhall not be annihilated or deſtroyed, but merely renewed and purified. To this purpoſe we might cite the teſtimonies of Euſebius, Cyril, Oecumenius, Jerome, and others.

Various are the ſentiments of authors on the ſubject of the conflagration; the cauſe whence it is to ariſe, and the effects it is to produce. Divines ordinarily account for it metaphyſically; and will have it take its riſe from a miracle, as a fire from heaven. Philoſophers contend for its being produced from natural cauſes; and will have it effected according to the laws of mechanics: ſome think an eruption of a central fire ſufficient for the purpoſe; and add, that this may be occaſioned ſeveral ways; *viz.* either by having its intenſity increaſed; which, again, may be effected either by being driven into leſs ſpace by the encroachments of the ſuperficial cold, or by an increaſe of the inflammability of the fuel whereon it is fed: or by having the reſiſtance of impriſoning earth weakened; which may happen, either from the diminution of its matter, by the conſumption of its central parts; or by weakening the coheſion of the conſtituent parts of the maſs, by the exceſs or the defect of moiſture.

Others look for the cauſe of the conflagration in the atmoſphere; and ſuppoſe, that ſome of the meteors there engendered in unuſual quantities, and exploded with unuſual vehemence, from the concurrency of various circumſtances, may be made to effect it, without ſeeking any further.

The aſtrologers account for it from a conjunction of all the planets in the ſign Cancer; as the deluge, ſay they, was occaſioned by their conjunction in Capricorn. This was an opinion adopted by the ancient Chaldæans.

Laſtly: others have recourſe to a ſtill more effectual and flaming machine; and conclude the world is to undergo its conflagration from the near approach of a comet, in its return from the ſun. Thoſe wandering bodies do indeed ſeem to menace us a little; being able, both by their tranſverſe motion acroſs the earth's way, by the hugeneſs of their ſize, and the intenſe fire wherewith they glow in their receſs from the perihelion, to produce the moſt ſignal changes and revolutions in the ſyſtem of things.

Mr. Whiſton has ſhewn, that they are extremely well fitted to produce the phenomena of the deluge; and has gone a good way towards proving, that the comet of 1680, was the very body to which that event was owing; as being then in its approach towards the ſun, and its atmoſphere crowded with the watery vapours, which it had gathered in thoſe inconceivably cold regions, into which it had fled off in its aphelion.

This ſame comet, ſir Iſaac Newton has calculated, when in its perihelion, December the 8th, was heated, by the vicinity of the ſun, to a degree two thouſand times more hot than red-hot iron: he ſhews, likewiſe, that it would ſcarce be cool again in fifty thouſand years.

This ſame comet, Dr. Halley obſerved November the 11th, was not above a ſemidiameter of the earth from the earth's way: ſo that had the earth, at that time, been in that part of its orbit, ſomething very extraordinary might have been apprehended; but whether in the way of fire, or water, may, perhaps, to ſome, leave room to doubt. But it is ſcarcely conceivable, that the comet ſhould bring any vehement degree of heat, out of thoſe regions it comes from, whatever heat it might carry thither. See COMET. See on the ſubject of this article *Theory of the* EARTH.

CONFLANS, in *Geography*, a ſmall town of France, in the department of Mont-blanc, and chief place of a canton in the diſtrict of Moutiers, 18 miles N.E. from Moutiers. The place contains 1313, and the canton 5512 inhabitants: the territory includes 182½ kiliometres and 10 communes.—Alſo, a ſmall town of France, in the department of Moſelle, and chief place of a canton in the diſtrict of Briey, ſituated at the confluence of the Iron and Orn, 15 miles E. from Metz. This place contains but 347, and the canton 7145 inhabitants, and 31 communes, upon a territorial extent of 240 kiliometres.—Alſo, a town of France, in the department of the Upper Saone, in the diſtrict of Lure; 4 leagues N. of Veſoul, and 2½ W. of Luxeuil.—Alſo, a town of Savoy, near the conflux of the Iſere and Doron; 18 miles E. of Chambery.

CONFLANS, or *Conflaut*, was, before the revolution, the name of a valley of France, in Rouſillon, ſurrounded by the Pyrenées, and watered by the river Tet. Villefranche ſur le Tet was its capital.

Conflans *St. Honorine*, a town of France, in the department of the Seine and Oiſe; 5 leagues S.W. of Paris.

CONFLICT. See Combat.

CONFLUENCE, Conflux, the place where two rivers join, and mix their waters.

CONFLUENT, in *Medicine*, literally *flowing together*, is a term applied to cutaneous eruptions, which, though conſiſting, on their firſt appearance, of ſeparate and diſtinct ſpots, form themſelves ſubſequently into extenſive patches, by the ſpreading of the individual ſpots, which coaleſce with each other. This epithet is moſt frequently applied to the ſmall pox, which, when confluent, becomes a very formidable and fatal diſeaſe, and requires a treatment in its latter ſtages, different from that which is beneficial in the mild form of the diſeaſe, when the puſtules are few and diſtinct. See Small-Pox.

CONFLUENTA, in *Ancient Geography*, a town of Spain, belonging to the Vaccæans, S.E. of Pallentia.

CONFLUENTES. See Coblentz.

CONFOLENS, in *Geography*, a town of France, in the department of Charente, and chief place of a diſtrict, ſituated on the river Vienne, 30 miles N.W. from Limoges, and 36 N.E. from Angoulême. It has a ſub-prefect, a court of juſtice, and a regiſter-office. It is divided into north and ſouth, and has a population of 2025 inhabitants. Its northern canton compriſes 7391, and the ſouthern 11,385 inhabitants, diſtributed in 18 communes, upon a territorial extent of 342½ kiliometres. The diſtrict reckons 58,503 inhabitants and 70 communes, on a territorial extent of 1432½ kiliometres. Its ſoil in general is a barren heath, except on the banks of the Vienne, which afford ſome good corn land and excellent paſtures. Corn and cattle are the principal articles of commerce. N. lat. 46° 2′. E. long. 0° 34′.

CONFORMATION, the particular texture and conſiſtence of the parts of any body, and their diſpoſition to make a whole.

We ſay, light of different colours is reflected from bodies, according to their different conformation; in oppoſition to the Carteſians, who pretend, that reflected light becomes of different colours, according to the different conformation of the bodies that reflect it. The conformation of the members of an embryo is not perfect enough to allow of diſſection.

CONFORMITY, in the *Schools*, is the congruency, or relation of agreement between one thing and another: as between the meaſure, and the thing meaſured: the object, and the underſtanding; the thing, and the conception; the thing, and the diviſion thereof, &c.

Conformity, *Non.* See Non-conformity.

Conformity, *Occaſional.* See Occasional Conformity.

CONFRERES, from *con*, and *frere*, *brother*; denote brethren in a religious houſe, or the fellows of one and the ſame ſociety. 32 Hen. VIII. c. 24.

CONFRONTATION, the act of bringing two perſons, in preſence of each other, to diſcover the truth of ſome fact, which they relate differently.

The word is chiefly uſed in criminal matters; where the witneſſes are confronted with the accuſed; the accuſed with one another, or the witneſſes with one another.

CONFUCIUS, or Kong-fu-tse, in *Biography*, the moſt celebrated ancient philoſopher of China, deſcended from the imperial family of the dynaſty of Shang, was born in the reign of the emperor Lu, about four centuries and a half before Chriſt. He was accordingly a contemporary with Pythagoras, and flouriſhed at a period prior to that in which Socrates roſe to celebrity. At fifteen years of age, he engaged in the ſtudy of the ancient learning of his country; and, before he had arrived at the years of manhood, he had made aſtoniſhing proficiency in the doctrines attributed to the legiſlators Yao and Chun, which the Chineſe conſider as the ſource of all their ſcience and morality. The reputation which Confucius acquired, and the uncommon wiſdom which he diſcovered, were the means of advancing him, while he was yet but a youth, to the office of miniſter of ſtate. The duties of this, and of other poſts aſſigned to him, he performed with honour to himſelf, and ſignal benefit to the kingdom. The rank which he held in public life, enabled him to form an accurate judgment of the ſtate of morals among his countrymen. He deviſed a plan for a general reformation, which he endeavoured to carry into execution, as well by inculcating a ſtrict and pure morality, as by uſing the influence of his authority in recommending it. His efforts were crowned with ſo much ſucceſs, that the whole nation became, at firſt, a pattern of order, decorum, and ſtrict juſtice. This reformation was not, however, permanent; the buſineſs of the ſtate was abandoned to men of licentious habits, and in a ſhort time an univerſal effeminacy and diſſoluteneſs of manners prevailed. Confucius exerted all his powers to ſtem the torrent of vice; and when he found that his endeavours were fruitleſs, he reſolved to quit his ſtation and country, and ſeek an aſylum in ſome other kingdom where his efforts in the cauſe of virtue might be more availing. He, at length, devoted himſelf to the taſk of private inſtruction in philoſophy and morality. His great celebrity, and his perſonal virtues, ſoon procured him many ſcholars; and he is ſaid to have had ſeveral thouſand diſciples to whom he taught morals, the art of reaſoning, and the principles of policy. From theſe he ſelected ſeventy-two, who were diſtinguiſhed from the others on account of their ſuperior attainments. Theſe were divided into claſſes, deſtined for different purpoſes. The buſineſs of the firſt claſs was the ſtudy of morals; of the ſecond, that of reaſoning and eloquence; of the third, that of the rules of good government; and the immediate province of the fourth was ſomething ſimilar to our public preaching. The exertions of Confucius in the cauſe of virtue, were too great for the frame of body with which he was endued; his natural ſtrength became impaired, and his mental powers failed. During his laſt ſickneſs, he declared that his heart was overpowered with grief, on beholding the diſorders which prevailed in the empire, and which he had in vain endeavoured to ſuppreſs: "The kings," ſaid he, "will not follow my maxims; I am no longer uſeful on earth; it is, therefore, time that I quit it." This exclamation was followed by a lethargy from which he never recovered. He died in his ſeventy-third year. B. C. about 479, (Blair.) By his ſage counſels, his moral doctrine, and his exemplary conduct, he obtained an immortal name as a reformer of his country After his death, his name was held in the higheſt veneration, and his doctrine is ſtill regarded among the Chineſe, as the baſis of all moral and political wiſdom. His natural temper was excellent, and his conduct irreproachable and exemplary. He was particularly praiſed for his humility, ſincerity, temperance, diſintereſtedneſs, and contempt of riches.

Confucius ſeemed deſigned by heaven to reform, both by his doctrines and example, the corruptions which prevailed, as well in the civil, as in the religious eſtabliſhments of China. He condemned the idolatry which he found exiſting among his countrymen, and endeavoured to introduce a purer form of religion. He did not attempt to dive into the impenetrable ſecrets of nature, nor bewilder himſelf in abſtruſe reſearches on the eſſence of a firſt cauſe, the origin of good and evil, and other ſubjects which ſeem beyond the limits of the human mind. He maintained that the Deity was the moſt pure and perfect principle, and fountain of all things; that he is independent and almighty, and watches over the government of the univerſe, ſo that no event can happen but by his command; that our moſt ſecret thoughts are open to his view; that he is holy without partiality, and of ſuch boundleſs goodneſs and juſtice, that he cannot poſſibly permit virtue to go unrewarded, or vice unpuniſhed.

So high is the reſpect paid to the memory of this great man, even in the preſent day, that his deſcendants enjoy, by inheritance, the title and office of mandarins, and are allowed the privilege in common with the princes of the blood, of exemption from the payment of all taxes to the emperor. The works which Confucius compoſed for the uſe of his diſciples, and the preſervation of his philoſophy, are looked upon by the Chineſe as of the firſt authority, next to the claſſical books, ſtyled by way of eminence, "the Five Volumes;" and to theſe, indeed, he declares himſelf indebted for the information and wiſdom which his own are calculated to convey. Moreri. Hiſt. Univer. D'Anquetil. Enfield's Hiſt. of Philoſophy.

CONFUSED *Notion* and *Viſion*. See the ſubſtantives.

CONFUSION, in a general ſenſe, is oppoſed to order; in a perturbation whereof, confuſion conſiſts: *e. gr.* when things prior in nature do not precede; or poſterior do not follow, &c.

In a logical ſenſe, confuſion is oppoſed to diſtinctneſs, or perſpicuity; and may happen, either in words, as when miſconſtrued or miſapplied; or in ideas, as when the idea of any thing preſents ſomething along with it, which does not properly belong to that thing.

In a phyſical ſenſe, confuſion is a ſort of union, or mixture by mere contiguity. Such is that between fluids of contrary natures; as oil and vinegar, &c.

CONFUSION, *property by*, in *Law*, denotes the intermixture of the goods of two perſons in ſuch a manner, that their reſpective portions cannot be aſcertained. If this be by conſent, they have a common intereſt, both by the Engliſh and civil law, in proportion to their ſhares. But, if one wilfully intermixes his money, corn, or hay, with that of another perſon, without his approbation or knowledge, or caſts gold in like manner into another's pot or crucible, the civil law, though it gives the ſole property of the whole to him who has not interfered in the mixture, yet allows a ſatisfaction to the other for what he has ſo improvidently loſt. (Inſt. 2. 1, 28). But our law, to guard againſt fraud, gives the entire property, without any account, to him, whoſe original dominion is invaded, and endeavoured to be rendered uncertain, without his own conſent. Poph. 38. 2 Bulſtr. 325. 1 Hal. P. C. 513. 2 Vern. 516. Bl. Comm. ii. 405.

CONFUSION *of tongues*, in the *Hiſtory of the World*, is a memorable event, which happened in the one hundred and firſt year, according to the Hebrew chronology, after the flood, B. C. 2247, at the overthrow of Babel; and which was providentially brought about, in order to facilitate the diſperſion of mankind, and the population of the earth. Until this period, there had been one common language, which formed a bond of union, that prevented the ſeparation of mankind into diſtinct nations; and ſome have ſuppoſed, that the tower of Babel was erected as a kind of fortreſs, by which the people intended to defend themſelves againſt that ſeparation, which Noah had projected.

There has been a conſiderable difference of opinion, as to the nature of this confuſion, and the manner in which it was effected. Some learned men, prepoſſeſſed with the notion that all the different idioms now in the world did at firſt ariſe from one original language, to which they may be reduced, and that the variety among them is no more than muſt naturally have happened in a long courſe of time by the mere ſeparation of the builders of Babel, have maintained, that there were no new languages formed at the confuſion; but that this event was accompliſhed by creating a miſunderſtanding and variance among the builders, without any immediate influence on their language. But this opinion, advanced by Le Clerc, &c. ſeems to be directly contrary to the obvious meaning of the word שפה, *ſhapha, lip*, uſed by the ſacred hiſtorian; which, in other parts of ſcripture, ſignifies *ſpeech*. (See Pſ. lxxxi. 5. Iſ. xxviii. 11. xxxiii. 19. Ezek. iii. 5.) It has been juſtly remarked, that unanimity of ſentiment, and identity of language, are particularly diſtinguiſhed from each other in the hiſtory; "the people is one, and they have all one language." (Gen. xi. 6.) It has been alſo ſuggeſted, that if diſagreement in opinion and counſel were the whole that was intended, it would have had a contrary effect; they would not have deſiſted from their project, but ſtrenuouſly have maintained their reſpective opinions, till the greater number of them had compelled the minority either to fly or to ſubmit. Others have imagined, that this was brought about by a temporary confuſion of their ſpeech, or rather of their apprehenſions, cauſing them, whilſt they continued together and ſpoke the ſame language, to underſtand the words differently: Scaliger is of this opinion. Others again account for this event, by the privation of all language, and by ſuppoſing that mankind were under a neceſſity of aſſociating together, and of impoſing new names on things by common conſent. Another opinion aſcribes the confuſion to ſuch an indiſtinct remembrance of the original language which they ſpoke before, as made them ſpeak it very differently; ſo that by the various inflections, terminations, and pronunciations of divers dialects, they could no more underſtand one another, than they who underſtand Latin can underſtand thoſe who ſpeak French, Italian, or Spaniſh, though all theſe languages ariſe out of it. This opinion is adopted by Cauſabon, and by biſhop Patrick in his Commentary in loc. and is certainly much more probable than either of the former: and Mr. Shuckford maintains, that the confuſion aroſe from ſmall beginnings, by the invention of new words in either of the three families of Shem, Ham, and Japhet, which might contribute to ſeparate them from one another; and that in each family new differences of ſpeech might gradually ariſe, ſo that each of theſe families went on to divide and ſubdivide among themſelves. Others, again, as Mr. Joſ. Mede and Dr. Wotton, &c. not ſatiſfied with either of the foregoing methods of accounting for the diverſity of languages among mankind, have recourſe to an extraordinary interpoſition of divine power, by which new languages were framed and communicated to different families by a ſupernatural infuſion or inſpiration; which languages have been the roots and originals from which the ſeveral dialects that are, or have been, or will be ſpoken, as long as this earth ſhall laſt, have ariſen, and to which they may with eaſe be reduced. This opinion is adopted and vindicated by Dr. Hartley, in his "Obſervations on Man," p. 179, who ſays, that it ſeems impoſſible to explain how the human languages ſhould ariſe from one ſtock. Upon the whole, we may obſerve, that there evidently ſeems to have been ſomething miraculous in the tranſaction; and if it be ſuppoſed that nothing more was meant than a confuſion of deſigns, counſels, and opinions; ſo that they could not agree together in the execution of their ſcheme (which, as we have ſhewn, is not very probable); this would be ſufficient to anſwer the purpoſe of Divine Providence, which was to prevent the children of Noah from preſerving their union in one body, and to ſpread them over the face of the earth, that it might be peopled and cultivated. If the confuſion of tongues was an actual change of languages, it was probably accompliſhed by degrees; nor does it appear to be ſo fundamental and radical an alteration as ſome have imagined. In proof of this, we may allege the free intercourſe which ſubſiſted in early times between perſons of different ages and countries; the uniformity of the Eaſtern languages, which plainly ſhews that they have one common radix; and the manifeſt derivation of the Greek and Latin from the ſame ſource.

As to the number of languages thus introduced, many opinions have been adopted. If there were no more than there were nations or heads of nations, then the number would be ſeven for Japhet, four for Ham, and five for Shem; but if there were as many as there were families, which is the more probable opinion, their number cannot be certainly aſſigned. However, the Hebrews fancy they were ſeventy, becauſe the deſcendants from the ſons of Noah, enumerated Geneſis x., were juſt ſo many. Allowing then the languages of the chief families to have been fundamentally different from each other, the ſub-languages and dialects within each branch would probably have had a mutual affinity, greater or leſs, as they ſettled nearer or farther from each other. But whichſoever of theſe hypotheſes is adopted, the primary object of the confuſion at Babel was the ſeparation and diſperſion of mankind. Cleric. Com. in Gen. x. i. Scaliger Exerc. in Cardan. § i. Caſaubon. Diatrib. de Ling. Heb. Mede's Works, vol. i. p. 276. Wotton's Diſc. and Brett's Eſſ. on the Confuſion of Languages. Univerſ. Hiſt. vol. i. part i. chap. 2. § 5. Shuckf. Conn. vol. i. p. 146.

The ingenious and learned Dr. Bryant has, in the third volume of his "Analyſis of Ancient Mythology," advanced a new and ſingular hypotheſis, both with reſpect to the confuſion of tongues and the diſperſion. He ſuppoſes that the confuſion of language was local and partial, and limited to Babel only. By כל־הארץ, Gen. xi. 1 and 8, which our tranſlators render the *whole earth*, he underſtands *every region:* and by the ſame words in ver. 9, the *whole region*, or province. This confuſion was occaſioned, as he ſuppoſes, by a labial failure; ſo that the people could not articulate. Thus their ſpeech was confounded, but not altered; for as ſoon as they ſeparated, they recovered their true tenor of pronunciation, and the language of the earth continued for ſome ages nearly the ſame. The interviews between the Hebrews and other nations, recorded in Scripture, were conducted without an interpreter; and he farther obſerves, that the various languages which ſubſiſt at this day retain ſufficient relation to ſhew, that they were once dialects from the ſame matrix, and that their variety was the effect of time. See DISPERSION.

CONFUTATION, in *Rhetoric*, &c. a part of an oration, wherein the orator ſeconds his own arguments, and ſtrengthens his cauſe, by refelling and deſtroying the oppoſite arguments of the antagoniſt. This is done by denying what is apparently falſe, by detecting ſome flaw in the reaſoning of the adverſe party, by granting their argument, and ſhewing its invalidity, or retorting it upon the adverſary.

Confutation makes a branch of what we call *confirmation.* The confirmation and confutation are ſometimes called *contention.*

Rhetoricians generally place confutation after confirmation, which ſeems agreeable to the natural method of thinking on any ſubject. For perſons firſt endeavour to find out ſuch arguments as are proper to maintain that ſide of a queſtion which they eſpouſe, before they conſider what objections may be offered againſt it: although in ſpeaking it may be neceſſary to vary the order, according to the nature of the diſcourſe. The method preſcribed by Quintilian (Inſt. Orat. l. v. c. 13.) is this, that, "if we bring a charge, we ſhould firſt prove it, and then anſwer objections; but if we ſtand upon the defence, we ought to begin with confutation." The forms of reaſoning are the ſame here as thoſe that occur under *confirmation.* But it is of importance to know the different modes of confutation practiſed by orators, which is often the more difficult taſk; becauſe he, who is to prove a thing, comes uſually prepared; but he, who is to confute it, is frequently left to a ſudden anſwer. Hence Quintilian ſays, that, in judicial caſes, "it is as much eaſier to accuſe than to defend; as it is to make a wound than to heal it." In all diſputes it is of the greateſt conſequence to obſerve, where the ſtreſs of the controverſy lies; and in confutation, what the adverſary has advanced ought carefully to be conſidered, and in what manner he has expreſſed himſelf. Thoſe things, which relate to the merits of the cauſe, may be confuted either by contradicting them, or by ſhewing ſome miſtake in the reaſoning, or their invalidity when granted. There are various ways in which things may be contradicted; what is apparently falſe may be expreſsly denied; and things which the adverſary cannot prove may be likewiſe denied. A thing may be alſo contradicted by ſhewing that the adverſary himſelf maintained the contrary. When you can fix contradictions on an adverſary, you effectually ſilence him; for this is ſtabbing him with his own weapon. Sometimes a thing is not in expreſs terms denied, but repreſented to be utterly incredible; and this method expoſes the adverſary more than a bare denial. There is, likewiſe, an ironical way of contradicting a thing, by retorting that and other things of the like nature upon the adverſe party. A ſecond mode of confutation is by obſerving ſome flaw in the reaſoning of the adverſe party. The laſt method of confutation is, when the orator does in ſome ſenſe grant the adverſary his argument, and at the ſame time ſhews its invalidity. This may be done in a variety of ways, according to the different nature of the ſubject. Sometimes he allows that what was ſaid may be true, but pleads, that what he contends for is neceſſary. At other times the orator pleads, that although the contrary opinion may ſeem to be attended with advantage, yet that his own is more juſt and honourable. Another way of confutation is by retorting upon the adverſary his own argument. The orator takes this advantage, when an argument proves too much, that is, more than the perſon deſigned it for, who made uſe of it. See INVERSION. Sometimes orators in confutation raiſe ſuch objections themſelves to what they have ſaid, as they imagine may be made by others; which they afterwards anſwer the better to induce their hearers to think, that nothing conſiderable can be offered againſt what they have advanced, but what will admit of an eaſy reply. See PROLEPSIS. See the ſeveral modes of confutation above recited illuſtrated by appoſite citations from Cicero's Orations in Ward's Oratory, vol. i. lect. 17.

As to the order and diſpoſition of the arguments, proper to be uſed in confutation; whether to follow the adverſe party, or alter his method, and range them in a different manner, as likewiſe whether to attack the weakeſt or ſtrongeſt arguments firſt; theſe things muſt be left to the diſcrétion of the ſpeakers.

CONG, in *Geography*, a village of the county of Mayo, Ireland, ſituated in the neck of land between the Loughs, Maſk, and Corrib. Large caverns and ſubterraneous waters are frequent in the neighbourhood; eſpecially at the back of the village, a very broad river ruſhes at once from beneath a gently ſloping bank, and after a rapid courſe of about a mile loſes itſelf in Lough Corrib. It is ſuppoſed to be the outlet of a ſubterraneous channel, through which the ſuperfluous waters of Loughs Maſk and Carrah are diſcharged into Corrib. Cong is about 108 miles weſt from Dublin, and 20 ſouth from Caſtlebar.

Cong, a town of China of the third rank, in the province of Honan; 15 miles ſouth of Hoai-king.—Alſo, a town of China of the third rank, in the province of Se-tchuen; 25 miles ſouth of Soui-tcheou.

CONGA, a town of Perſia, in the province of Irak-Agemi: 100 miles N. W. of Iſpahan.

CONGAREE, a conſiderable river of America, in the ſtate of S. Carolina, formed by the confluence of Saluda and Broad rivers. The union of the waters of Congaree and Wateree forms the Santee.

CONGAUTATA, in *Ancient Geography*, a ſtation on the line of Severus's wall in Britain, mentioned in the Notitia Imperii, and ſuppoſed to be at Stanwix.

CONGE, Apophyge, Gr. *Scapus*, Lat. in *Architecture*. The extremities of the ſhaft of a column when they are worked circularly to unite gradually with the filets of the baſe and capital are thus named.

Conge, in the *French Law*, a licence, or permiſſion, granted by a ſuperior to an inferior, which gives him a diſpenſation from ſome duty to which he was before obliged. The word is French: Menage derives it from the Latin *commiatus*, uſed for *commeatus*, and *commeare*, often ſeen among ancient writers: the Italians ſay, *congedo*.

A monk cannot go out of his convent, without the conge of his ſuperiors.

Conge *d'accorder*, i. e. *leave to accord*, or *agree*, is uſed in the ſtatute of fines, anno 18 Edw. I. to the following purpoſe. "When the original is delivered, in preſence of the parties before juſtices, a pleader ſhall ſay this: ſir, juſtice, *conge d'accorder*; and the juſtice ſhall ſay to him, What ſaith ſir R. and ſhall name one of the parties, &c."

Conge *d'elire*, is the king's permiſſion royal to a dean and chapter, in time of a vacancy, to chooſe a biſhop. See Bishop, Canon, and Collation.

Gwyn obſerves, that the king of England, as ſovereign patron of all biſhoprics and other benefices, had anciently the free appointment of all eccleſiaſtical dignities; inveſting, firſt, *per baculum & annulum*; and afterwards by letters patent: but that, in proceſs of time, he made the election over to others, under certain forms and conditions; as, that they ſhould at every vacancy, before they choſe, demand of the king *congé d'elire*, *i. e.* leave to proceed to election; and after election to crave his royal aſſent, &c. He adds, that king John was the firſt who granted this; which was afterwards confirmed by ſtat. Weſtm. 3 Edw. I. cap. 1. and again in the Articuli Cleri, 25 Edw. III. cap. 1.

Conge, in *Military Language*, leave of abſence granted to an officer or ſoldier from his corps, from the army or altogether from the ſervice. The old ſervice of France admitted of two kinds; namely, the *congé limité*, a ſpecific or limited leave, and the *congé abſolu*, or an abſolute diſcharge. In the latter caſe there was delivered to the ſoldier a *cartouche*, with all the ſignatures on it neceſſary for the good order and regularity of the ſervice, and for the tranquility of the perſon, who obtained it. The *congé abſolu* was always ſuſpended in time of war.

CONGEABLE, from the French *congé* (i. e. *leave*, *licence*, or *permiſſion*), ſignifies as much as lawful, or lawfully done, or done with leave or permiſſion; as, *then entry of the diſſeiſee is* congeable.

CONGELATION (from the Latin *congelo*), means the tranſition of a liquid into a ſolid ſtate, in conſequence of the abſtraction of heat; thus metals, butter, oils, water, &c. are ſaid to *congeal*, when, from a fluid ſtate, they paſs into that of a ſolid.

Congelation and freezing mean, in fact, the ſame effect; yet the term congelation is indiſcriminately applied to all the above-mentioned tranſitions; whereas the word freezing is more commonly uſed for denoting the congelation of water, of vinegar, of brandy, of mercury, and in ſhort of all thoſe ſubſtances which, in order to become ſolid, muſt be cooled below 32° of Fahrenheit's thermometer. We ſhall, however, in this work, divide the ſubject of congelation under the two above-mentioned denominations; ſtating, under the preſent article, whatever relates to natural congelation, and under the article Freezing, whatever relates to the artificial methods of freezing.

Another important proceſs, much connected with congelation, has been improperly ſeparated from it. And this is *cryſtallization*, or the arrangement of certain ſubſtances into regular figures, in their tranſitions from the fluid into the ſolid ſtate; but water and ſeveral other bodies likewiſe cryſtallize in congealing, which ſhews that the two proceſſes can hardly be ſeparated; and this is rendered ſtill more evident by a due conſideration of other phenomena that accompany both proceſſes. Allowing therefore that cryſtallization and congelation are eſſentially of the ſame claſs, a ſlight diſcrimination may be formed by applying the term cryſtallization to the formation of thoſe regular forms or cryſtals, which are of a compound nature, and which, when once formed, generally require a much greater degree of heat for their liquefaction, than that in which they were formed.

By far the greater number of liquids we are acquainted with, have been found capable of congelation in a proper temperature; and on the other hand moſt of thoſe ſolids which are ſuch in the uſual temperature of the atmoſphere may be rendered fluid by the application of certain appropriate degrees of heat; hence we are led by analogy to ſuppoſe, that every fluid might be congealed, if it were poſſible to cool it ſufficiently; or that fluidity is the effect or conſequence of heat. Every particular kind of ſubſtance requires a different degree of temperature for its congelation; hence it appears why certain ſubſtances remain always fluid, whilſt others remain always ſolid, in the ordinary temperature of the atmoſphere, and why certain other ſubſtances are ſometimes fluid, and at other times ſolid, according to the viciſſitudes of the weather, the difference of ſeaſons, and the variety of climates.

Heat, or ſenſible caloric, continually tends to paſs from thoſe bodies which have more of it than their proper ſhare, to thoſe contiguous bodies which have leſs of it than their proper ſhare; hence, when a body is placed amongſt other bodies of a lower temperature, its heat gradually paſſes to thoſe other bodies, until the whole acquires the ſame temperature; and this tranſition proceeds regularly, excepting, however, when the body is in the act of aſſuming the ſolid ſtate; for at that moment a ſudden extrication of heat is obſervable. Place a thermometer in a glaſs full of water, and place the glaſs in a freezing mixture of broken ice, and common ſalt, the thermometer will be found to deſcend gradually as low as 30, or 28 degrees of Fahrenheit's thermometer, and ſometimes even much lower, whilſt the water remains fluid; but, at laſt, the water begins to freeze, and at that very moment the thermometer riſes ſuddenly to 32°, and it remains at that point until the whole of the water is congealed. If then the application of the freezing mixture be continued, the thermometer will ſink gradually ſeveral degrees below 32°, according to the activity of the freezing mixture. We may, Dr. Black obſerves, eaſily ſatisfy ourſelves, that the water, while congealing, is continually imparting heat to the ſurrounding air; for, if we ſuſpend a delicate thermometer immediately above the water, we ſhall find the inſtrument affected by an aſcending ſtream of air, leſs cold than the air around.

Not only pure water, but all aqueous fluids, may be cooled down 7, or 8, or 10 degrees without freezing; but if in that ſtate they be affected with a tremulous motion, or if they be touched with a ſlender piece of ice, they will inſtantly ſhoot into beautiful ſpiculæ, the thermometer in it riſing at the ſame time. This ſtriking phenomenon of the ſudden riſing of the thermometer at the moment of congelation, which has alſo been remarked in wax, ſpermaceti, and other ſubſtances, has not yet been fully or ſatisfactorily explained, It is true that ice has not ſo great a capacity for containing heat as water has; (ſee the capacities of bodies under the article Caloric and Heat); but why ſhould water ſo reluctantly part with that ſuperfluous quantity of heat as to ſuffer itſelf ſometimes to be cooled ſeveral degrees below 32, before it will aſſume the ſolid form?

Since water, when it has once begun to congeal, remains at the apparent temperature of 32° until the whole of it is congealed; and ſince water cannot remain congealed in a temperature higher than 32°; therefore the congealed point of water has been fixed at 32°. of Fah.

The congealing points of ſeveral other ſubſtances have alſo been aſcertained with conſiderable accuracy. In ſome, however, it is not the congealing, but the melting, point that has been aſcertained. Theſe two points, if they be not quite the ſame, may naturally be ſuppoſed not to differ more than about a degree or two; hence from the latter the former may be eaſily deduced. In the following table, however, we ſhall ſet down the one or the other of thoſe points, according as either of them has been more accurately determined.

Table of the congealing, or melting points of different ſubſtances, expreſſed in degrees of Fahrenheit's ſcale; the high degrees of which have been eſtimated by the equivalent degrees of Wedgwood's thermometer,

Platina melts		23177°. F.
Manganeſe melts		28877.
Iron melts		21637.
Nickel melts		20577.
Pig iron begins to melt Cobalt melts		17977.
Fine gold melts		5237.
Settling heat of flint glaſs		4847.
Fine ſilver melts	according to Mr. Wedgwood	4717.
	according to Sir James Hall	3937.
Swediſh copper melts		4587.
Braſs melts		3807.
Zinc melts		700.
Lead melts	according to Newton	540.
	according to Seconat	585.
	according to Irvin	594.
	according to Parker	612.
Lead fixes, according to Crichton of Glaſgow		612°. F.
Biſmuth melts		460.
	according to Irvin	470.
A mixture of one part of tin and four of lead, melts		476.
Tin melts		408.
	according to Irvin	413.
	according to Crichton of Glaſgow, it congeals at	442.

The laſt mentioned gentleman ſays, "in melted tin the thermometer ſunk gradually till it arrived at 442°; then it inſtantly ſunk to 439°; and as inſtantly roſe to 442°. At this temperature the mercury remained perfectly ſtationary for five minutes, at which time the metal became ſolid to the centre of the crucible."

A mixture of three parts of tin and two of lead melts A mixture of two parts of tin, and one of biſmuth melts	334.
A mixture of tin and biſmuth, in equal parts, melts	283.
Sulphur melts	234.
A mixture of five parts of biſmuth, three of tin, and two of lead, melts	212.
A mixture of three parts of tin, five of lead, and eight of biſmuth, melts	219.
Serum of blood begins to coagulate at	156.
Albumen, or the white of an egg, coagulates at	156.
Bees wax melts	142.
Tallow melts	127.
Spermaceti melts	112.
Ice, or congealed water, begins to melt	32.

The increaſe of the bulk of water previous to, as alſo following, its point of congelation is a remarkable property, which has been more or leſs obſerved with all aqueous fluids, *viz.* they are contracted by cold, until a certain limit, which generally is about 7 or 8 degrees higher than their congealing point; they then expand again as they are cooled farther, and if they are not agitated, they will remain liquid at a temperature lower than their congealing point. The greateſt denſity of water, Count Rumford ſays, is ſomewhat lower than 40°. Profeſſor Hope of Edinburgh places it between 39°.5 and 40°. Mr. Dalton ſays, that the greateſt denſity of water is at the temperature of 42°.5. And that the expanſion of water is the ſame at the diſtance of the ſame number of degrees above and below 42°.5. Thus the expanſion is the ſame at 32° and 53°; the ſame at 10° and 75°, &c. The increaſe of bulk in freezing water is not owing to the formation of air bubbles, for water, which has been deprived of air, will alſo expand in freezing. The bulk of ice, at a mean, is to that of the water which it produces, as 9 to 8. This enlargement of bulk is attributed to a cryſtallization; the particles of water in freezing tend to arrange themſelves ſo as to form angles of about 60 and 120 degrees; and this tendency is exerted with a prodigious force. Mr. Leſlie ſays, "water neceſſarily diſcharges its air previous to the act of congelation; a circumſtance which ſometimes retards that ſpecies of cryſtallization. Hence it is, that water freezes ſooner which has been boiled. When expoſed to cold, crude water will preſent a cake of ice crowded with large bubbles entangled in the maſs; but boiled water will contain a ſolid lump, almoſt pellucid, with only ſome minute ſpecks or ſtriæ ſhooting from the centre." Dr. Black ſays, that boiled water begins to freeze as ſoon as the air has cooled it to 32°. Iron likewiſe occupies leſs room when fluid than when ſolid. And the ſame thing has been aſſerted of two or three other metallic ſubſtances.

Vinegar congeals at about - - - 28°. F.
Human blood congeals at - - - - 25.
Strong wines congeal at about - - - 20.
A mixture of one part of alcohol and three of water congeals at - - - - - 7.
A mixture of alcohol and water, in equal parts, congeals at - - - - - - - *minus* 7.
A mixture of two parts of alcohol and one of water, congeals at - - - - *minus* 11.
Mercury congeals at - - - *minus* 39.

Mercury expoſed to cold, and at about the point of congelation, contracts its bulk irregularly. This ſubſtance may be cooled ſome degrees below its freezing point, before it aſſumes the ſolid form; but as ſoon as it begins to harden, the thermometer riſes to its freezing point, which, from a variety of experiments made by Mr. Hutchins at Hudſon's Bay, appeared upon his thermometer to be —40°. "But (Mr. Cavendiſh obſerves in the Phil. Tranſ. vol. lxxiii. p. 321.) as it appeared from the examination of his thermometer, after it came home, that —40° thereon anſwers to —$38\frac{2}{3}$ on a thermometer adjuſted in the manner recommended by the committee of the Royal Society; it follows, that all the experiments agree in ſhewing that the true point at which quickſilver freezes, is —$38\frac{2}{3}$, or in whole numbers 39° below nothing."

In becoming ſolid, mercury ſometimes ſhoots into cryſtals or longitudinal filaments like pins. The firſt obſervations concerning the natural congelation of mercury were made by Mr. Gmelin about the year 1735, at Yeneſeick in lat. $58\frac{1}{2}$° north, at Yakutſk in lat. 62° north, at Rivengo, lat. $57\frac{1}{2}$° north, and elſewhere. (See the Peterſburg Commentaries for the years 1756 and 1765). Profeſſor J. A. Braun, of Peterſburg, in the year 1759, firſt accompliſhed the congelation of mercury by art, *viz.* by means of ſnow and aqua fortis. But with reſpect to the artificial methods of congealing mercury, and their hiſtory, ſee the article FREEZING.

Nitric acid is ſaid to congeal at - - *minus* 66.

With reſpect to the congelation of the ſulphuric, or vitriolic acid, the greateſt number of experiments ſeems to have been made by Mr. Keir, and from thoſe experiments he infers: "1. That the vitriolic acid has a point of eaſieſt freezing, and that this is when its ſpecific gravity is to that of water as 1780 to 1000. 2. That the greater or leſs diſpoſition to congelation does not depend on any other circumſtance than the ſtrength of the acid. 3. That the freezing and thawing degree of the moſt congealable acid is about 45° of Fahrenheit's ſcale. It is, however, to be obſerved, that this degree is inferred from the temperature indicated by the thermometers immerſed in the freezing and thawing acids; but the congelation of the fluid acid could never be accompliſhed without expoſing it to a greater degree of cold, either by expoſing it to the air in froſty weather, or to the cold of melting ſnow. 4. Like water, this acid poſſeſſes the property of retaining its fluidity when cooled ſeveral degrees below the freezing point; and of riſing ſuddenly to it when its congelation is promoted by agitation, or by contact even with a warmer thermometer. 5. That, like water and other congealable fluids, the vitriolic acid generates cold by its liquefaction, and heat during its congelation, though the quantity of this heat and cold remains to be determined by future experiments. 6. That the acid, by congelation, when the circumſtances for diſtinct cryſtallization are favourable, aſſumes a regular cryſtalline form, a conſiderable ſolidity and hardneſs, and a denſity much greater than it poſſeſſed in its fluid ſtate."

The heat of the earth, at leaſt on the ſurface of it, is derived entirely from the ſun; for the heat ariſing from combuſtion, as about volcanos, or from decompoſition of bodies, is trifling and partial. The direct rays of the ſun on the ſame ſpot of the ſurface of the earth heat it more or leſs, according to the time of the year, clearneſs of the atmoſphere, ſtate of the winds, colour and quality of the ſpot. In Great Britain, during the hotteſt time of the ſummer ſeaſon, the direct rays of the ſun ſeldom raiſe the mercury in the thermometer ſo high as 110°. But in other climates, eſpecially within the tropics, the mercury is raiſed conſiderably higher by the like expoſure. Yet we muſt not believe the idle ſtories of the ſun's heat melting lead, or ſetting fire to gun-powder, without the aſſiſtance of lenſes, ſpeculums, or other artifice.

It is not on account of the ſun's being nearer or farther from the earth, that we receive much more heat in the ſummer than in the winter time; ſince the difference of thoſe diſtances is too ſmall to be ſenſibly felt; but we receive more heat in the ſummer than in the winter ſeaſon. 1. Becauſe the ſun comes nearer to our zenith in the ſummer than in the winter time, in which ſituation its rays paſs through a ſhorter portion of the atmoſphere, and of courſe are leſs intercepted by it. 2. Becauſe, when the ſun is nearer to the zenith, a greater quantity of its rays falls upon a given horizontal part of the ſurface of the earth, than when that luminary ſtands lower, and its rays fall more obliquely upon the ſame ſpot. 3. Laſtly, becauſe the ſun remains longer above the horizon during a ſummer day than a winter one.

The hotteſt part of the day is not at noon, nor that of the year when the ſun paſſes neareſt the zenith of a given country; but the hotteſt part of the day, when no accidental circumſtance intervenes, is ſome time in the afternoon, and nearer to noon in the winter than in ſummer. In this country and in ſummer, the hotteſt part of the day generally is either preciſely at, or a little before, two o'clock. The hotteſt time of the year in this country generally takes place in July, *viz.* after the ſolſtice. The reaſon of this is, that though the rays of the ſun give more heat when the ſun ſtands higher, and of courſe at two o'clock they muſt give leſs than at noon; yet the earth, and the air contiguous to it, are hotter at two o'clock, becauſe, beſides the heat which they are actually receiving from the ſun, they retain a conſiderable portion of the heat acquired before that time; ſo that as long as they acquire at any particular time, a greater quantity of heat than they loſe of that which they had previouſly acquired, their temperature muſt continue to increaſe. The ſame thing muſt be underſtood with reſpect to the communication of cold, which, for ſimilar reaſons, is greateſt ſome time after midnight, and ſome time after the ſhorteſt days of the year. The earth acquires heat in the day time, and loſes it during the night. In the ſummer ſeaſon the loſs of heat during the night is leſs than the acquiſition of it during the day; therefore that exceſs of heat is gradually communicated from the ſurface to the more internal parts of the earth. But when the above-mentioned ſummer heat has penetrated a certain way, the winter cold begins to counteract it; and when that cold has penetrated a certain way, the next ſummer heat begins again to counteract it, and ſo on; hence, below a certain depth there is no alteration of temperature at any time of the year; unleſs ſome local combuſtion or other ſource of heat ſhould interfere, which, however, ſeldom occurs. This fixed degree of temperature at a certain depth below the ſurface of the earth, varies in different countries, and nearly coincides with the mean temperature of the particular country. Thus in London the mean temperature is 50°; and if a bucket of water be drawn from a pretty deep well, and a thermometer be inſtantly placed in it, the temperature of that water, (which is the ſame as that of the ground ſurrounding the bottom of the well) will alſo be found to be 50°. In proceſs of time the mean temperature of a country is liable to ſome alteration ariſing from cultivation, clearing of grounds, draining of marſhy grounds, &c. See Climate.

With reſpect to the temperature at different altitudes, it has been found that a thermometer placed cloſe to the ground is ſometimes affected by heat or cold, ſooner, or in a greater degree, than a thermometer placed 20, or 30, or 60 feet, higher up; and that at other times the latter is affected ſooner, or in a greater degree, than the former. In the night time, eſpecially when the air is ſtill, and the ſky quite free from clouds, a thermometer cloſe to the ground generally indicates a greater degree of cold than in a higher ſituation. The true cauſe of this phenomenon is not fully underſtood; though it is attributed to evaporation, or according to Mr. Six, to the coolneſs which the dews or vapours may acquire in their deſcent.

At great heights above the ſurface of the earth, either in the free air, or on the ſummit of high mountains, the cold is much greater, and it increaſes more ſuddenly; 1ſt, becauſe they are much more expoſed, and 2dly, becauſe they are more remote from the body of the earth, which, as has been obſerved above, tends to equalize the temperature, by retaining in the winter time a conſiderable degree of the heat acquired in the courſe of the ſummer. The winds to which mountains are expoſed, eſpecially thoſe which, after having blown over the plains below, riſe along their ſides, have a peculiar refrigerating power, ariſing from the expanſion of the aſcending air, which becomes capable of abſorbing more heat in proportion as it is more rarefied. See Dr. Darwin's Paper, Phil. Tranſ. for 1788.

Thus we have briefly ſtated the natural ſources, and the principal cauſes which check or promote the heat and the cold, that are uſually experienced in the world, at different times of the day, of the year, and in different countries; whence alone one may pretty well conceive where and when natural congelation may be expected to take place. Yet it is neceſſary to ſubjoin ſome farther obſervations, that have been made with reſpect to natural congelation at different times and different places.

The greater obliquity with which the ſun's rays fall upon the northern and ſouthern parts of the earth, than they do upon ſuch parts as are near the equator, undoubtedly produces the variety of the mean temperatures that are obſerved in different latitudes; the higher latitudes being generally colder than the lower, and *vice verſâ*. But this gradation is partly counteracted by a variety of local circumſtances; and ſuch are the vicinity of large tracts of land or great extent of ſea, the face of the country being flat or hilly, the diſpoſition of the hills and mountains, the prevalence of rain and of certain winds, the ſtate of cultivation, &c. The influence of winds in certain latitudes is ſo very great that a froſt or thaw is brought on within a remarkably ſhort time by a change of the wind. The action of winds on the temperature of a country principally depends upon three circumſtances, *viz.* on their bringing a quick ſucceſſion of new air in contact with the bodies that are expoſed to it, on their having paſſed over the ſurface of hotter or colder tracts of water or land, and upon their increaſing the evaporation. Sauſſure found that when the wind moves at the rate of forty feet per ſecond, it triples that quantity of evaporation that would take place in calm air; hence it follows that frequently unuſual heats or colds come on at unexpected times, and that the higher ſtrata of the atmoſphere are often warmer than the lower; for the heat of the atmoſphere is derived not from the immediate action of the ſun's rays which paſs through it, but from the warmer and more ſolid bodies with which it has been, or is, in actual contact. In conſequence of theſe various circumſtances, it has been obſerved that the north Pacific Ocean, above latitude 40°, is much colder than the north Atlantic, between the ſame parallels of latitude. The interior parts of Siberia, eaſt of longitude 100°, are much colder than the parts equally diſtant from the meridian on the weſtern ſide. The coaſt and interior parts of the weſtern regions of America are much colder above the latitude of 40°, than the correſponding tracts of the continent of Europe. Large ſeas, which are agitated by winds and currents, are thereby ſo little affected by cold winters or hot ſummers, as to preſerve a temperature nearly uniform in every ſeaſon, like the internal parts of the earth.

With reſpect to the mean temperature of places at different altitudes above the level of the ſea, but in the ſame country, or nearly about the ſame ſpot with reſpect to latitude, the heat diminiſhes nearly one degree of Fahren. for every 200 feet of elevation, according to Dr. Black. Other writers find reaſons to aſſert, that the diminution of one degree takes place at every 299 feet of elevation.

From the ſtatement of all the above particulars the reader may form ſome idea of the time and place when natural congelation may be expected, and he will at the ſame time be able to perceive that cloſe to the ſurface of the earth, no great regularity can be expected. On the continent of Europe congelation formerly took place at a lower latitude than it does at preſent, when natural congelation is ſeldom obſerved lower than the latitude of 40°. In America congelation has been obſerved at a much lower degree; and it is remarkable that great degrees of heat, as well as great degrees of cold, are alternately experienced on the ſame ſpots of that continent. In the more northern parts of the world the degrees of cold are very extraordinary. At Torneao, Reaumur's ſpirit thermometer fell to minus 34°. In Siberia the ſpirit thermometer has been known to deſcend as low as minus 121°. Even at the Glaſgow obſervatory in the year 1780, the mercury of the thermometer expoſed to the ambient air was found to ſtand at minus 14°.

The altitude on the ſides of mountains, at which conſtant congelation takes place, ſeems to be leſs fluctuating, though not accurately aſcertained. This altitude varies with the latitude; but even in the torrid zone perpetual congelation has been obſerved (according to Bouguer and others) at the altitude of about 15600 feet. This altitude, at which the congelation is conſtant, or where water ceaſes to be a fluid, and beyond which viſible vapour does not ſeem to aſcend, is called the *upper line of congelation*. The *lower line of congelation* is where it freezes at night only. The upper line of congelation, within the tropics, has been obſerved at the altitude of 15600. Near the tropics, on the ſides of the temperate zones, it lies at the height of about 13428 feet. On the iſland of Teneriffe, in lat. 28° N., it lies at the altitude of about 10000 feet. In Auvergne, lat. 45° N., the line of congelation is at the altitude of 6740 feet. In latitude between 51° and 54° N. it ſeems to be at the altitude of about 5800. In latitude 80° north, lord Mulgrave found the line of congelation at the altitude of about 1200 feet above the level of the ſea; whence, if the progreſſion continues uniformly, as general Roy obſerves, we may conclude that the ſurface of the earth, at the pole itſelf, is for ever covered with congelation. Mr. Kirwan, however, places the upper line of congelation conſiderably higher. See his paper on the variations of the atmoſphere, in the 8th vol. of the Tranſ. of the

Royal Iriſh Academy. He reckons the altitude of the line of congelation from 0° to 10° of north latitude, at about 27700 feet; from 10° to 15° at about 26400 feet; from 15° to 20°, at about 25200 feet; from 20° to 25°, at about 24000 feet; from 25° to 30°, at about 22000 feet; from 30° to 35°, at about 20000 feet; from 35° to 40°, at about 17000 feet; from 40° to 45°, at about 15000 feet; from 45° to 50, at about 12500 feet; and for every one of the other degrees of latitude, at the altitudes which are annexed to them in the following table. Theſe reſults, however, he deduced by computation from a few aſcertained particulars.

Degrees of N. lat.	Altitude of the line of congelation.	Degrees of N. lat.	Altitude of the line of congelation.
51°	10124	71°	4354
52	8965	72	4295
53	7806	73	4236
54	6647	74	4177
55	5617	75	4119
56	5533	76	4067
57	5439	77	4015
58	5345	78	3963
59	5251	79	3911
60	5148	80	3861
61	5068	81	3815
62	4989	82	3769
63	4910	83	3723
64	4831	84	3677
65	4752	85	3631
66	4684	86	3592
67	4616	87	3553
68	4548	88	3514
69	4480	89	3475
70	4413	90	3432

CONGENERES *muſculi*, in *Anatomy*, are ſuch muſcles in an animal body, as ſerve together to produce the ſame motion; and they are ſo called becauſe they aſſiſt one another in their action.

CONGER, or CONGER-EEL, in *Ichthyology*, the largeſt of the Muræna tribe. This voracious fiſh grows to the length of five or ſix feet, and the thickneſs of a man's thigh. The colour of the upper part is dark grey, ſometimes inclining to olive, and the belly pure white; but it is principally diſtinguiſhed from the other ſpecies of the muræna genus by having the lower jaw rather ſhorter than the upper; noſe with two tentacula, and the lateral line whitiſh, with a row of ſpots. See MURÆNA.

CONGERIES, a Latin word, ſometimes uſed in our language for a collection or heap of ſeveral particles, or bodies, united into one maſs or aggregate.

CONGERIES, in *Rhetoric*. See SYNATHROISMUS.

CONGESTION, in *Medicine*, has been uſed to denote an enlargement of any part of the body, eſpecially when accompanied with hardneſs, or alteration of ſtructure, which, in the opinion of the humoral pathologiſts, was produced by a collection of morbid humours, depoſited in the part. The term is ſtill employed, chiefly to expreſs the morbid increaſe of diſtention in the blood-veſſels in inflamed parts, or morbid effuſions of blood or lymph in the viſcera. Thus, a *congeſtion* of blood in the veſſels of the brain is ſaid to have produced apoplexy, when, on diſſection, veſſels which are uſually inviſible, are obſerved to be filled with red blood; and congeſtion is ſaid to exiſt in the lungs, when the circulation of the blood through the minute ramifications of the blood-veſſels is impeded, or when lymph is poured out into the cells of the bronchiæ, as in the catarrhus ſenilis, and peripneumonia.

CONGHE' LAKE, in *Geography*, a lake of Thibet, which intervenes between the Mangarvar lake, and the head of the river Sanpoo.

CONGIARUIM, CONGIARY, among *Medaliſts*, a gift or donative, repreſented on a medal.

The word comes from the Latin *congius*; becauſe the firſt preſents made to the people of Rome conſiſted in wine and oil, which were meaſured out to them in congii. The congiary was properly a preſent made by the emperors to the people of Rome. Thoſe made to the ſoldiers were not called *congiaries*, but *donatives*.

The legend on medals repreſenting congiaries, is *congiarium*, or *liberalitas*.

Tiberius gave a congiary of three hundred pieces of money to each citizen: Caligula twice gave three hundred ſeſterces a head. Nero, whoſe congiaries are the firſt that we find repreſented on medals, gave four hundred. The congiarium of Nerva had on its reverſe five figures.

CONGIO, or CUNGIO, CAMILLO, in *Biography*, was a deſigner and engraver of conſiderable talents. He was born at Rome about 1604. Little is known of his life, except that he followed his profeſſion at the place of his nativity, and at Florence. About the year 1630, he engraved ſeveral of the plates for the Galleria Juſtiniana. Moſt of the twenty plates for Taſſo's Jeruſalem, from the deſigns of B. Caſtelli, are by Congio, as likewiſe ſeveral of the engravings in the fine work entitled Odes Barberinæ. Beſides the above, we have many prints by him executed in a bold and firm manner, from the deſigns or pictures of Tempeſta Lanfranco, Pomerancio, and other maſters, and ſome from his own drawings. His plates are generally marked with two C's, the top of one joined to the bottom of the other; or in this manner: C. C. F. the F. ſtanding for fecit. Strutt. Huber, Manuel des Arts.

CONGITELLA, in *Antiquity*, half a congius.

CONGIUM, in *Ancient Geography*, a town of Spain, placed by Ptolemy in the Tarragonenſis territory; the country of the Vaccæans, ſuppoſed to be the preſent Cabeçon.

CONGIUS, an ancient Roman meaſure of capacity, or for things liquid, = $\frac{1}{8}$ of a cubic old Roman foot, = 8 ſextaries, = 197.137 cubic Engliſh inches, = .1141 cubic Engliſh feet.

From the original ſtandard of Veſpaſian extant at Rome, Greaves deduced the value of the Roman pound to be 5256 Troy grains. See DENARIUS. But Mr. Raper, in an excellent paper on this ſubject, has ſuggeſted ſeveral objections againſt the accuracy of this concluſion. Phil. Tranſ. vol. lxi. part ii. p. 496.

The congius has alſo been uſed in England, as appears by a charter of king Edmund in 946.

CONGLETON, in *Geography*, a ſmall corporate town in Cheſhire, England, is ſituated near the upper part of the river Dane, on the borders of Staffordſhire, and governed by a mayor and ſix aldermen. It poſſeſſes two churches, both ſubject to the mother church of Aſtbury, a village two miles diſtant. The town was formerly celebrated for the manufacture of tagged leather laces, called Congleton points; but the chief employment of the poor is now derived from a very capital ſilk mill erected on the river; and from a ribbon manufactory. In the church-yard of Aſtbury are two ancient ſtone monuments, ornamented with the inſignia of knighthood; but the families whoſe memory they were intended to record are now unknown. Congleton is 163 miles N.W. from London; has a market on Saturdays.

In the return under the late act the houſes were eſtimated at 855, the inhabitants at 3861, of whom 1713 were males and 2148 females.

CONGLOBATE *glands*, in *Anatomy*, thoſe glands whoſe ſubſtance is not divided, but firm, entire, and continued; and their ſurface ſmooth and uniform.

They are thus called, in oppoſition to *conglomerate* glands. Conglobate glands have each of them an artery which brings them blood, a vein which carries it back again, after the proper juice has been filtrated, and ſeveral excretory ducts.

Some of them have a cavity in the middle, with lymphatic veſſels, which diſcharge themſelves into a common reſervoir, or canal.

CONGLOBATE *flowers*. are thoſe with globular heads.

CONGLOMERATE *glands*, are thoſe which are compoſed of ſeveral little ones; or they are ſeveral glandulous bodies joined together under the ſame common membrane. See GLAND.

Such are the ſalival glands, lachrymal glands, the pancreas, &c. which ſee under their proper articles.

The conglomerate glands, beſides their arteries, veins, and nerves, are alſo furniſhed with an excretory veſſel, ramified throughout their own ſubſtance; by means whereof they diſcharge the liquors they have filtrated into reſervoirs.

CONGLOMERATE *flowers*, are thoſe which are irregularly crowded together.

CONGLOMERATION, in *Mineralogy*, is the term uſed to expreſs confuſed mixtures or concretions of different mineral ſubſtances. Kirwan's Geol. Eſſays, p. 303 and 306.

CONGLUTINATION, the act of gluing, or faſtening two bodies together, by the intervention of ſome third, whoſe parts are unctuous and tenacious, in the nature of a glue, *gluten*; from whence the word is formed.

In the animal œconomy, the parts of the body are ſaid to be conglutinated by means of their natural moiſture; by the help of bandages, as in ſeveral caſes of ſurgery; or by the ſupply of viſcid particles. In which laſt acceptation, conglutination differs little from accretion, or nutrition

CONG-MOU-ING, in *Geography*, a town of China, in the province of Se-tchuen; 42 miles N.W. of Hoei-li.

CONGO, or KONGO, a name given to the country of Africa, otherwiſe called *Lower-Guinea*, which ſee. It is commonly divided into Loango, Angola, Benguela, and Congo Proper.

CONGO, or KONGO, *Proper*, a kingdom of Africa, bounded on the north by the famous river Zair or the river of Congo, which divides it from that of Loango, on that ſide; on the ſouth by that of Dando, which ſeparates it from the kingdom of Angola; on the eaſt by the kingdoms of Fungono and Metamba, and the burnt mountains of the ſun, thoſe of cryſtal or ſalt-petre and ſilver, and by the rivers Verbela and Chilandea; and on the weſt by the Ethiopic ſea, called the ſea of Congo. Its extent from N. to S. and from E. to W. has not been accurately aſcertained; but according to the relation of John Anthony Cavazzi de Monte Cuculo, a Capuchin miſſionary, the dominions of the kings of Congo were much extended towards the eaſt and the ſouth, before the introduction of the Chriſtian religion; but ſince this event, many of the remote provinces in theſe directions have been diſmembered, ſo that Congo was reduced from above 600 leagues in circuit to leſs than one-half of that extent. Being ſituated under the torrid zone, it is ſubject to the exceſſive heats peculiar to that climate; however, they are conſiderably mitigated by winds and breezes, rains and conſtant dews; as well as by the more equal length of days and nights. Their ſummer and winter, which compoſe their year, are divided into ſix ſeaſons, which they call maſſanza, neaſu, ecundi, quitombo, quiliſo, and quimbangala. The firſt commences with the month of October; which is the beginning of their ſpring, when the rains begin to fall; and they continue during the two, and ſometimes the three, next months. The floods that are thus occaſioned are commonly followed by a famine. Their ſecond ſeaſon begins about the end of January, which is followed by harveſt and new ſowing; their lands commonly yielding them two harveſts. The third and fourth ſeaſons are frequently blended towards the beginning of March, when the more gentle rains begin to fall and continue till the month of May; at which time the air is clear and dry, but occaſional clouds burſt forth into tremendous lightning and thunder without rain; theſe two ſeaſons laſt till about the beginning or ſometimes till the end of September. The two laſt ſeaſons conſtitute their winter, which conſiſts not in froſt or ſnow, for theſe are unknown in this climate, but in dry blaſting winds, that ſtrip the earth and trees of their verdure, till the next maſſanza, or ſpring, reſtores their vernal bloom. The Congoeſe divide the year into twelve lunar months, commencing like that of the Jews, in September. Their week conſiſts of four days; three of which are appointed for labour, and the fourth for reſt or religious exerciſes. The general indolence of the inhabitants prevents their deriving any ſubſtantial benefit from the fertility of their ſoil, which duly cultivated would yield a double, and ſometimes a triple, crop yearly. But the negroes, averſe from labour, ſpend their time in dancing, leaping, hunting, and ſhooting, or in ſmoaking and more liſtleſs indolence; whilſt they commit to their ſlaves, or their wives, the operations of digging, ſowing, reaping, cutting woods, grinding corn, and fetching water. Their ground produces variety of grain, but no corn or rice beſides that which is cultivated by the Portugueſe. Of their maiſe, of which they have regularly two crops, they make their bread. They have three other ſorts of grain, which they apply to the ſame purpoſe. They alſo cultivate a variety of pulſe, as beans and peaſe of different ſorts, which ſerves them for part of their food. Their fruit-trees have been chiefly trees planted there by the Portugueſe; and of palm-trees, which are exotic and brought from America, they have no leſs than eight ſorts, which are all excellent in their kind. If we may credit the accounts that are given of the productions of the country, which ſometimes border on the fabulous, they have a tree called Aliconda, ſo large that ten men cannot fathom it, yielding a fruit which reſembles a gourd, and which ſerves for veſſels of various uſes; the bark of which furniſhes them with a coarſe thread, which they form into ropes and into a cloth, with which the natives cover their middle from the girdle to the knees; and the ſmall leaves of which ſupply them with food in a time of ſcarcity, while the large ones are uſed for covering their houſes, or by burning for the manufacture of good ſoap. Of the bark of the infanda tree, and alſo of the mulemba, reſembling in many reſpects our laurel, they form a kind of ſtuff or cloth, which is fine and uſed for cloaks and girdles by perſons of the higheſt rank. The oil of their palm-trees is uſed inſtead of butter; with the moſs that grows about the trunk, the rich commonly ſtuff their pillows; and the Giagas apply it to their wounds with good effect: with the leaves the Moors cover their houſes, and they draw from theſe trees, by inciſion, a pleaſant liquor like wine, which however turns ſour in five or ſix days. From the Congo palm-tree, ſo called, becauſe it thrives better in that country than any of the other ſorts, they obtain a liquor, which is reckoned as valuable as the wine that is brought from Europe, though it is rather a kind of milk, ſweet and agreeably tart, which will become ſour in three or four days, and is ſo ſtrong and heady, that a pint of it will produce intoxication. The fruit of this tree, not unlike a peeled cheſnut in colour, taſte, and ſubſtance, is the common food of the poorer claſs. With the oil that is drawn from it the natives dreſs their victuals; but the Europeans only burn it in their lamps. Of their ſhrubs we ſhall only mention that which they call capano, or "the fig of hell," from the nut of which they extract an oil for the lamp, and which they alſo uſe in the compoſition of their ointments and plaſters. The leaves burnt to aſhes, afford a good lye, with which the natives waſh their bodies. The Portugueſe have taken care to plant ſeveral other fruits, as oranges, lemons, citrons, granates, cedars, and others, which thrive as well as in their native ſoil. Vines have alſo been brought hither from Candia; and they yield excellent grapes twice a year. They have alſo plants of the aromatic kind, which yield ſubſtitutes for cinnamon and pepper. Their manioc, of which they make bread, is the ſame which is uſed in Aſia and America; their potatoes and other roots of a like kind yield a grateful nouriſhment. Wheat is the only grain which the ground will not produce, as it ſhoots up into ſtraw and ear, the former being high enough to hide a man on horſe-back and the latter being unfilled. Their graſs grows to a great height, and affords ſheltering places for a variety of wild and voracious beaſts, and venomous inſects; ſo that it is dangerous to travel through the country on this account. Their lilies, tulips, tuberoſes, hyacinths, &c. grow wild, and are ſingularly beautiful.

The principal rivers of this country are the Zair, into which fall the Bancaro, Vambra, Coungo, and Barbela or Vervel, the Dando, which ſee reſpectively. Between the Zair and Dando, are the Lchunca, Doce, Ambriz, Loze, Onzo, and Lutana, with ſeveral others of leſs note.

Congo is divided into ſix large provinces, under the titles of duchies, counties, and marquiſates, and theſe again are ſubdivided into leſſer ſigniories or lordſhips. The ſituation of theſe provinces is as follows; along the ſea coaſt lie the county of Sogno, and the great duchy of Bamba; on the north, the duchy of Sundi, and the marquiſate of Pango; on the weſt, the duchy of Batta; and within land, the marquiſate of Pemba. See each reſpectively. The capital of the whole kingdom is Banza, or St. Salvadore, which ſee. Independent of the ſix diſtricts above enumerated, Congo has ſeveral other leſſer provinces, moſt of which are covered with foreſts or mountains, and inhabited by a race of men in a barbarous and ſavage ſtate: their names, as we learn from Cavazzi, are Zuiona, Zujamazondo, Ndamba, Nſuſſo, Nſellajuva, Alombo, Nſolo, Nzanga, Marſinga, and Mortonda; the three laſt of which border upon the country of Ajacoa, a nation more barbarous than any of the reſt.

The kingdom of Congo, like moſt other parts of Africa, breeds a prodigious variety of living creatures, both wild and tame, and particularly thoſe of the former ſort; ſuch as elephants and lions, of a monſtrous ſize, leopards, tygers, wolves, and other voracious animals. The zebra of this country is a beautiful animal, which the natives hunt, on account of its fleſh, which they eſteem a dainty food, and for its hide which they ſend to Europe as a valuable commodity. In this country they have alſo a great abundance of buffaloes and wild aſſes. The "Dante" ſeems peculiar to this country; in ſhape and colour it reſembles an ox, but is not ſo large; its horns are like thoſe of a he-goat, but very ſmooth and ſhining, and of a blackiſh hue, of which the natives make a variety of pretty baubles; the ſkin is commonly bought by the Portugueſe, and ſent into Germany, to be tanned and made into targets, called "Dantes;" and of the raw hide dried, the natives make their ſhields, which are impenetrable to arrows and darts, and ſo large as to cover the whole body. Cameleons ſwarm in Congo; and it has ſeveral ſorts of wild rats, as the ningi, nſoſſi, and maimoni, whoſe furs excel thoſe of the fineſt tygers, in the beauty, variety, and regularity of their ſtreaks and ſpots. The foreſts alſo ſwarm with wild dogs, which are extremely fierce and voracious. It has alſo one ſingular quadruped, which abides conſtantly in the trees, and which is ſaid to die immediately upon ſetting its feet on the ground; it is called "entiengia," and is very ſmall; its ſkin is ſo beautifully ſpotted, that none but the kings of Congo, the princes of the blood, and ſuch nobles as obtain the privilege from him, have the liberty of wearing it. And even the kings of Lovango, Cacongo, and Gay, receive this extraordinary fur, as a valuable preſent.

The tame animals of Congo, ſuch as oxen, ſheep, hogs, horſes, mules, and aſſes, which might be rendered uſeful and profitable, are much neglected. The Portugueſe, however, have directed their attention to the cows, ſheep, and goats, chiefly on account of their milk, though they have not learned to make butter or cheeſe. The land and ſea fowls of this country are very numerous; its oſtriches are very large and beautiful; the feathers of which, mixed with thoſe of peacocks, no leſs numerous and beautiful, are uſed, inſtead of enſigns and ſtandards, and made into umbrellas. Turkies, geeſe, hens, and ducks, both wild and tame, and alſo pheaſants, pigeons, doves, woodcocks, and other ſmaller birds, abound in this country. Of parrots there is a great variety, diſtinguiſhed both by their ſize and colour; the moſt eſteemed of theſe are ſuch as they denominate, by way of excellence, the birds of muſic, which are kept by perſons of rank in cages and aviaries, for the ſake of their ſurpriſing melody. Here are other birds which the ſuperſtitious natives regard with horror; the flight or cry of which throws them into a general panic, and occaſions them to diſperſe with the utmoſt precipitance and confuſion. The moſt dreaded of the ominous kind are crows, ravens, bats, owls, and eſpecially the great owl, which they call, in their language, "kariam pemba," the name they give to the devil. Birds of prey, ſuch as eagles, vultures, falcons of various ſorts, ſparrow-hawks, and others of a ſimilar kind, are found in great numbers. Herons, bitterns, and ſome others of the like voracious kind, commonly abound in their marſhes, lakes, and other waters. Among theſe they have a bird, in ſhape and ſize like a crane, and one in particular, called by the Portugueſe the pelican, of a large ſize and whitiſh colour; and alſo another called the fiſher, which darts from a ſurprizing height in the air on the fiſh which he perceives in the ſea or in rivers. Of fiſh, the ſea adjoining to this country, and its rivers, afford great plenty and variety. The inhabitants are likewiſe infeſted with a great variety of ſerpents, very long and thick, rattle-ſnakes, vipers, and other venomous reptiles, ſcorpions, and other venomous inſects, both flying and reptile, of various kinds, are found in this country. This country is ſaid to poſſeſs mines of ſilver and gold, as well as of iron and copper; but the people are too indolent to work them, or to derive any great advantage from them.

When the Portugueſe firſt diſcovered this country, in the reign of John II., in the year 1484, they found it for the moſt part covered with towns and villages, ſwarming with inhabitants; the cities being well filled with people, and particularly the metropolis, which contained above 50,000 perſons. We may form ſome judgment of the population of the country by this circumſtance, *viz.* that the army of the king of Congo, in the year 1665, conſiſted of no leſs than 900,000 fighting men; and, beſides, the number of converts to Chriſtianity, which a ſmall number of Capuchin friars made among the more civilized ſort, within the ſpace of a few years, is affirmed to have amounted to 600,000. The ſurpriſing fecundity of their women, the hardineſs with which they bring up their children, and the robuſt healthy conſtitution of their men, if we may credit Cavazzi, and the miſſionaries, are ſuch that their villages and hamlets ſo ſwarm with men, women, and children, that a father will exchange one or two of the latter for ſome commodity he wants, or even ſome trifling bauble which he fancies; inſomuch that the number of ſlaves they ſell abroad, doth ſeldom, communibus annis, fall ſhort of 15 or 16 thouſand. Notwithſtanding the indolence and conſequent poverty of the Congoeſe, they entertain the moſt extravagant conceit both of themſelves and of their country; ſo that it is one of the articles of their belief, that the reſt of the world was the work of angels, but that their kingdom of Congo, in its full and ancient extent, was the immediate production of the Supreme Architect himſelf, and muſt of courſe enjoy ſingular advantages and prerogatives above all others; and that their monarchs muſt be the moſt opulent, wiſe, and powerful, and their ſubjects the nobleſt, richeſt, moſt ingenious, and happieſt in the univerſe. They imagine alſo, that the natives who traffic with them are forced to undertake that ſervile employment by their poverty and the ſterility of their reſpective countries, rather than induced to it by their luxury and avarice; whilſt they themſelves, with the utmoſt eaſe and content, can indulge their natural indolence, though attended with hunger and miſery, rather than diſgrace the nobleneſs of their blood by any kind of induſtry; which, however laudable and beneficial, is regarded by them as a leſſer degree of ſlavery. However, ſince the ſettlement of the Portugueſe, they have been rouſed by their example from this kind of fantaſtic pride and ſhameful ſloth into occaſional and partial exertion; in weaving nets, and other coarſe ſtuffs, ſawing of boards, ſeveral branches of carpentry, and other manufactures and trades. But though they think it beneath their dignity to apply to any uſeful work, they deem it no diſgrace to beg and ſteal.

The complexion of the genuine natives, that both of the men and women, is black, but ſome of them are of a deeper dye than others. Since their intermarriages with the Portugueſe, they have varied from their native hue; ſome to a dark brown, ſome to an olive, and others to a blackiſh red. Their hair is black and curled, and in ſome caſes of a dark ſandy; their eyes are generally of a fine lively black, but ſome are of a dark ſea-colour; they have neither flat noſes nor thick lips, like the Nubians and other negroes; their ſtature is moſtly of the middle ſize; and, excepting their black complexion, they much reſemble the Portugueſe, though ſome of them are more fat and fleſhy. In their diſpoſition, they are generally miſtruſtful, jealous, envious, and treacherous, and much inclined to revenge. They are ſo far devoid of natural affection, that a father will ſell his ſon or daughter, and perhaps both, for a piece of cloth, a collar or girdle of coral or beads, and often for a bottle of wine or brandy. A huſband may have as many wives, or if a Chriſtian, as many concubines, as he pleaſes, and repudiate, or even ſell them, though with child, at his pleaſure. The religion of the country, before the Portugueſe introduced their Chriſtianity into it, was, and ſtill is, among the unconverted, a monſtrous compound of idolatry and ſuperſtition, and of the moſt abſurd and deteſtable rites and cuſtoms, invented by their "gangas," or prieſts, for the purpoſe of keeping the people in a ſtate of the moſt abject ſubjection, and cruel tyranny and wretchedneſs. They do, indeed, acknowledge one ſupreme being, called "Nzambiamponga," believed to be all-powerful, and to whom they aſcribe the creation of their country; but they ſuppoſe that he has committed the care and government of all ſublunary things to a great variety of ſubordinate or inferior deities, appointed to preſide over the air, ſea, and earth; lakes and rivers, winds and ſtorms, rain, lightning, drought, heat and cold, men, beaſts, fowls, and fiſhes, trees, fruits, and other productions of nature, fertile and barren, healthy and ſickly ſeaſons. Hence proceeds that immenſe multitude of falſe deities, idols and altars, and that prodigious variety of gangas or prieſts, and ſuperſtitious rites, ſtill found in thoſe parts of the kingdom, where Chriſtianity has not been introduced. Theſe imaginary deities are repreſented under various forms, at the pleaſure of the worſhipper, either of living creatures, as ſerpents, crocodiles, lions, tigers, he-goats, &c. or of trees and plants of different kinds, or of ſtatues and images, ſkilfully carved or painted, ſome of which they worſhip in their houſes, and others in temples of mean conſtruction. Their worſhip conſiſts in genuflexions, proſtrations, fumigations, and other ſuch ſuperſtitious rites; and alſo, agreeably to the injunctions of the gangas, in offerings of their moſt valuable effects, for food, apparel, &c. from which the principal revenue of the gangas is derived, who contrive to ſell the favour of theſe deities at the moſt exorbitant price. Such is the ſuperſtition of the people, and the unbounded influence of theſe gangas, that they will not attempt to build a houſe or hut without conſulting ſome ganga, and putting the edifice under the protection of a deity; nor can the owner take poſſeſſion of it without employing the ganga to make the neceſſary ſacrifices and fumigations, and performing other ceremonies, in order to ſecure that protection. Even the giagas, who are the moſt barbarous people of this kingdom, never venture to begin their harveſt till they have offered various, and even human victims to their gods, and gorged their gangas themſelves with human fleſh. Excepting their new moons, they have no ſet feſtivals or ſeaſons of worſhip, beſides thoſe which the preſident of the gangas appoints, after a victory, a good harveſt, &c. to whom it belongs, to appoint the attendant ſacrifices and rites, to receive the offerings of the people, and to preſcribe the various ceremonies which accompany them. The higheſt power and dignity, pertaining to the prieſtly tribe, are thoſe which are veſted in the "ſhalome" or "chalombe," whom the people reverence as a kind of deity, and to whoſe rank and office various privileges belong. The influence of the gangas is ſo extenſive and ſo powerful, that the kings of Congo, though deſirous of extirpating idolatry from their dominions, have been unable to effect it. With regard to the eſtabliſhment of Chriſtianity in the kingdom of Congo, the firſt preachers commiſſioned by the court of Portugal for this purpoſe, were prieſts and monks of the church of Rome; ſo that the Romiſh religion became the eſtabliſhed religion of all the conquered provinces of the kingdom. But Chriſtianity, even under that form of it, has been ſo much neglected, that in the greater part of theſe extenſive dominions, nothing now remains but the mere name of Chriſtian. It is ſaid, indeed, that the catholics in the duchy of Sogno, are better Chriſtians than others, as they pay a peculiar regard to the external forms of the popiſh worſhip. The princes of this province, as well as thoſe of Bamba and Pemba, have always diſtinguiſhed themſelves by their zeal for the Chriſtian religion, under that external mode of it in which they have been inſtructed; and they have been careful to preſerve their reſpective governments from being corrupted by the heatheniſh gangas or prieſts; and if any ſuch are ever found within their dominions, they are treated with a ſeverity, which prevents their attempting to repeat their viſits.

The government of Congo is monarchical and deſpotic. The kings are the ſole proprietors of all the lands within their dominions; which they parcel out to individuals on condition of a certain tribute and of the performance of particular ſervices. The tribute is ordered to be brought in once in three years at the fartheſt; and the rigorous demand of it is the cauſe of many cruel extortions, which often terminate in a revolt, or open rebellion. The crown is partly hereditary, and partly elective, ſo that no candidate can be choſen, unleſs he be of the royal blood; and ſince the introduction of Chriſtianity, a Chriſtian of the church of Rome. The whole proceſs of his coronation and his mode of living after his advancement to the throne are attended with various circumſtances of ſplendour and magnificence. Whenever he goes abroad, which is ſeldom the caſe, he is attended by a numerous guard, conſiſting of Anſiki (See ANSIKO), and ſome others of neighbouring nations in whom he repoſes the greateſt confidence, muſicians, knights of the holy croſs, (an order inſtituted by the firſt Chriſtian king of Congo) and a number of officers, richly accoutred. The reſpect that is paid him approaches to idolatry. His court is numerous and brilliant; and the royal palace is ſpacious, grand, and commodious. His ſeraglio, in which he keeps a great number of concubines, though he is allowed only one wife, is a kind of priſon; as the women that enter it are confined during the remainder of their lives. His lawful wife preſides in the ſeraglio over all the other women; who indulge themſelves in the moſt licentious gratifications. The royal revenue conſiſts chiefly in the tribute that is paid him by ſeveral vaſſal princes; free-will offerings, in acknowledgment of the lands which are held under him; the property of all the zimbis, or cockle-ſhells, that conſtitute the current coin of this and other neighbouring kingdoms; mines of ſilver and gold, which, however, are much neglected; and the renewal of fiefs and inveſtiture, fines and confiſcations. He has alſo the prerogative of levying taxes upon his ſubjects whenever he pleaſes. His ſtanding forces are neither numerous, nor well-diſciplined, and very badly armed and clothed. Their mode of fighting is tumultuous and ferocious, nor do they give any quarter. Thoſe that are taken alive are hurried to the ſea-ſide, or to ſome inland market, where they are ſold for ſlaves to the Europeans. The funeral obſequies of the monarchs of Congo before they were converted to Chriſtianity, conſiſted of various kinds of ſacrifices and ſuperſtitious ceremonies, accompanied with muſic, howling, dancing, and feaſting, which laſted a whole week, and were reſumed once a year, on the anniverſary of the king's demiſe. It was alſo the cuſtom to bury alive a certain number, nor exceeding twelve, of his favourite concubines, or young ladies belonging to his court; but Chriſtianity has aboliſhed this inhuman cuſtom, though it has not ſuppreſſed the drunken revels that take place on this occaſion.

It is conſidered as a great crime and liable to puniſhment on conviction to ſhed tears even for the king. But certain perſons are kept in pay to go to all the public places of the city or town, to remind the ſubjects of his death by the mournful ſound of their ivory cornets. The princes and nobles are interred in wainſcotted vaults hung with black; and two of their old domeſtics deſtined alternately to guard the entrance, and to pray for the deceaſed. Other prayers are to be offered on the anniverſary of their deceaſe, and on All-ſouls day, at which times their graves are opened, and the hangings exchanged for new ones. The giagas dance about the graves of the deceaſed in a frantic manner, and bring them victuals, drink, and other conveniences. The dances that are performed at the funeral of their great men laſt eight whole days, without intermiſſion: and upon theſe occaſions, they never fail ſacrificing a number of human victims, the fleſh of which they devour with peculiar reliſh. Mourners of the common claſs ſhave their whole heads, and anoint themſelves with oil, upon which they rub ſuch a quantity of earth and duſt, and dried leaves, as to give them a ſhocking appearance. Thoſe of higher ranks ſhave only the upper part of their heads and bind it with a liſt of cloth, linen, or leather, and confine themſelves to the houſe for eight whole days. The Congoeſe conceive concerning dying perſons that they are juſt paſſing from a wretched life into a ſtate of tranquillity and happineſs; and therefore they think they cannot act a kinder part than to accelerate their deliverance. Among the vulgar this notion leads to the barbarous practice of ſtopping the mouth and noſe of a dying perſon, and thumping upon the breaſt with violence, that he may the ſooner paſs into a ſtate of felicity.

The Congoeſe have no written laws; but cuſtom and tradition ſerve them inſtead of a code and commentaries, unleſs favour or bribery interpoſe. Every province has a chief juſtice for civil and criminal affairs from whom an appeal may be made to the king; and under him are inferior officers in every town and community. Three offences, *viz.* treaſon, murder, and ſorcery, are deemed capital; and the two firſt are puniſhed with decollation, and the latter by being burned alive. The puniſhments of leſſer offences are the baſtonade, hanging, fines, and impriſonment.

The traffic of the Congoeſe with the Europeans conſiſts chiefly in ſlaves, and St. Salvadore is the principal mart of the country. The traders who reſide in this place bring thither the products of Braſil, ſuch as grain, fruit, plants, and other proviſions, and the manufactures of Europe, which are uſually Turkey carpets, Engliſh cloth, and other ſtuffs; copper and braſs veſſels, blue earthen ware, rings, and ornaments of gold, ſilver, and baſe metals, coral, glaſs beads, bugles, and other trinkets; tobacco, wine, brandy, and other ſpirituous liquors; light ſtuffs made of cotton, linen, and woollen, for cloathing; and a great variety of tools and utenſils. In return they carry off a number of ſlaves, amounting annually to 15 or 16,000. Slaves indeed are employed at home in all their laborious occupations, and are reckoned the moſt valuable commodities, which a man poſſeſſes or is able to bequeath to his children or relations. Among the Congoeſe every kind of manufacture is in a very imperfect ſtate. The roads through different parts indicate the inattention and indolence both of the government and the people, as they are either extremely bad in themſelves or infeſted with banditti, and a variety of pernicious animals.

The houſes of the Congoeſe are low, ill-built huts, thatched with ſtraw or fern, without windows and with doors ſo low, that the ſhorteſt man is obliged to ſtoop when he enters them. They are ſo ſlightly built, as to be liable to be blown away by a guſt of wind. Thoſe, however, belonging to the Portugueſe are built of brick and mortar, and generally well-furniſhed and adorned. The furniture of the Congoeſe houſes conſiſts chiefly of ſome few ill-contrived inſtruments for agriculture, a hatchet to fell timber, a cutlaſs for travelling or for war, ſome few calabaſhes for containing their proviſions, a pot, kettle, and ladle, a few earthen platters, and a hand-mill for grinding their corn. Their beſt bedding is a large coarſe ſackcloth, filled with ſtraw or leaves, with a ſlight covering, and perhaps a log of wood inſtead of a pillow. But the Portugueſe have introduced

troduced among the ſuperior claſſes, and particularly in the palaces of the princes and viceroys, various articles of luxury.

Polygamy was univerſally allowed in Congo before the introduction of Chriſtianity; and ſince that period, the miſſionaries have in vain endeavoured to perſuade the inhabitants to be contented, each of them, with one wife. Previous to marriage the perſon is allowed three years trial; and when this term is expired, the prieſt performs the ceremony, and the ſtipulated dowry is paid. This ceremony is preceded by a ſumptuous banquet, and dancing and drinking are continued till the next morning, when the parties retire.

The muſical inſtruments, now uſed by the Congoeſe, are ſuch as the Portugueſe have introduced; ſuch as the trumpet, cornet, French-horn, and fife; but the common people are contented with their fifes and tabors at their weddings and other rejoicings. They have alſo ſtringed inſtruments, which by their rude conſtruction ſeem to be natives of the country; ſuch are their "nſambi," reſembling the Spaniſh guitar, and the "marimba," conſiſting of fifteen or ſixteen ſmall calabaſhes, of different ſizes, faſtened to a flat board by ſtrings that paſs acroſs their mouths, and which, being touched by ſmall pieces of wood, like the ſticks of our dulcimers, yield an agreeable variety of ſounds. Their drums are made of a long hollow trunk of a tree, with a ſingle ſkin ſtretched over one end of it, the other being left open; they are beat either with the fiſts, or by ſticks of heavy wood, and are uſed at their feſtivals as well as in the army; they are called "ngambo" or "ingombo," and give but a dull heavy ſound, which is raiſed either by that of the fife, or the "longa," which conſiſts of two or more ſmall bells. The dancing of the Congoeſe conſiſts in a promiſcuous round of men and women, all ſtriving who ſhall ſhew the greateſt agility and variety of gambols, contortions, and indecent poſtures.

The hiſtory of the foundation of the monarchy of Congo is uncertain and fabulous. It is aſcribed to the ſon of a neighbouring prince, whoſe ſmall territory was ſituate on the banks of the Zair, in the province of Corimba. The name of the young prince was Luqueni, who ſubdued the whole province of "Npemlacaſſi," ſince called Congo, and extended his conqueſts from the mouth of the Zair to the city of St. Salvadore. His ſucceſſors, it is ſaid, have maintained themſelves on the throne ever ſince his time. This country was diſcovered by the Portugueſe in the reign of king John II., who employed Diego Cam, a perſon of enterpriſe and a famous navigator, in an expedition for making diſcoveries on the coaſts of Ethiopia. Cam, on his arrival near theſe coaſts in the year 1484, fell inſenſibly upon the rapid ſtream of the river Zair, as he was endeavouring to double the cape Catalina; and having caſt anchor at its mouth, he explored the country ſituated on its banks, and was well received by the inhabitants, who conducted four or five of his officers to St. Salvadore. Before their return, he determined to ſet ſail for Portugal, and took with him four of the natives. King John was ſo pleaſed with the account which he received of the country, that he ordered Cam to return with his companions as ſpeedily as poſſible, and furniſhed him with valuable preſents for the king and his court. He charged him, moreover, to exhort the monarch of Congo, in his name, to become a convert to the worſhip of the only true God, and to permit the Chriſtian religion to be propagated through his dominions. Cam, in the year 1485, arrived at Congo, and was very favourably received. No time was loſt in eſtabliſhing an alliance between the two crowns of Portugal and Congo, which has continued to ſubſiſt, though often ſuſpended by intervening wars. This alliance was followed by the converſion of the king to the Chriſtian faith. For a further account of the hereditary ſovereigns of Congo, too minute in detail to be introduced into our work, and too unintereſting at this remote period for abridgment, we refer to the "Modern Univerſal Hiſtory," vol. xiii.

Congo *money*, or *Guinea money*, a name given to a peculiar ſpecies of *concha veneris*, or porcelain-ſhell, which paſſes by way of money among the natives of thoſe places. It is diſtinguiſhed from the other porcelains by having a dentated mouth, and ſix gibbous protuberances on its ſurface.

Congo *Tea*, in *Commerce*. See Tea.

CONGORLAN, a town of Perſia, in the province of Irak; 75 miles N.N.E. of Amadan.

CONGOU, in *Geography*, a town of Perſia, ſituated on the eaſtern ſide of the Perſian Gulf. N. lat. 28°. E. long. 52°.

CONGRATULATION, denotes the immediate expreſſion of our joy, on account of any favourable event that has occurred in any of our connections.

CONGREGATION, an aſſembly of ſeveral eccleſiaſtics, united ſo as to conſtitute a body.

The term is principally uſed for aſſemblies of cardinals, appointed by the pope, and diſtributed into ſeveral chambers, for the diſcharge of certain functions and juriſdictions, after the manner of our offices and courts. The deciſions of theſe ſocieties are generally ſanctioned by the approbation of the Roman pontif, who has not a right, without alleging the moſt weighty and evident reaſons, to reverſe what they pronounce to be juſt and expedient. This form of eccleſiaſtical government is, without doubt, a check to the authority of the pope; and hence it is, that many things are tranſacted at Rome in a manner that is in direct oppoſition to the ſentiments of its ſpiritual ruler. This may ſerve to correct a miſtaken notion concerning the nature and limits of the papal hierarchy maintained by thoſe, who pretend, that all the iniquitous proceedings of the court of Rome, the calamities it has occaſioned, the contentions, rebellions, and tumults it has excited, are to be wholly laid to the charge of the Roman pontif. Hence alſo ariſes that important diſtinction that has been frequently employed by the French and other nations in their debates with the Roman pontif, that is, the diſtinction between "the pope of Rome," and "the court of Rome." The one is often loaded with the bittereſt reproaches and the heavieſt accuſations, while the other is ſpared, and in ſome meaſure excuſed. Nor is this diſtinction by any means groundleſs; ſince the cardinals and congregations, whoſe rights and privileges are held ſacred, undertake and execute many projects without the knowledge, and ſometimes againſt the will and conſent, of the Roman pontif.

The principal congregations of cardinals are theſe: 1. "The congregation of the Pope," inſtituted firſt by Sixtus V., to prepare the matters that were to be brought before the conſiſtory, at which the pope is always preſent. Hence this is called the "conſiſtorial congregation," and in it are treated all affairs relative to the creation of biſhops and cathedral churches, the reunion or ſuppreſſion of epiſcopal ſees, the alienation of church goods, and the taxes and annates that are impoſed upon all benefices in the pope's gift. The cardinal-dean preſides in this aſſembly. 2. "The congregation of the Inquiſition," or, as it is otherwiſe called, "of the holy office," inſtituted by Paul III., or, as others ſay, by Pius IV., and reformed by Pius VI., which takes cognizance of hereſies, apoſtacy, magic, and profane writings,

ings, aſſembling thrice in the week, and every Thurſday in preſence of the pope, who preſides in it. This congregation conſiſts of at leaſt 12 cardinals, with ſeveral other prelates and divines of different orders, who were called conſultors of the holy office. The office of grand inquiſitor, which encroached upon the prerogatives of the pontif, has been long ſuppreſſed, or rather diſtributed among the cardinals who belong to this congregation, and whoſe deciſions come under the ſupreme cognizance of his holineſs. See INQUISITION. 3. “The congregation for the propagation of the Roman Catholic faith,” founded under the pontificate of Gregory XV., and compoſed, (ſays the tranſlator of Moſheim's Eccl. Hiſt.), of 18 cardinals, one of the ſecretaries of ſtate, a prothonotary, a ſecretary of the inquiſition, and other inferior members. (See COLLEGE *de propaganda fide*). In this congregation are carried on the deliberations which relate to the extirpation of hereſy, the appointment of miſſionaries, &c.; this congregation has built a moſt beautiful and magnificent palace in one of the moſt agreeable ſituations that could be choſen at Rome, where proſelytes to popery from foreign countries are lodged and maintained gratis in a manner ſuitable to their rank and condition, and inſtructed in thoſe branches of knowledge to which their genius inclines. The prelates, vicars, and curates, who are obliged, without any fault on their own part, to abandon the places of their reſidence, are entertained charitably in this noble edifice, in a manner correſponding to their rank in the church. 4. “The congregation deſigned to explain the deciſions of the council of Trent.” 5. “The congregation of the Index,” whoſe principal buſineſs is to examine MSS. and books that are deſigned for publication, to decide whether the people may be permitted to read them, to correct thoſe books whoſe errors are not numerous, and which contain uſeful and ſalutary truths, to condemn thoſe whoſe principles are heretical and pernicious, and to grant the peculiar privilege of peruſing heretical books to certain perſons. This congregation, which is ſometimes held in the preſence of the pope, but generally in the palace of the cardinal-preſident, has a more extenſive juriſdiction than that of the inquiſition, as it not only takes cognizance of thoſe books that contain doctrines contrary to the Roman Catholic faith, but of thoſe alſo that concern the duties of morality, the diſcipline of the church, and the intereſts of ſociety. Its name is derived from the alphabetical tables, or indexes, of heretical books and authors, which have been compoſed by its appointment. 6. “The congregation for maintaining the rights and immunities of the clergy, and of the knights of Malta.” This congregation was formed by Urban VIII., to decide the diſputes and remove the difficulties and inconveniencies that aroſe from the trials of eccleſiaſtics before princes, or other lay-judges. 7. “The congregation relating to the Biſhops and regular Clergy,” inſtituted by Sixtus V., to decide the debates which ariſe between the biſhops and their dioceſans, and to compoſe the differences that happened ſo frequently among the Monaſtic orders. 8. “The congregation,” appointed by Gregory XIV., for examining into the capacity and learning of the biſhops. 9. “Another,” for inquiring into their lives and morals. 10. “A third,” for obliging them to reſide in their dioceſes, or to diſpenſe with that obligation. 11. “The congregation for ſuppreſſing monaſteries,” *i. e.* ſuch whoſe revenues are exhauſted, and which thereby become a charge upon the public. 12. “The congregation of the Apoſtolic Viſitation,” which names the viſitors who perform the duties and viſitations of the churches and convents within the diſtrict of Rome, to which the pope is obliged, as archbiſhop of that city. 13. “The congregation of Relics,” deſigned to examine the marks, and to augment the number of theſe inſtruments of ſuperſtition. 14. “The congregation of Indulgences,” deſigned to examine the caſe of thoſe who have recourſe to this method of quieting the conſcience. 15. “The congregation of Rites,” appointed by Sixtus V., to regulate and invent the religious ceremonies that are to be obſerved in the worſhip of each new ſaint that is added to the kalendar. Such are the congregations of cardinals, ſet apart for adminiſtering the ſpiritual affairs of the church; and they are undoubtedly, in ſome reſpects, a check upon the power of the pontif, enormous as it may be. There are ſix more, which relate to the temporal government of the papal territories. In theſe congregations, where the pope is never preſent, all things are tranſacted which relate to the execution of public juſtice in civil or criminal matters, the levying of taxes, the providing of good governors for the cities and provinces, the relief of thoſe who are unjuſtly oppreſſed by ſubordinate magiſtrates, the coinage, the care of the rivers, aqueducts, bridges, roads, churches, and public edifices.

CONGREGATION is alſo uſed for a company or ſociety of religious cantoned out of this or that order; and making, as it were, an inferior order, or a ſubdiviſion of the order itſelf. Such are the congregations of the Oratory, and thoſe of Cluny, &c. among the Benedictines.

The word is alſo uſed for aſſemblies of pious perſons, in manner of fraternities; frequent among the Jeſuits in honour of the Virgin, &c.

CONGREGATION *of Aids*, or *de Auxiliis*, was eſtabliſhed in conſequence of a diſpute between the Dominicans and Jeſuits. The former had long cheriſhed a deep rooted and invincible hatred againſt the latter; and having a favourable opportunity of venting their indignation, exhauſted their furious zeal againſt the doctrine of Molina, notwithſtanding the pacific orders of the papal edict, iſſued by Clement VIII., in the year 1594. They inceſſantly wearied the Spaniſh monarch, Philip II., and the Roman pontif, Clement VIII., with their importunate clamours, till at length the latter found himſelf under a neceſſity of aſſembling at Rome a ſort of council for the deciſion of this controverſy. Thus commenced, about the year 1598, thoſe famous deliberations concerning the conteſt of the Jeſuits and Dominicans, which were held in the congregation of aids. This congregation was ſo denominated on account of the principal point in debate, which was the efficacy of the aids and ſuccours of divine grace; and its conſultations were directed by Lewis Madruſi, biſhop of Trent, and one of the college of cardinals, who ſat as preſident in this aſſembly, which was compoſed beſides of three biſhops and ſeven divines, choſen out of ſo many different orders. The hiſtory and tranſactions of this congregation are related and illuſtrated by ſeveral writers of different complexions, by Jeſuits, Dominicans, and Janſeniſts. After all it is ſtill a matter of doubt, which party was moſt favoured by the court of Rome on this occaſion, the Jeſuits or the Dominicans, and which of theſe two parties defended their cauſe with the greateſt dexterity and ſucceſs.

CONGREGATION *of the Immaculate Conception*. See IMMACULATE.

CONGREGATION *of the Lateran*. See LATERAN.

CONGREGATION *of the Lord*, in *Eccleſiaſtical Hiſtory*, an aſſociation of reformers in Scotland, formed in the year 1557 by the earl of Argyle, his ſon lord Lorne, the earl of Morton and Glencarne, Erſkine of Dun, and others, who, obſerving the danger to which they were expoſed, and deſirous of propagating their principles, entered privately into a bond or aſſociation; and aſſumed this appellation

Strahan and Preſton,
New-ſtreet Square, London.

lation; in contradiſtinction to the eſtabliſhed church, which they denominated the congregation of Satan. Supported by the authority, which, they thought, belonged to them under the denomination they aſſumed, they ordained that prayer in the vulgar tongue ſhould be uſed in all the pariſh-churches of the kingdom; and that preaching, and the interpretation of the Scriptures, ſhould be practiſed in private houſes, till God ſhould move the prince to grant public preaching by faithful and true miniſters. This congregation, encouraged by ſome favourable appearances which occurred, proceeded with alacrity in openly ſoliciting ſubſcriptions to their league; and the death of Mary of England, with the acceſſion of Elizabeth, which happened about this time, contributed to increaſe their hopes of ultimate ſucceſs in their undertaking. They ventured to preſent a petition to the regent, craving a reformation in the church, and of the wicked, ſcandalous, and deteſtable lives of the prelates and eccleſiaſtics. They alſo framed a petition, which they intended to preſent to parliament, in which, after premiſing that they ſhould not communicate with the damnable idolatry, and intolerable abuſes of the papiſtical church, they deſired that the laws againſt heretics ſhould be executed by the civil magiſtrate alone, and that the Scripture ſhould be the ſole rule in judging of hereſy. They even petitioned the convocation, and inſiſted, that prayers ſhould be ſaid in the vulgar tongue, and that biſhops ſhould be choſen with the conſent of the gentry of the dioceſe, and prieſts with the conſent of the pariſhioners. The regent prudently temporized between theſe parties; but after ſome time, ſhe proceeded with greater rigour againſt the reformers, and the diſpute terminated in a civil war. At length the covenant was ſubſcribed by the reformers, who committed themſelves to the guidance of John Knox. The conſequence was, that the Catholic religion was ſuppreſſed, and the preſbyterian diſcipline eſtabliſhed. See REFORMATION.

CONGREGATION *of Miſſion.* See MISSION.

CONGREGATION *of Penitence.* See PENITENCE.

CONGREGATION *of Holy Sacrament.* See SACRAMENT.

CONGREGATION *of Holy Trinity.* See TRINITY.

CONGREGATION, in *Phyſics*, is uſed by Dr. Grew for the leaſt and loweſt degree of mixtion; or that wherein the parts of the mixt do not conſiſt with, or adhere to, each other, but only touch in one point. That author declares himſelf of opinion, that the particles of all *fluids* only touch in this manner; or that their coheſion only amounts to a *congregation*. See FLUID.

CONGREGATION alſo denotes an aſſembly of perſons in ſocial and public worſhip.

CONGREGATIONALISTS. See INDEPENDENTS.

CONGRESS, CONGRESSUS, is uſed for an aſſembly of commiſſioners, deputies, envoys, &c. from ſeveral courts or provinces, meeting to ſettle terms for a general pacification or to concert meaſures for their common good.

The congreſs at the Hague, while held during the courſe of the war, terminated in 1697, by the treaty of Ryſwick, was compoſed of the envoys of all the princes in the confederacy againſt France.

CONGRESS, in *Modern Hiſtory*, denotes that body, in which, by the conſtitution of the United States of America, all legiſlative powers are veſted. It conſiſts of a ſenate and houſe of repreſentatives. The houſe of repreſentatives is compoſed of members choſen every ſecond year by the people of the ſeveral ſtates; and the electors in each ſtate ſhall have the qualifications requiſite for electors of the moſt numerous branch of the ſtate legiſlature. No perſon ſhall be a repreſentative under the age of 25 years, who has not been ſeven years a citizen of the United States, and who ſhall not, when elected, be an inhabitant of the ſtate in which he ſhall be choſen. The number of repreſentatives, apportioned among the ſeveral ſtates, which may be included within this union, according to their reſpective numbers, to be aſcertained by actual enumeration within three years after the firſt meeting of congreſs, and within every ſubſequent term of ten years, ſhall not exceed one for every thirty thouſand; but each ſtate ſhall have at leaſt one repreſentative. In caſe of vacancy in the repreſentation of any ſtate, writs ſhall be iſſued by the executive authority for filling ſuch vacancies. The houſe of repreſentatives chuſe their ſpeaker, and other officers, and have the ſole power of impeachment.

The ſenate of the United States is compoſed of two ſenators from each ſtate, choſen by its legiſlature for ſix years; and each ſenator has one vote. The ſenators are divided into three claſſes; the ſeats of thoſe of the firſt claſs being vacated at the expiration of the ſecond year; of the ſecond claſs at the expiration of the fourth year; and of the third claſs at the expiration of the ſixth year; ſo that one-third may be choſen every ſecond year.

No perſon ſhall be a ſenator, under the age of 30 years; after being nine years a citizen of the United States, and who is not, when elected, an inhabitant of the ſtate for which he is choſen. The vice-preſident of the United States is preſident of the Senate, but has no vote, unleſs the votes be equally divided. The ſenate chuſes its other officers, and alſo a preſident pro tempore, in the abſence of the vice-preſident, or when he ſhall exerciſe the office of preſident of the United States. The ſenate has the ſole power to try all impeachments; and no perſon ſhall be convicted without the concurrence of two-thirds of the members preſent.

The congreſs ſhall aſſemble at leaſt once in every year, and ſuch meeting ſhall be on the firſt Monday in December, unleſs they ſhall, by law, appoint a different day. Each houſe has its peculiar powers; but neither houſe, during the ſeſſion of congreſs, ſhall, without the conſent of the other, adjourn for more than three days, nor to any other place than that in which the two houſes ſhall be ſitting. The ſenators and repreſentatives ſhall receive a compenſation for their ſervices, aſcertainable by law, and payable out of the treaſury of the United States. They are, in all caſes, except treaſon, felony, and breach of the peace, privileged from arreſt during their attendance at the ſeſſion of their reſpective houſes, and in going to, and returning from, them; and for any ſpeech or debate in either houſe, they are not to be queſtioned in any other place. No ſenator or repreſentative ſhall, during the time for which he was elected, be appointed to any civil office under the authority of the United States, which ſhall have been created, or the emoluments of which ſhall have been increaſed, during ſuch time; and no perſon holding any office under the United States ſhall be a member of either houſe, during his continuance in office.

All bills for raiſing revenue ſhall originate in the houſe of repreſentatives; but the ſenate may propoſe or concur with amendments, as on other bills. Every bill, which ſhall have paſſed the houſe of repreſentatives, and the ſenate, ſhall, before it become a law, be preſented to the preſident of the United States; if he approve, he ſhall ſign it; but if not, he ſhall return it, with his objections, to that houſe in which it has originated, who, having entered the objections on their journal, ſhall proceed to reconſider it. If, after reconſideration, two-thirds of that houſe ſhall agree to paſs the bill, it ſhall be ſent, together with the objections, to the other houſe, by which it ſhall likewiſe be reconſidered, and, if approved by two-thirds of that houſe, it ſhall become a law. In ſuch caſe the votes of both houſes ſhall be determined by yeas and nays, and the names of the perſons voting for and againſt the bill ſhall be entered on the journal of each houſe, reſpectively. If any bill ſhall not be returned by the preſident within ten days (Sundays excepted) after it has been preſented to him, the ſame ſhall be a law, as if he had ſigned it, unleſs the congreſs, by their adjournment, prevent its return, in which caſe it ſhall not be a law. Every order, reſolution, or vote, to which the concurrence of the ſenate and houſe of repreſentatives may be neceſſary, ſhall be ſubject to the ſame rules and limitations as are preſcribed in the caſe of a bill.

By the conſtitution the congreſs ſhall have power—to lay and collect taxes, duties, impoſts, and exciſes—to pay the debts and provide for the common defence and general welfare of the United States—to borrow money on the credit of the United States—to regulate commerce with foreign nations, among the ſeveral ſtates, and with the Indian tribes—to eſtabliſh an uniform rule of naturalization, and uniform laws on the ſubject of bankruptcies, throughout the United States—to coin money, regulate its value, and that of foreign coin, and to fix the ſtandard of weights and meaſures—to provide for the puniſhment of counterfeiting the ſecurities and current coin of the United States—to eſtabliſh poſt offices and poſt-roads—to promote the progreſs of ſcience and uſeful arts, by ſecuring for limited times, to authors, and inventors, the excluſive right to their reſpective writings and diſcoveries—to conſtitute tribunals inferior to the ſupreme court—to define and puniſh piracies and felonies committed on the high ſeas, and offences againſt the law of nations—to declare war, grant letters of marque and repriſal, and make rules concerning captures on land and water—to raiſe and ſupport armies, but without appropriating money to that uſe for a longer term than two years—to provide and maintain a navy—to make rules for the government and regulation of the land and naval forces—to provide for calling forth the militia to execute the laws of the Union, ſuppreſs inſurrections, and repel invaſions—to provide for organizing, arming, and diſciplining the militia, &c. reſerving to the ſtates, reſpectively, the appointment of the officers, and the authority of training the militia, according to the diſcipline preſcribed by congreſs—to exerciſe excluſive legiſlation, in all caſes whatſoever over ſuch diſtrict, (not exceeding ten miles ſquare) as may, by ceſſion of particular ſtates, and the acceptance of congreſs, become the ſeat of the government of the United States, and to exerciſe like authority over all places, purchaſed by conſent of the legiſlature of the ſtate in which the ſame ſhall be, for the erection of forts, magazines, arſenals, dock-yards, and other needful buildings—and to make all laws which ſhall be neceſſary and proper for carrying into execution the foregoing powers, and all other powers veſted by this conſtitution in the government of the United States, or in any department or officer thereof.

The powers of congreſs, however, are ſubject to certain limitations; *e. g.* the privilege of the writ of habeas corpus ſhall not be ſuſpended, unleſs the public ſafety requires it in caſes of rebellion or invaſion. No bill of attainder, or ex poſt facto law, ſhall be paſſed. No capitation, or other direct tax, ſhall be levied, unleſs in proportion to the cenſus, or enumeration, herein before directed to be taken.—No tax or duty ſhall be laid on articles exported from any ſtate—no preference ſhall be given by any regulation of commerce or revenue, to the ports of one ſtate over thoſe of another—nor ſhall veſſels bound to or from one ſtate be obliged to enter, clear, or pay duties, in another—no money ſhall be drawn from the treaſury, but in conſequence of appropriations made by law; and a regular ſtatement and account of the receipts and expenditures of all public money ſhall be publiſhed from time to time. No title of nobility ſhall be granted by the United States; and no perſon holding any office of profit or truſt under them ſhall, without the conſent of the congreſs, accept of any preſent, emolument, office, or title, of any kind whatever, from any king, prince, or foreign ſtate. With regard to individual ſtates it is provided, that no ſtate ſhall enter into any treaty, alliance, or confederation; grant letters of marque and repriſal; coin money; emit bills of credit; make any thing but gold and ſilver coin a tender in payment of debts; paſs any bill of attainder, ex poſt facto law, or law impairing the obligation of contracts; or grant any title of nobility. Moreover, no ſtate ſhall, without the conſent of the congreſs, lay any impoſts or duties on imports or exports, except what may be abſolutely neceſſary for executing its inſpection laws; and the net produce of all duties and impoſts, laid by any ſtate on imports or exports, ſhall be for the uſe of the treaſury of the United States; and all ſuch laws ſhall be ſubject to the reviſion and control of the congreſs. No ſtate ſhall, without the conſent of congreſs, lay any duty of tonnage, keep troops or ſhips of war in time of peace, enter into any agreement or compact with another ſtate, or with a foreign power, or engage in war, unleſs actually invaded, or in ſuch imminent danger as will not admit of delay. The congreſs, under certain limitations, whenever two-thirds of both houſes ſhall deem it neceſſary, may propoſe amendments to the conſtitution, eſtabliſhed Sept. 17, 1787; or, on the application of the legiſlature of two-thirds of the ſeveral ſtates, ſhall call a convention for propoſing amendments, which, in either caſe, ſhall be valid, to all intents and purpoſes, as part of the conſtitution, when ratified by the legiſlatures of three-fourths of the ſeveral ſtates, or by conventions in three-fourths thereof, as the one or the other mode of ratification may be propoſed by the congreſs. The ſenators and repreſentatives before-mentioned, and the members of the ſeveral ſtate legiſlatures, and all executive and judicial officers, both of the United States, and of the ſeveral ſtates, ſhall be bound by oath or affirmation, to ſupport the conſtitution; but no religious teſt ſhall ever be required as a qualification to any office, or public truſt, under the United States. The executive power is veſted by the conſtitution in a preſident of the United States of America. See PRESIDENT.

CONGRESS, in *Law*, is alſo uſed for an eſſay, or trial, made by appointment of a lay, or ſpiritual judge, in the preſence of ſurgeons and matrons, to prove, whether or no a man be or be not impotent; in order to the diſſolution of a marriage. See IMPOTENCE.

Neither the civil nor canon law make any mention of this trial of virility by congreſs; it had its origin in France, from the boldneſs of a young fellow, who, in open court, being hard preſſed by his wife, demanded the congreſs. The judge, ſurpriſed with the novelty of the demand, found it could not be denied; as being the ſureſt evidence the caſe could admit of.

In time it became a branch in the French juriſprudence, and was authorized by decrees and arrets: it obtained for about the ſpace of one hundred and twenty years, and was annulled by an arret of parliament in 1677, as being found precarious; ſome having failed under the experiment out of mere modeſty and ſhame, which is found to have the ſame effect with actual impotency.

CONGREVE,

CONGREVE, William, in *Biography*, a celebrated Engliſh dramatic writer, deſcended from an ancient family in Staffordſhire, which traces its lineage beyond the Norman conqueſt. Neither the time nor the place of his birth can be aſcertained with any degree of preciſion; according to the inſcription on his monument, it was in the year 1672, and he himſelf declares that he owed his nativity to England; though by many of his biographers it has been aſſerted that he was born in Ireland. Wherever he was born, it is known that he was educated, firſt at Kilkenny, and afterwards at Dublin, his father having ſome military employment that ſtationed him in Ireland. After he had paſſed the uſual preparatory ſtudies, he was ſent, at the age of ſixteen, to ſtudy the law in the Middle Temple. For this his genius does not appear to have been adapted: he looked, at a very early period of life, to polite literature as that by which he might be diſtinguiſhed. By a feigned name he publiſhed the "Incognita, or Love and Duty reconciled," a novel, which has been characterized as ſprightly in dialogue, intricate in plot, and unnatural; and Dr. Johnſon ſays "he would rather praiſe than read it." As a dramatic writer, Congreve's firſt piece was the "Old Bachelor," written at the age of twenty, and, according to the author's own account, to amuſe himſelf in a ſlow recovery from a fit of ſickneſs; but which was regarded by Dryden, and others who were his contemporaries, as a very wonderful performance. Its ſucceſs was very great; few plays have been ſo beneficial to the writer, for it procured him the patronage of the earl of Halifax, who was the Mæcenas of the day, and who deſerves the praiſe of having beſtowed more public patronage on the muſes than they have ever received before, or perhaps ſince, in this country. Upon Congreve the noble lord beſtowed the office of commiſſioner for licenſing coaches; and ſoon after gave him a place in the pipe-office, and another in the cuſtoms of 600*l.* per annum.

If the Old Bachelor be nearly examined, ſays Dr. Johnſon, "it will be found to be one of thoſe comedies which may be made by a mind vigorous and acute, and furniſhed with comic characters by the peruſal of other poets, without much actual commerce with mankind. The dialogue is one conſtant reciprocation of conceits, or claſh of wit, in which nothing flows neceſſarily from the occaſion, or is dictated by nature. The characters both of men and women are either fictitious or artificial; and the cataſtrophe ariſes from a miſtake not very probably produced, by marrying a woman in a maſk. Yet this gay comedy, when all theſe deductions are made, will ſtill remain the work of very powerful and fertile faculties; the dialogue is quick and ſparkling, the incidents ſuch as ſeize the attention, and the wit ſo exuberant that, it "o'er-informs its tenement."

Congreve's next play was "The Double Dealer," which was not received with equal kindneſs by the public, but which was honoured with the patronage of the queen, on whoſe death he wrote a poetical tribute to her memory; in which, ſays his biographer, "all is unnatural, and yet nothing is new." In the year 1695, his prolific pen produced "Love for Love," a comedy of nearer alliance to life, and exhibiting more real manners, than either of the former. This proved a very popular and profitable piece: and in the ſame year he publiſhed an irregular ode to king William, on the taking of Namur; which exhibited leſs of the powers of poetry, than of the ſpirit of loyalty. With the comedy of Love for Love, the new theatre was opened, under the direction of Betterton the tragedian; where, in 1697, was exhibited "The Mourning Bride," a tragedy, ſo written, as to ſhew that the author was ſufficiently qualified for either kind of dramatic poetry.

About this time began a long and bitter controverſy between Jeremy Collier and the poets. In the reign of Charles I., the puritans had raiſed a violent clamour againſt the drama, which they regarded as unfit for the encouragement of Chriſtians. This had in a great meaſure ſubſided, when, in 1698, Collier publiſhed "A Short View of the Immorality and Profaneneſs of the Engliſh Stage;" in which he attacked with great juſtice, though perhaps with ſome degree of aggravation, the licentiouſneſs of the dramatic writers, among whom Congreve was included. The poet replied, and endeavoured to palliate the alleged enormity of particular paſſages, though it was impoſſible to vindicate the general character and tendency of his pieces. Collier replied, and Congreve retired from the conteſt; and ſhortly after publiſhed his laſt comedy of "The Way of the World." This was reckoned the moſt perfect of his dramatic pieces; but it was received with ſo little favour on the ſtage, that, being in a high degree offended and diſguſted, he reſolved to commit his quiet and his fame no more to the caprices of an audience. From this time his life ceaſed to the public; he lived for himſelf and for his friends; and among his friends he was able to name every man of his time whom wit and elegance had raiſed to reputation.

Congreve continued to write copies of verſe upon particular occaſions, and in the year 1710, he publiſhed a collection of his plays and miſcellaneous poems, dedicated to his patron lord Halifax, to whoſe perſon and party he remained attached in all fortunes. Such was the reſpect which Congreve inſpired, as well by his private character as his genius, that in the great political change which brought the tories into power, his places were untouched, and he was allowed to maintain a dignified neutrality, praiſed and complimented on both ſides. On the return of his own friends to power, his emoluments were increaſed by the ſinecure place of ſecretary to the iſland of Jamaica, which raiſed his public income to full 1200*l.* a year: yet, ſays Dr. Johnſon, his honours were far greater than his profits. Every writer mentioned him with reſpect; and, among other teſtimonies to his merit, Steele made him the patron of his "Miſcellany," and Pope inſcribed to him his tranſlation of the Iliad.

Indolence was the reſult of Congreve's affluence. He not only ceaſed to make any literary exertions, but ſeems, with a conſiderable degree of affectation, to have declined the character of a man of letters; and when he received a viſit from Voltaire, the topic of his writings being introduced, Congreve ſpoke of them as trifles beneath him, and hinted that he expected to be viſited only as a gentleman. Voltaire replied, that had Mr. Congreve been ſo unfortunate as to be a mere gentleman, he ſhould never have been deſirous of ſeeing him.

The latter years of his life were clouded with a conſiderable portion of ſickneſs and infirmity. Cataracts in his eyes at length terminated in total blindneſs. The melancholy ſtate was aggravated by the gout, for which he ſought relief by a journey to Bath, but, being overturned in his chariot, he returned to his houſe in London, where he died, Jan. 29, 1728-9, in the ſixtieth year of his age. Having lain in ſtate in the Jeruſalem chamber, he was buried in Weſtminſter Abbey, where a monument is erected to his memory by the ducheſs of Marlborough; to whom, for reaſons either not known, or not mentioned, he bequeathed a legacy of ten thouſand pounds, in preference to the claims of kindred, at that time reduced to difficulties and diſtreſs.

It does not appear that any peculiar moral excellencies, or any remarkable talents for ſocial intercourſe, obtained for Congreve thoſe marks of attachment and regard which we have ſeen that he enjoyed. He lived in an eaſy independence, and, by the exerciſe of a poliſhed good nature, pleaſed and flattered thoſe who aſſociated with him, and never offended any one. He ſtands firſt among the Engliſh writers of comedy: a diſtinction for which he is indebted, not to ſuch a lively and humorous delineation of natural characters as delights and inſtructs in the ſcenes of Moliere, but to a continuation of wit and repartee in the dialogue, joined with originality of plot. His perſonages are always ſtrongly marked and well ſupported. One or two of his comedies are ſtill exhibited, and beheld with pleaſure, though ſo little reſembling the productions of the preſent age. His "Mourning Bride" is intereſting, and its principal characters well contraſted; it maintains its place in our theatres, and has, during the preſent ſeaſon, been repreſented with the higheſt applauſe. Biogr. Britan. Johnſon's Lives of the Engliſh Poets.

CONGRIER *en Pouance*, in *Geography*, a town of France, in the department of the Mayenne; 6½ leagues S.W. of Laval.

CONGRUITY, or CONGRUENCY, in the *Schools*, a ſuitableneſs or relation of agreement between things; whereby we come at the knowledge of what may be expected from them.

The ſyſtem of congruity in matters of grace conſiſts in this; that God, who knows perfectly the nature of grace, and the diſpoſitions of the will in all the circumſtances that ſhall befall a man, gives graces, wherewith, by virtue of their congruity with the will of a man, conſidered in thoſe circumſtances, man will always infallibly, but not neceſſarily, do what God would have him do; becauſe the will, in the language of the congruiſts, does always infallibly, though voluntarily, chooſe what appears beſt.

CONGRUITY, *merit of.* See MERIT.

CONGRUITY, in *Geometry*, is applied to figures, lines, &c. which exactly correſpond when laid over one another; as having the ſame terms, or bounds.

Thoſe things between which there is a congruity are equal and ſimilar.

Euclid, and by his example, moſt other geometricians, demonſtrate all their elements from the ſole principle of congruity: M. Leibnitz, and after him Wolfius, ſubſtitute the notion of ſimilitude in lieu of that of congruity.

CONGRUITY, in a lax ſenſe, is uſed to expreſs an aptitude, in ſome bodies, to unite, or incorporate; by reaſon of ſome ſimilitude or fitneſs of their figures: as incongruity denotes an unfitneſs of their ſurfaces for joining together. Thus, quickſilver will unite with gold, and many other metals, but will roll off from wood, ſtone, glaſs, &c.; and water, which will wet ſalt, and diſſolve it, will ſlip off from tallow without adhering to it; as alſo from a duſty ſurface, and from the feathers of water fowl.

Two drops of water or of mercury, will, on contact, immediately join and coaleſce; but oil of tartar, poured upon quickſilver, and ſpirit of wine and oil of turpentine on that, and air over all, will remain in the ſame veſſel without any manner of union, or mixture with each other. And the cauſe of this phenomenon is, that the figures of ſome bodies will not admit other bodies near enough to be within their ſpheres of attraction, whence they cannot join and cohere; but where their fitneſs of figure will let them approach near enough to feel each others' attractive power, then they cloſe and hold together. See COHESION.

CONG-TCHIN, in *Geography*, a town of China, of the third rank, in the province of Quang-ſi; 20 miles N.E. of Ping-lo.

CONGUSTUS, in *Ancient Geography*, a town of Aſia, in Galatia. Ptolemy.

CONHOCTON CREEK, in *Geography*, a creek of America, in the weſtern parts of the ſtate of New York, in the Geneſee country, which runs over a bed of gravel at the foot of the hills that ſurround the newly eſtabliſhed poſt-town, called Bath, and, about 20 miles below this town, falls into Tyoga river. In this creek there is a conſiderable fall, juſt above the town, which affords a very fine ſeat for mills. Extenſive ſaw and flour mills have already been erected upon it; the principal ſaw in the former of which, gave, when Mr. Weld viſited the mill, 120 ſtrokes in a minute, ſufficient to cut, in the ſame interval of time, 7 ſquare feet, ſuperficial meaſure, of oak timber; and yet capable, when the water is high, of producing effect much more expeditiouſly. During floods, light batteaux may paſs along the creek, Tyoga and Suſquehannah rivers, from Bath to Cheſapeak bay, without interruption.

CONI, a large fortified town of France, in the department of Stura, which was formerly a part of Piedmont in Italy, belonging to the king of Sardinia. It is ſituated on the confluence of the Geſſe and the Stura, 42 miles S. from Turin, 54 N.E. from Nice, and 615, or 820 kiliometres, from Paris. As chief place of the department, it has a prefect, a court of juſtice, and ſeveral tax offices, and is the reſidence of the brigade-general commanding the department. The fertility of the ſoil of its diſtrict, equally abundant in corn and paſtures, and the advantage of a canal which goes from the river Stura to the Po, and facilitates its communication with the interior parts of France, render Coni the centre of a conſiderable commerce. Its inhabitants amount to 16500. The population of the canton, including 16 communes, is 17,275. The whole diſtrict comprizes 85 communes with 121,433 inhabitants, upon a territorial extent of 2530 kiliometres.

Coni is ſaid to have been firſt founded in 1520, during the pontificate of Calixtus II.; and the following account is given of its origin. The inhabitants of ſome villages having been grievouſly oppreſſed by their lords, who, among other enormities, pretended a privilege granted by the emperor to deflower the brides before the huſbands touched them, the people, at length, attacked their lords, expelled them the country, and deſtroyed their caſtles, which had ſerved as their protection, and leſt their oppreſſors ſhould return with foreign aid, they left their home and founded Coni. Their number daily increaſing, they formed an alliance with the city of Aſti, and Luchin, duke of Milan, and became a flouriſhing republic, which form of government continued for ſome years. At length they ſubmitted to Charles of Anjou, comte of Provence. Some time after his death, they came under Jane, queen of Naples, who was incapable of ſupporting the weight of government; and therefore the town of Coni, in order to enſure protection, voluntarily ſubmitted to Amadeus VI., comte of Savoy, to whom it afterwards continued faithful. After valiantly defending itſelf againſt many ſucceſſive ſieges, for near three centuries, the rapid ſucceſſes of the French in Piedmont, during the months of April and May in 1796, obliged the king of Sardinia to make overtures for peace, and to ſurrender Coni, with Alexandria, Suſa, and Tortona, into the hands of the French, as hoſtages of his good faith; and it afterwards became the principal place of a diſtrict, as we have already ſtated, in one of the ſix Piedmonteſe departments, called Stura.

CONIA, in *Botany*, the name of a genus formed by Ventenat, for the powdery byſſi of Linnæus and other authors.

CONIACI, in *Ancient Geography*, a people of Spain, placed by Strabo near the ſources of the Ebrus, in the vicinity of the Cantabri.

CONIC SECTIONS, as the name imports, are ſuch curvelines as are produced by the mutual interſection of a plane and the ſurface of a ſolid cone. The nature and properties of theſe figures were the ſubject of an extenſive branch of the *Ancient Geometry*, and formed a ſpeculation well ſuited to the ſubtle genius of the Greeks. In modern times, the conic geometry is intimately connected with every part of the higher mathematics and natural philoſophy. A knowledge of thoſe diſcoveries, that do the greateſt honour to the laſt and the preſent centuries, cannot be attained without a familiar acquaintance with the figures that are now to engage our attention.

In this article we ſhall treat of the cone, and the more general properties of thoſe figures called the conic ſections; and we ſhall conclude with a ſhort hiſtorical account of this branch of mathematical learning. The more particular properties of each figure will be delivered under the proper heads in the progreſs of our work.

We begin with premiſing a few lemmas, on which the theory of conic ſections, we are to deliver, is founded.

LEMMAS.

Definition. If a right line, A B (*Plate* II. *Conics: fig.* 1.), be ſo divided in the points D and E, that A D is to D B as A E is to E B; then that right line is ſaid to be harmonically divided.

Cor. If a right line, A B, be divided in E, then it cannot be cut in D and *d*, ſo as to be harmonically divided both in E and D, and in E and *d*.

For, if it were poſſible, it is plain that A D would be to D B as A *d* to *d* B, 11. 5. E: which is abſurd, 14. 5. E.

LEMMA I. *Fig.* 1.

If a right line, A B, be biſected in C, and cut in E and D, ſo that C A or C B is a mean proportional between C E and C D: then A B is harmonically divided in D and E.

For, becauſe $CD : CA :: CA : CE$
therefore, $CD + CA : CD - CA :: CA + CE : CA - CE$
that is, $AD : DB :: AE : EB$.

Cor. If A B be biſected in C, and harmonically divided in D and E, then A C or C B is a mean proportional between C D and C E. *Cor. Def.* 1.

LEMMA II. *Fig.* 2.

If two tangents of a circle be drawn from the ſame point, A, then any chord of the circle, as E D, which, being produced, paſſes through A, and cuts the line, B C, that joins the two points of contact, in F, is harmonically divided in the points F and A.

Let O be the centre of the circle, and draw O H perpendicular to E D, and draw O B and O C to the points of contact. Becauſe the angles at B, H, and C, are all right angles, 18. 3. E, the circle deſcribed on the diameter A O will paſs through A, B, H, O, and C, 31. 3. E: therefore $AF \times FH = BF \times FC = EF \times FD$, 35. 3. E: therefore $AF \times FH + FH^2$, or $AH \times FH = EF \times FD + FH^2 =$ (becauſe E D is biſected in H) HD^2, 5. 2. E. Therefore E D is harmonically divided in F and A, *Lem.* 1.

Cor. And if a chord, as E D, which, when produced, paſſes through A, be harmonically divided in A and F, then F is a point in the chord B C.

For, if not, then the chord, D E, could be harmonically divided at A and F, and alſo at A, and another point, different from F, which is abſurd. *Cor. Def.*

LEMMA III. *Fig.* 3 and 4.

Let C be the centre of a circle, and let D and E be two points in a diameter, A B, and both on the ſame ſide of the centre; and let the radius of the circle be a mean proportional between C D and C E: draw M N perpendicular to A B through E; then any chord, as H K, which, being produced if neceſſary, paſſes through D, and cuts M N in F, is harmonically divided in D and F.

Draw C L perpendicular to H K from the centre C. Becauſe $CA^2 = CD \times DE$, therefore $CA^2 - CD^2$ (or $CD^2 - CA^2$), or $AD \times DB = EC \times CD - CD^2$ (or $CD^2 - EC \times CD$), or $CD \times DE$. And becauſe the angles at E and L are right angles, therefore $LD \times DF = CD \times DE = AD \times DB = HD \times DK$, 35. 3. E. $=$ (becauſe H K is biſected in L), $LK^2 - DL^2$ (or $DL^2 - LK^2$). Therefore, $LK^2 = DL^2 + LD \times DF$ (or $DL^2 - LD \times DF$) $= DL \times LF$: therefore H K is harmonically divided in D and F. *Lem.* 1.

LEMMA IV. *Fig.* 5 and 6.

The ſame conſtruction being made as in the laſt lemma; if H K be a chord, which, when produced if neceſſary, paſſes through D; then tangents of the circle drawn from the extremities of H K will meet one another in the line M N. And if tangents of the circle be drawn from a point aſſumed in M N, the chord drawn through the two points of contact, being produced if neceſſary, will paſs through the point D.

Let H K be a chord paſſing through D, and let tangents drawn from H and K meet in F: draw C F (cutting H K in L) to the centre of the circle, and join C K and F E. It is manifeſt that $FC \times CL = CK^2$, 8. 6. E. $= CD \times CE$, hyp. Therefore a circle deſcribed through D, F, and L, will paſs through E, 36. 3. E; therefore the angle $FED =$ the angle FLD, 21. 1. E. Therefore F E is perpendicular to A B, and F is a point in M N drawn from E perpendicular to A B.

Next, let F be in M N, and let H K and A B, both produced if neceſſary, interſect in *d*. Becauſe the angles F L *d* and F E *d* are right angles; therefore $FC \times CL = dC \times CE$, 36. 3. E. But $FC \times CL = CK^2 = CD \times DE$; therefore $dC \times CE = DC \times CE$; therefore the point *d*, in which H K and A B interſect, is the ſame as the point D.

LEMMA V. *Fig.* 7.

If the baſe of a triangle, A B, be biſected in D, and C G be drawn parallel to A B through the vertex; then any line, as E F, parallel to C D, and terminated by C B and C A, produced if neceſſary, is biſected by C G.

Draw B H K parallel to C D. Becauſe $AD = DB$; therefore $AC = CK$, 2. 6. E. Therefore $BH = HK$. And, it is plain that E F, parallel to B K, is likewiſe biſected.

LEMMA VI. *Fig.* 8 and 9.

If A B, the baſe of a triangle, be harmonically divided in D and E, and the lines C D and C E be drawn; then any line, as H F, parallel to C E, and terminated by B C and C A, produced if neceſſary, is biſected by C D.

Draw L K parallel to C E through D.
Becauſe $AD : DB :: AE : EB$.
Alternando, $AD : AE :: DB : EB$.
But, on account of equiangular triangles,
$AD : AE :: DL : CE$, 4. 6. E.
and $DB : BE :: DK : CE$;
therefore $DL : CE :: DK : CE$.

Therefore D L = D K, 9. 5. E. Therefore any line parallel to L K, as F H, is biſected by C D.

Cor. If H F be biſected by C D, and C E be parallel to H F, then A B is harmonically divided in D and E.

For, if not, then H F could be biſected by two lines drawn through C; which is abſurd.

Of the Cone and its Sections.

Definitions.

Fig. 10. I. Let A D B be a circle, and V a fixed point without the plane of the circle; then, if a right line, paſſing continually through the point V, be carried round the whole periphery of the circle A D B, that right line, being extended indefinitely on the ſame ſide of V as the circle, will deſcribe a conic ſurface; and, if it be likewiſe extended indefinitely on the other ſide of V, it will deſcribe two oppoſite conic ſurfaces.

Cor. A ſtraight line drawn from the vertex to any point in a conic ſurface, being produced indefinitely, is wholly in the oppoſite ſurfaces.

For a line, ſo drawn, will coincide with the line that generates the conic ſurfaces, when this line, by being carried round the circumference of the baſe, comes to the propoſed point.

II. The ſolid figure, contained by the conic ſurface and the circle A D B, is called a cone. The point V is named the vertex of the cone; the line V C, drawn to the centre of the circle, the axis of the cone; and the circle A D B, the baſe of the cone.

III. A right cone is when the axis is perpendicular to the plane of the baſe; otherwiſe, it is a ſcalene, or oblique cone.

IV. A right line that meets a conic ſurface in one point only, and is every where elſe without that ſurface, is called a tangent.

Prop. I. *Fig.* 10.

The common interſection of a conic ſurface and a plane V D E, that paſſes through the vertex, and cuts the baſe of the cone, is a rectilineal triangle.

For the common ſection of the plane of the baſe, and the plane drawn through the vertex, (which is a right line, 3. 11. E.), will cut the periphery of the baſe in two points, D and E, and in theſe two points only: then, having drawn D V and E V to the vertex of the cone, theſe lines will be both in the conic ſurface (*Cor. Def.* 1.), and alſo in the plane ſurface; and there are no points, excepting in theſe lines indefinitely produced, which are common to both the ſurfaces. Therefore the figure D V E, which is the common interſection of the cone and a plane through the vertex, is a rectilineal triangle.

Prop. II. *Fig.* 11 and 12.

If two points, D and E, (not in the ſame right line with the vertex) be aſſumed in a conic ſurface, the right line that joins them falls wholly within the conic ſurface, and when produced both ways it falls wholly without the ſurface; but if the aſſumed points be in oppoſite ſurfaces, the right line that joins them falls without the conic ſurfaces, and, when produced, it falls within one conic ſurface on one ſide, and within the other conic ſurface on the other ſide.

From V, the vertex of the cone, draw the lines V D and V E, cutting the periphery of the baſe in the points B and C; then, a plane being drawn through the vertex and the points D and E, that plane will cut the baſe in the chord B C, and the common ſections of the plane and the conic ſurfaces are the two right lines V B and V C indefinitely produced, *Pr.* 1. Now the right line D E, which is wholly contained in this plane, can meet the lines V B and V C only in the points D and E. When the points D and E are in the ſame conic ſurface, then the line D E is contained in the angle B V C within the conic ſurface, and, produced both ways, it is contained in the adjacent angles B V M and C V N without the conic ſurface. On the other hand, when D and E are in oppoſite ſurfaces, D E is contained in the angle B V M, or C V N, without the conic ſurfaces, and, being produced both ways, it is contained either in the angle B V C, or in the angle M V N, within the conic ſurfaces.

Cor. A right line cannot meet a conic ſurface in more than two points.

Prop. III. *Fig.* 11.

If a point, E, be aſſumed in a conic ſurface, and a line, P Q, be drawn through it, ſo as to be parallel to a right line, V B, paſſing through the vertex, and contained in the conic ſurfaces; then the right line, P Q, will not meet either of the oppoſite ſurfaces in another point, but it will fall within the ſurface, in which the aſſumed point E is, on the one ſide, and it will be wholly without both ſurfaces on the other ſide.

For if a plane be conceived to be drawn through the line V B and the point E, the line P Q, parallel to V B, will be wholly in that plane, 7. 11. E; and the common ſections of the plane and the conic ſurfaces will be the line V B and the line V E C drawn through the vertex and the point E, *Pr.* 1. Now the line, Q P, does not meet either of the lines V B or V C in another point different from E. Alſo Q E, the part of the line that is contained in the angle B V C, is within the cone; and P E, the part of it that is contained in the angle C V N, is without both the oppoſite ſurfaces.

Prop. IV. *Fig.* 12.

If a plane be drawn through the vertex of a cone and a tangent of the conic ſurface G H, it will meet the conic ſurface only in the line, V D, drawn through the vertex of the cone and the point of contact of the tangent.

For, becauſe the point D and the vertex V are common both to the plane ſurface and to the conic ſurface, therefore the line V D, indefinitely produced, is likewiſe common to both ſurfaces. And becauſe G H meets the conic ſurface only in the point D, and is every where elſe without the ſurface, therefore any line (different from V D), as V F, drawn in one of the conic ſurfaces, is contained on one ſide of the plane; and the ſame line continued in the oppoſite conic ſurface, as V K, is contained on the other ſide of the plane.

Cor. 1. Any ſtraight line, drawn in the plane, V G H, ſo as to meet the line V D, is a tangent of the conic ſurfaces.

Cor. 2. No other plane, beſides the plane V G H, can be drawn ſo as to touch the conic ſurfaces in the line V D without cutting them.

For, R S the common ſection of the plane V G H, and the plane of the baſe, is a tangent to the periphery of the baſe, *Cor.* 1. And, if there were two ſuch planes, there would likewiſe be two tangents of a circle drawn through the ſame point of the periphery, which is abſurd.

Prop. V. *Fig.* 13.

If either of two oppoſite conic ſurfaces be cut by a plane parallel to the baſe of the cone, the ſection is a circle, having its centre in the axis of the cone.

Through V C, the axis of the cone, let two planes be drawn cutting the baſe in the lines C D and C E, and the plane parallel to the baſe, in the lines G H and G L, and the conic ſurfaces in the lines V H D and V L E: then, becauſe the baſe is parallel to the cutting plane, therefore C D is parallel to G H and C E to G L, 16. 11. E. Therefore, on account of equiangular triangles, 4. 6. E.

DC : CV :: HG : GV
CV : CE :: GV : GL
Ex æquo DC : CE :: HG : GL

But $DC = CE$, therefore $HG = GL$. And in like manner it may be ſhewn that any right line, drawn from G to a point in the interſection of the plane, and the conic ſurface, is equal to G H; therefore the ſection is a circle.

Cor. If, through a point ſituated within or without a conic ſurface, two ſtraight lines, both parallel to the plane of the baſe of the cone (that is, parallel to ſtraight lines in that plane), be drawn to cut, or touch the conic ſurface: then the rectangle contained by the two ſegments (between the point and the conic ſurface), of one of the lines when it cuts, or the ſquare of its ſegment when it touches the conic ſurface, is equal to the rectangle contained by the two ſegments of the other line when it cuts, or to the ſquare of its ſegment when it touches the conic ſurface.

For a plane drawn through the two lines will be parallel to the plane of the baſe, 15. 16. E; and it will interſect the conic ſurface in the periphery of a circle: whence the corollary is manifeſt, 35 and 36. 3. E.

Prop. VI. *Fig.* 14.

If two diameters of the baſe of a cone, as A B and C D, interſect one another at right angles, a plane drawn through the vertex of the cone, and one of the diameters, C D, will biſect any ſtraight line, as E F, terminated both ways by one of the conic ſurfaces, and parallel to the other diameter A B.

Through V and E F draw a plane cutting the conic ſurface in the lines V G and V K, and the plane of the baſe in the line G H K; becauſe E F is parallel to A B; therefore G K is parallel both to A B and E F, 16. 11. E; and it is perpendicular to C D; therefore G K is biſected by the diameter C D, 3. 3. E. And, becauſe G K is biſected in H, therefore E F, parallel to G K, is biſected by V H, that is, by the plane drawn through V and C D.

Prop. VII. *Fig.* 15. *Plate* III.

If a point, as B, be aſſumed in the plane of the baſe of a cone, but without the periphery of the baſe, and, from that point, two tangents, B P and B Q, be drawn to the baſe, and likewiſe a ſtraight line, B V, to the vertex of the cone: then any ſtraight line, as E F, parallel to B V, and terminated both ways by one of the conic ſurfaces, is biſected by a plane drawn through V, the vertex of the cone, and cutting the plane of the baſe in the chord P Q.

Becauſe B V and E F are parallel to one another, therefore they are in one plane, 7. 11. E: let the plane, drawn through B V and E F, cut the conic ſurface in the lines V E G, and V F K; and let the ſame plane cut the plane of the baſe in the line B G K, and the plane paſſing through V, and the chord P Q in the line V D H. Becauſe G K is harmonically divided in H and B, *Lem.* 2. therefore E F, parallel to V B, is biſected by the line V H, *Lem.* 6. But D, the point where V H cuts E F, is the point where the plane drawn through V and the chord P Q cuts E F: therefore E F, parallel to B V, is biſected by that plane.

Prop. VIII. *Fig.* 16.

Let a plane, paſſing through the vertex of a cone, cut the plane of the baſe in a diameter of the baſe C D: and let A B, a diameter of the baſe, be perpendicular to C D; and let M N be drawn through the vertex of the cone parallel to A B; then if a right line G K, in the plane C V D, and terminated by one of the conic ſurfaces, be biſected by a plane paſſing through M N, this plane will biſect all right lines terminated by one of the conic ſurfaces and parallel to G K.

Let the plane which biſects G K cut the plane of the baſe in the line P Q, and the plane C V D in the line V H O: through V draw V L parallel to G K, and let it meet C D produced in L. Becauſe M N is parallel to A B; therefore P Q (the common ſection of two planes drawn through M N and A B) is parallel to M N and to A B, 16. 11. E: therefore P Q is perpendicular to C D. Becauſe G K is biſected by V O, and is parallel to V L; therefore C D, the baſe of the triangle C V D, is harmonically divided in L and O, *Cor. Lem.* 6. conſequently, if two tangents of the baſe be drawn from L, the chord that joins the points of contact of theſe tangents will paſs through O, *Cor. Lem.* 2; and it will be perpendicular to the diameter C D: therefore that chord will coincide with the line P Q, which is the only line that can be drawn through O perpendicular to C D. Therefore all right lines, terminated by one of the conic ſurfaces, and parallel to V L or G K, are biſected by the plane V P Q drawn through M N to biſect G K, *Pr.* 7.

If G K be parallel to C D, then C D will be biſected in O, and P Q will coincide with A B; ſo that this propoſition, in this caſe of it, is the ſame as *Prop.* 6.

Cor. If a plane be drawn through M N to biſect any one right line terminated by one of the conic ſurfaces, and parallel to a line G K in the plane V C D, the ſame plane will biſect all right lines terminated by one of the conic ſurfaces and parallel to G K.

For, if not, then the ſame ſtraight line could be biſected by two planes both paſſing through M N, which is abſurd.

Prop. IX. *Fig.* 17.

Let a plane, paſſing through the vertex of a cone, cut the plane of the baſe in a line C D, not paſſing through E the centre of the baſe: draw the diameter, A F B, perpendicular to C D, and produce it to M; ſo that E M may be a third proportional to E F and E B the radius of the baſe of the cone, and draw M V N through the vertex: then if a right line G K, in the plane C V D, and terminated by one of the conic ſurfaces, be biſected by a plane paſſing through M N, this plane will biſect all right lines terminated by one of the conic ſurfaces and parallel to G K.

Let the plane which biſects G K cut the plane of the baſe in the line P Q M, and the plane C V D in the line V H O: through V draw V L parallel to G K, and let it cut C D produced in L. Becauſe V O biſects G K, and V L is parallel to G K, therefore C D, the baſe of the triangle C V D, is harmonically divided in O and L, *Cor. Lem.* 6; therefore if two tangents of the baſe be drawn from L, the chord that joins the points of contact of theſe tangents will paſs through the point O, *Cor. Lem.* 2; but the ſame chord, being produced, likewiſe paſſes through the point M, *Lem.* 4: therefore that chord will coincide with P Q, which is the only right line that can paſs through both the points O and M, therefore all right lines terminated by one of the conic ſurfaces and parallel to L V, or G K, are biſected by the plane V P Q drawn through M N to biſect G K, *Pr.* 7.

Cor. If a plane be drawn through M N to biſect any one right line, terminated by a conic ſurface, and parallel to a line G K, in the plane V C D, or parallel to the plane V C D, that plane will biſect all right lines terminated by a conic ſurface, and parallel to G K.

For, if not, then the ſame right line could be biſected by two planes, both paſſing through M N; which is abſurd.

Prop. X. *Fig.* 18.

Let a plane, paſſing through the vertex of a cone, cut the plane of the baſe in a line C D, which neither cuts nor touches the periphery of the baſe: draw A B F, through E, the centre of the baſe, perpendicular to C D, and take E M, a third proportional to E F, and the radius of the baſe of the cone; and draw M V through the vertex: then if a right line G K, parallel to the plane C V D, and terminated by one of the conic ſurfaces, be biſected by a plane paſſing through M V, this plane will biſect all right lines terminated by one of the conic ſurfaces, and parallel to G K. But the point H, in which the plane, that biſects G K, cuts G K, muſt not be in the ſame right line with the point M, and the vertex of the cone.

Let the plane which biſects G K, cut the plane of the baſe in the line P Q, draw V L parallel to G K; and becauſe G K is parallel to the plane C V D, therefore V L parallel to G K, is in the plane C V D, and it will cut the plane of the baſe in L, a point of the line C D. And, becauſe G K is parallel to V L, therefore they are contained in one plane, 7. 11. E. Let this plane be drawn, and let it cut the conic ſurface in V R and V S, the plane of the baſe in L R S, and the plane V P Q, in V O. Becauſe G K is parallel to V L, and it is biſected by V O, therefore S R, the baſe of the triangle S V R, is harmonically divided in O and L, *Cor. Lem.* 6.; therefore, if two tangents of the baſe be drawn from L, the chord that joins the points of theſe tangents will paſs through the point O, *Cor. Lem.* 2.; but, becauſe L is a point in C D, the ſame chord will paſs through M, *Lem.* 4.; and, becauſe the point O does not fall upon M, therefore the chord will coincide with P Q, which is the only line that can paſs both through O and M. Therefore, all right lines, terminated both ways by one of the conic ſurfaces, and parallel to V L, or G K, are biſected by the plane, V P Q, *Pr.* 7.

Prop. XI. *Fig.* 19.

Let a plane touching a conic ſurface cut the plane of the baſe in a line, C D, which touches the periphery of the baſe in P; then, if a right line, G K, terminated by one of the conic ſurfaces, and parallel to the touching plane, V C D, be biſected by a plane drawn through V P; this plane will biſect all right lines parallel to G K, and terminated by one of the conic ſurfaces.

Through V draw V L parallel to G K: becauſe G K is parallel to the plane V C D, therefore, V L, parallel to G K, is in the plane V C D, and it will cut the plane of the baſe in L, a point in C D. And, becauſe V L is parallel to G K, therefore they are contained in one plane, 7. 11. E.; let this plane be drawn, and let it cut the conic ſurface in the lines V M and V N, the plane of the baſe in the line L M N, and the plane V Q P, in the line V O. Becauſe G K is parallel to V L, and it is biſected by V O, therefore, M N, the baſe of the triangle V M N, is harmonically divided in O and L, *Cor. Lem.* 6. Therefore, if two tangents of the baſe be drawn from L, the chord that joins the two points of contact of theſe tangents will paſs through the point O, *Cor. Lem.* 2.; but the ſame chord likewiſe paſſes through Q, which is one of the points of contact of tangents drawn from L; therefore, the chord coincides with the line Q P. Therefore the plane V Q P, biſects all right lines terminated by one of the conic ſurfaces, and parallel to V L, or G K, *Pr.* 7.

Fig. 20, 21, 22, 23. If a cone be cut by a plane P Q, which neither paſſes through the vertex, nor is parallel to the baſe, then, a plane, as V M N, being drawn through the vertex parallel to the cutting plane, it will neceſſarily meet the plane of the baſe of the cone. The line of common ſection of the parallel plane, and the baſe of the cone M N, may have one or other of three different poſitions; *viz.*

Fig. 20. 1ſt. It may be without the baſe of the cone.

Fig. 21. 2dly. It may touch the periphery of the baſe of the cone.

Fig. 22. and 23. 3dly. It may cut the periphery of the baſe of the cone.

Theſe three different caſes offer three ſections for our conſideration that are very different from one another, and poſſeſs many properties that are peculiar to each, while they have many that are common to all the three.

Def. V. If the line of common ſection, M N, (*fig.* 20.), be without the baſe of the cone, then the plane V M N, drawn through the vertex, will be entirely between the two conic ſurfaces, not meeting either of them. In this caſe, the cutting plane P Q, will meet every line drawn from the vertex in one of the conic ſurfaces, and the curve line of common ſection will ſurround that conic ſurface, and will completely encloſe a ſpace. In this poſition of the cutting plane, the conic ſection is called an ellipſe.

Def. VI. If the line of common ſection M N, (*fig.* 21.) touch the periphery of the baſe, then the plane drawn through the vertex will touch the conic ſurfaces, *Pr.* 4. And the oppoſite ſurfaces will be on different ſides of it. In this caſe alſo the cutting plane will meet every line drawn from the vertex in one of the conic ſurfaces, excepting only the line of contact, V B, in which the touching plane meets that conic ſurface: and as the cutting plane is indefinitely extended along the touching plane without meeting it, it is obvious that the curve line formed by the common ſection of the cutting plane and the conic ſurface does not return into itſelf ſo as to encloſe a ſpace, but it is open on the ſide oppoſite to the vertex of the cone. In this poſition of the cutting plane, the conic ſection is called a parabola.

Def. VII. If the line of common ſection M N (*fig.* 22 & 23.) cut the periphery of the baſe, then the plane drawn through the vertex will divide each of the oppoſite conic ſurfaces into two parts lying on oppoſite ſides of it. In this caſe the cutting plane being indefinitely extended will meet every line drawn from the vertex in thoſe parts of the two conic ſurfaces that lie on the ſame ſide of the plane, through the vertex, as the cutting plane itſelf; and thus two curve lines will be formed by the common interſection, of the cutting plane, and the two oppoſite conic ſurfaces. It is obvious that theſe curve lines may be indefinitely extended, and that they do not return into themſelves ſo as to encloſe a ſpace. In this poſition of the cutting plane the conic ſection, formed by its interſection with one of the conic ſurfaces is called a hyperbola; and the two conic ſections formed by its interſections with the two oppoſite conic ſurfaces, are called oppoſite hyperbolas, or oppoſite ſections.

Def. VIII. The nature of the ſeveral conic ſections defined in the three laſt definitions depends entirely, as we have ſeen, on the relative poſition that the line of common ſection of the plane of the baſe and the plane drawn through the vertex parallel to the cutting plane, has in reſpect to the circle that forms the baſe of the cone. As there will be frequent occaſion to refer to this line, in the following theory of the conic ſections, it will be requiſite, for the ſake of abridging language, to diſtinguiſh it by a peculiar name. For this purpoſe we ſhall call it the *determining line.*

Def. IX. Let a plane, as P Q, (*fig.* 20 and 22.) cut a conic ſurface, or oppoſite ſurfaces, and let M N be the *determining line*, or the common ſection, of the plane of the baſe and the plane drawn through the vertex parallel to the plane P Q: from C, the centre of the baſe of the cone, draw C D perpendicular to M N, and take C E a third proportional to C D and C A or C B, the radius of the baſe: then, a line being drawn from the vertex V to the point E, it will meet the plane P Q in a point G, which is called the centre of the conic ſection, or oppoſite ſections, formed by the common interſection of the plane P Q, and the conic ſurface, or oppoſite ſurfaces.

But, if the *determining line* M N (*fig.* 23.) cut the baſe of the cone, and paſs through its centre, then, the diameter A B being perpendicular to M N, and V G being drawn through the vertex parallel to A B; V G will meet the plane P Q in a point G, which, in this caſe, is the centre of the oppoſite ſections.

Fig. 20, 22, 23. *Cor.* 1. The centre of an ellipſe is a point within the figure; but the centre of two oppoſite hyperbolas is a point without both hyperbolas, and ſituated between them.

For, when the line M N is without the baſe of the cone, the point E and the line V E are within the conic ſurface; but, when M N cuts the baſe, then E and V E are without both of the two conic ſurfaces and between them.

Cor. 2. A parabola has no centre.

Fig. 21. For, in this caſe, the points E and D coincide with the point B, where M N touches the periphery of the baſe; and the line V E coincides with the line V B which does not meet the cutting plane P Q.

Cor. 3. The centre of a conic ſection is never in the axis of the cone, unleſs when the cutting plane is parallel to the baſe of the cone.

Def. X. A right line drawn in the plane of a conic ſection ſo as to meet the curve of the ſection in one point only, and which, being produced both ways, is contained on one and the ſame ſide of the ſection, is called a tangent of the ſection.

Cor. 1. A tangent of a conic ſection is a tangent of the conic ſurface.

For it can meet the conic ſurface only in the point in which it meets the ſection.

Cor. 2. There cannot be more than one tangent of a conic ſection at the ſame point of the curve.

For if there were two tangents, then two planes drawn through them and the vertex of the cone would meet the conic ſurface in the ſame right line without cutting the conic ſurface, which is abſurd. *Cor.* 2. *Pr.* 4

Prop. XII.

A right line, drawn in the plane of a conic ſection, cannot meet the curve in more than two points.

For ſuch a line does not meet the conic ſurface in more than two points. *Cor.* 2.

Prop. XIII.

A right line drawn through a point in a conic ſection, in the ſame plane with it, and parallel to a line drawn from the vertex in the conic ſurface, does not meet the curve of the conic ſection again in another point.

For it does not meet the conic ſurface in another point, *Pr.* 3. Thus, in the parabola, if P Q be drawn parallel to V B, (*fig.* 21.), then P Q meets the curve only in the point P.

Prop. XIV. *Fig.* 24, 25, and 26. *Plate* IV.

Every ſtraight line, as F H, drawn through G, the centre of an ellipſe, or oppoſite hyperbolas, and terminated both ways by the curve, or oppoſite curves, is biſected in the centre.

I. When the *determining line* M N, (*fig.* 24 and 25), does not paſs through the centre of the baſe. Through V, the vertex of the cone, and the line F H, draw a plane cutting the conic ſurface in the lines V H L and V F K, and the plane of the baſe in the line L K M, and the plane V M N in the line V M. Becauſe the point G is in the line V G E; therefore, the line L K M will paſs through the point E. And becauſe F H and V M are the common ſections of the plane V K L, and two parallel planes (*viz.* the plane of the ſection and the plane V M N), therefore F H is parallel to V M, 16. 11. E. And, becauſe C B or C A, the radius of the baſe of the cone, is a mean proportional between C D and C E, and M N is perpendicular to A B; therefore, the chord K L is harmonically divided in E and M, *Lem.* 3. And becauſe L K is the baſe of the triangle K V L, and F H is parallel to V M, therefore, F H is biſected by V E, *Lem.* 6.: that is, F G = G H.

In the ellipſe, when F H (*fig.* 20.) is parallel to M N, it will be perpendicular to a diameter of the baſe drawn perpendicular to the diameter A B; therefore, it is biſected by the plane V A B, which cuts it in G, *Pr.* 6.

II. When the *determining line*, (*fig.* 26.) paſſes through the centre of the baſe. In this caſe, V G is parallel to the diameter A B *Def.* IX. And L K, the common ſection of the plane of the baſe, and the plane V Q K (drawn through V, and the line F G H), is parallel both to A B and to V G, 7. 11. E. But the diameter M N is perpendicular to the diameter A B; therefore, it is alſo perpendicular to K L, and it biſects K L, 3. 3. E. And becauſe F H and V M are the common ſections of two parallel planes (*viz.* the plane of the conic ſection, and the plane V M N), therefore F H is parallel to V M. And becauſe V M biſects the baſe of the triangle K V L, and V G is parallel to that baſe, therefore V G biſects F H parallel to V M. *Lem.* 5.

Definitions.

XI. A ſtraight line drawn through the centre of an ellipſe, or oppoſite hyperbolas, and terminated both ways by the curve or oppoſite curves, is called a diameter of the ellipſe, and a tranſverſe diameter of the oppoſite hyperbolas.

XII. A ſtraight line in the plane of a parabola, as P Q, (*fig.* 21.) drawn parallel to the right line V B, in the conic ſurface (which paſſes through the vertex of the cone, and the point in which the *determining line* touches the periphery of the baſe), is called a diameter of the parabola.

Cor. All the diameters of a parabola are parallel to one another.

XIII. A vertex of a diameter is a point where the diameter meets the curve of the conic ſection.

Cor. A diameter of a parabola has only one vertex, *Pr.* 13.

XIV. A ſtraight line (which is not a diameter of an ellipſe), terminated both ways by the curve of a conic ſection, and biſected by a diameter of the ſection, is ſaid to be ordinately applied to that diameter; or it is called a double ordinate; and the half of it, an ordinate of the diameter.

Prop. XV. *Fig.* 24, 25, and 26.

If a ſtraight line be ordinately applied to a diameter of an ellipſe, or a parabola, or to a tranſverſe diameter of a hyperbola, then all right lines parallel to it and terminated both ways by the ſame curve, or by the oppoſite curve, are ordinately applied to the ſame diameter.

Let R S T (*fig.* 24 and 25.) be ordinately applied to F H, a diameter of an ellipſe or a parabola, or a tranſverſe diameter of a hyperbola or oppoſite hyperbolas; then all other right lines, as P Q, parallel to R T, and terminated by the ſame curve, or the oppoſite curve, are ordinately applied to the ſame diameter F H. Draw a plane through V, the vertex of the cone, and the diameter F H. Then, in the caſe of the ellipſe and hyperbola, when the *determining line* does not paſs through the centre of the baſe, this plane will neceſſarily paſs through the line V E. And, becauſe the plane of the conic ſection is parallel to the plane V M N, therefore R T, in the former plane, is parallel to the latter plane. And becauſe the plane drawn through V, and the diameter F H, paſſes through V E, and biſects R T, which it cuts in S, a point not in the ſame right line with V and E; therefore, the ſame plane will biſect all right lines in either of the oppoſite cones that are parallel to R T. *Pr.* 10. and *Cor.* 9. Therefore, the diameter F H in that plane will biſect all the right lines which it meets, that are parallel to R T, and terminated by the ſection, or either of the oppoſite ſections.

And, when the *determining line* paſſes through the centre of the baſe (*fig.* 26), even, as before, R T is parallel to the plane V M N. And the diameter A B is perpendicular to the diameter M N, and G V is parallel to A B, *Def.* IX; therefore, the plane drawn through V G and F H, which biſects R T, will biſect all right lines in either of the oppoſite cones that are parallel to R T, *Pr.* 8. Therefore, F H in that plane will biſect all the right lines which it meets that are parallel to R T, and terminated by either of the oppoſite hyperbolas.

In the parabola, becauſe the plane of the ſection is parallel to the plane V M N; therefore, R T, (*fig.* 27.) in the former plane, is parallel to the latter plane. And becauſe V B is parallel to F H, therefore a plane may be drawn through them both; let this plane be drawn, and it will biſect all right lines in either of the oppoſite cones that are parallel to R T, *Pr.* 11. Therefore, F H, in that plane, will biſect all the right lines which it meets, that are parallel to R T, and terminated by the curve of the parabola.

Prop. XVI. *Fig.* 28.

A right line, drawn from a vertex of a diameter of an ellipſe, or a parabola, or from the vertex of a tranſverſe diameter of a hyperbola, ſo as to be parallel to a line ordinately applied to that diameter, is a tangent of the curve.

Fig. 28. Let F H be a diameter of an ellipſe or a parabola, or a tranſverſe diameter of a hyperbola, and R S T, a line ordinately applied to that diameter; then F M, drawn from a vertex of the diameter, ſo as to be parallel to R T, is a tangent of the curve. For, if F M be not a tangent, it will cut the ſection again in another point (*Cor.* 2. *Def.* X), let it cut the ſection again in K, and biſect F K in I. Then, if a diameter of the ſection be drawn through I, F K will be ordinately applied to that diameter, *Def.* XIV; therefore that diameter would biſect R T parallel to F K, *Pr.* 15. Therefore R T would be biſected by two different diameters; *viz.* by the diameter F H, and by that drawn through I. But, in the ellipſe and hyperbola, all the diameters paſs through the centre; and, in the parabola, they are all parallel to one another; therefore two diameters of a conic ſection will cut every ſtraight line (which does not paſs through the centre of the ellipſe and hyperbola) in two different points. Therefore R T cannot be biſected by two different diameters. Therefore F M, parallel to R T, does not cut the curve again; that is, F M is a tangent of the conic ſection.

Cor. 1. If R T be ordinately applied to the diameter F H, it is parallel to a tangent, F M, at a vertex of that diameter.

For there cannot be two tangents of a conic ſection at the ſame point of the curve.

Cor. 2. All right lines ordinately applied to the ſame diameter of a conic ſection are parallel to one another.

For they are all parallel to a tangent at a vertex of that diameter.

Prop. XVII. *Fig.* 24 and 27.

A diameter of a conic ſection being given, to draw a right line that ſhall be ordinately applied to that diameter.

Fig. 24. Let F H be a diameter of an ellipſe; draw a plane through the vertex V, and the diameter F H, cutting the plane of the baſe in the chord K L, which neceſſarily paſſes through the point E; draw tangents of the baſe from K and L, and let them interſect in O. Then O is a point in the *determining line* M N; *Lem.* 4; and V O being drawn to the vertex of the cone, it is in the plane V M N, and parallel to the plane of the ellipſe. Now, all ſtraight lines, as P Q and R T, in the plane of the ellipſe, drawn parallel to V O, are ordinately applied to the diameter F H; for theſe lines are all biſected by the plane V K L, that is, by F H in that plane, *Pr.* 7.

The conſtruction is exactly the ſame for the hyperbola.

Fig. 27. In the parabola the plane drawn through the diameter F H, paſſes through V B, parallel to F H, and it cuts the plane of the baſe in a chord B K, drawn from the point where the *determining line* M N, touches the periphery of the baſe; in this caſe draw K O, a tangent of the baſe, interſecting M N in O; then, as before, V O, drawn to the vertex, is parallel to the plane of the parabola; and all right lines, as R T, P Q, in that plane, parallel to V O, are ordinately applied to the diameter F H, *Pr.* 7.

Fig. 20, 21, 22, and 23. In all the conic ſections, when the plane drawn through the vertex of the cone, and a diameter P Q, cuts the plane of the baſe in a diameter of the baſe A B; then all right lines, as R T, in the plane of the ſection, drawn parallel to the *determining line* M N, are ordinately applied to the diameter P Q. For, if a diameter of the baſe be drawn parallel to M N, that diameter will be parallel to R T, and perpendicular to the diameter A B; therefore R T is biſected by the plane V A B, that is, by P Q, the diameter of the ſection in that plane, *Pr.* 6.

Prop. XVIII.

Tangents drawn from the vertices, of a diameter of an ellipſe, or of a tranſverſe diameter of a hyperbola, are parallel to one another; but tangents of a conic ſection, drawn from the vertices of two different diameters, are not parallel.

Let a right line be ordinately applied, to a diameter of an ellipſe, or to a tranſverſe diameter of a hyperbola, *Pr.* 17; then the tangent of the curve at either vertex of the diameter is parallel to that right line; conſequently, the two tangents at the extremities of the diameter are parallel to one another.

And becauſe a right line ordinately applied to one diameter of a conic ſection is not ordinately applied to another diameter; therefore a tangent at a vertex of one diameter is not parallel to a tangent at a vertex of another diameter.

Cor. If there be two parallel tangents of an ellipſe, or of oppoſite hyperbolas; theſe tangents are drawn from the extremities of a diameter of the ellipſe, or of a tranſverſe diameter of the hyperbolas.

PROP. XIX. *Fig.* 28.

A ſtraight line terminated both ways by the curve of a conic ſection, and parallel to a tangent, is ordinately applied to the diameter drawn through the point of contact.

Let R T, terminated by the curve of a conic ſection, be parallel to a tangent of the curve F M; then R T is ordinately applied to the diameter F H, drawn through the point of contact. Draw P Q ordinately applied to F H, *Pr.* 17. Then P Q is parallel to the tangent F M, *Cor.* 1. *Pr.* 16; therefore P Q is alſo parallel to R T. Conſequently, R T is ordinately applied to F H, *Pr.* 15.

PROP. XX. *Fig.* 29.

A ſtraight line G T, drawn from the centre of oppoſite hyperbolas ſo as to be parallel to F O and H I lines touching the curves at the vertices of a tranſverſe diameter F H, biſects all lines, as R S, terminated by the oppoſite hyperbolas and parallel to the tranſverſe diameter: and if a tranſverſe diameter, F H, be drawn parallel to a ſtraight line, as R S, terminated by oppoſite hyperbolas, and biſected by a line G T drawn through the centre, this line is parallel to F O and H I the tangents at the vertices of the tranſverſe diameter.

Draw the diameter R P, join S, P, and produce F H to cut S P in Q. Becauſe R S is parallel to F H, and R G = G P; therefore S Q = Q P: therefore S P is parallel to H I or F O, *Cor.* 1. *Pr.* 16. But G T is parallel to F O or H I: therefore G T is parallel to S P. Therefore it is manifeſt that G T biſects R S, 2. 6. E.

Again, if G T biſect R S, then is G T parallel to H I or F O; for, becauſe R T = T S, and R G = G P, therefore G T is parallel to S P, 2. 6. E. And becauſe F H is parallel to R S, therefore S Q = Q P, 2. 6. E.: therefore S P is parallel to H I, *Cor.* 1. *Pr.* 16. Therefore G T is parallel to H I or F O.

Def. XV. Let the *determining line* M N (*fig.* 30.) of two oppoſite hyperbolas cut the periphery of the baſe of the cone in M and N, and let tangents of the baſe be drawn from theſe points (which tangents will paſs through the point E when M N does not paſs through the centre of the baſe of the cone, *Lem.* 4; but they will both be parallel to the diameter A B and to the line V G, when M N does paſs through the centre): through the line V G, and the two tangents P M and Q N, let two planes be drawn cutting the plane of the hyperbolas in the lines G P and G Q, interſecting in the centre of the hyperbolas: then theſe lines are called aſymptotes of the hyperbolas.

Cor. 1. The aſymptotes do not meet the hyperbolas.

For the planes V P M and V Q N meet the conic ſurfaces only in the lines V M and V N produced, *Pr.* 4.: therefore the lines G P and G Q, in thoſe planes, are without the conic ſurfaces in which the hyperbolas are.

Cor. 2. The aſymptotes G P and G Q are parallel to V M and V N, the lines in which the planes V M P and V N Q touch the conic ſurfaces.

For the plane V M P cuts the plane of the hyperbolas and the plane V M N (which are parallel planes) in the lines G P and V M; and the plane V N Q cuts the ſame planes in the lines G Q and V N.

Cor. 3. If a line be drawn parallel to one of the aſymptotes through a point in one of the hyperbolas, that line does not meet the ſame hyperbola, nor the oppoſite one, again in another point.

For a line parallel to one of the aſymptotes is parallel to one of the lines V M and V N in the conic ſurface; therefore it does not meet either of the conic ſurfaces again in another point, *Pr.* 3.

Cor. 4. A ſtraight line in the plane of the hyperbolas, as F H, drawn through the centre of the hyperbolas within the angle contained by the aſymptotes, will meet both the hyperbolas.

Becauſe the aſymptotes are parallel to V M and V N, therefore, if V O be drawn parallel to F H, it will be within the angle M V N; and it is plain that F H, parallel to V O, meets both the conic ſurfaces.

LEMMA VII. *Fig.* 31.

Let A B and A C be two right lines that meet one another: then if B C, drawn through D, and terminated by A B and A C, be biſected in D, no other ſtraight line, terminated by A B and A C, and drawn through D, will be biſected in that point.

Draw G H through D, and D E parallel to A C; becauſe B D = D C, therefore A E = E B, 2. 6. E. Therefore A E and E G are not equal to one another: and, conſequently, G D and D H are not equal.

PROP. XXI. *Fig.* 30.

If a ſtraight line, terminated by the aſymptotes, as K L or S T, touch either of the hyperbolas, it is biſected in the point of contact: and if the middle point of a ſtraight line, as K L or S T, terminated by the aſymptotes be in either of the hyperbolas, that line is a tangent of the curve. Draw the diameter F H and let *a b* be ordinately applied to it, *Pr.* 17: alſo draw *d e*, between M V and V N, parallel to *a b*. Conceive a plane to be drawn through V G and F H, and let this plane cut the plane M V N in the line V O. It is manifeſt that V O is parallel to the diameter F H, 16. 11. E. And becauſe a plane drawn through V G biſects *a b*, the ſame plane will biſect all right lines in either of the oppoſite cones that are parallel to *a b*, *Cor.* 9; therefore it will biſect *d e*; that is, *d o* = *o e*. Becauſe K L is a tangent, it is parallel to *a b*, *Cor.* 1. *Pr.* 16, and, conſequently, to *d e*. And becauſe the aſymptotes are parallel to V M and V N, *Cor.* 2. *Def.* XV., and F H is parallel to V O, and *d e* to K L, it is plain that K L and *d e* are ſimilarly divided in H and O: therefore K H = H L.

Again, if K L meets the hyperbola in H, and is biſected there, it is a tangent. For, if not, then, a line being drawn between the aſymptotes to touch the hyperbola in H, it would likewiſe be biſected in H as has already been ſhewn: which is abſurd. *Lem.* 7. Therefore K L is a tangent.

PROP. XXII. *Fig.* 32. *Plate* V.

If a right line, that cuts an hyperbola or oppoſite hyperbolas, likewiſe cuts both the aſymptotes; the ſegments between the hyperbola, or hyperbolas, and the aſymptotes, will be equal.

Let the right line D E cut a hyperbola in S and P, and the aſymptotes in D and E: draw the tranſverſe diameter F H to biſect S P, and let K L be drawn to touch the hyperbola in H: becauſe F H biſects S P, therefore S P is parallel to the tangent K L, *Cor.* 1. *Pr.* 16, but K L is biſected in H, *Pr.*21.; therefore D E, parallel to K L, is biſected in Q: and becauſe D E and S P are both biſected in Q, therefore D S and S E are reſpectively equal to S P and P D.

Next let SR cut the two oppoſite hyperbolas in S and R; and the aſymptotes in N and I: draw G T through the centre to biſect S R; and draw the tranſverſe diameter F H parallel to S R; and let K L touch one of the hyperbolas at H, and draw K M parallel to S R: becauſe G T biſects S R parallel to F H, therefore G T is parallel to K L, *Pr.* 20: becauſe K M and F H are both parallel to S R, therefore they are parallel to one another: but K L is biſected at H, *Pr.* 21, therefore L M is biſected at G, and K M is biſected at O, 2. 6. E; therefore N I, parallel to K M, is biſected at T. And, becauſe S R and N I are both biſected at T, therefore the ſegments S N and N R are reſpectively equal to the ſegments R I and I S.

Prop. XXIII. *Fig.* 32.

The curve of an hyperbola approaches the nearer to the aſymptote the farther it is continued; and, if continued far enough, the diſtance of the curve from the aſymptote will become leſs than any aſſigned diſtance how ſmall ſoever.

Aſſume any point, as A in the hyperbola, and draw A X parallel to the aſymptote G C; then A X does not meet the hyperbola again, *Cor.* 3. *Def.* XV: through A draw any line B C to a point, as Z in the curve, and let B C meet the aſymptotes in B and C, and draw B X perpendicular to A X, and Z Y perpendicular to the aſymptote G C: becauſe A B = Z C, *Pr.* 21, it is plain that B X = Z Y: now the more diſtant the point Z is, the nearer is the line A B to the line A X, and the leſs is B X, or Z Y the diſtance of the curve from the aſymptote. And becauſe A B may be drawn ſo as to make B X leſs than any aſſigned line, therefore a point of the curve may be found that ſhall be nearer to the aſymptote than any aſſigned diſtance.

Definitions.

Fig. 30. *Plate* IV. XVI. If a ſtraight line be drawn through the centre of oppoſite hyperbolas parallel to the tangents S T and K L at the vertices of a tranſverſe diameter F H, and a part of that line biſected in the centre, as I R, be taken equal to the ſegments S T and K L (it is plain that S T = K L) of the tangents terminated by the aſymptotes; then I R is called a ſecond diameter of the hyperbolas, and the extremities of it are called the vertices of the ſecond diameter.

But the word diameter is often uſed to ſignify a ſtraight line drawn through the centre of an ellipſe or oppoſite hyperbolas, without regard to the magnitude of ſuch line.

XVII. A ſtraight line, terminated by two oppoſite hyperbolas and biſected by a ſecond diameter, is ſaid to be ordinately applied to that diameter; or it is called a double ordinate, and the half of it, an ordinate.

XVIII. Two diameters of an ellipſe, or of oppoſite hyperbolas, that are mutually parallel to the ordinates of one another, are called conjugate diameters, or they are ſaid to be conjugate to one another.

Prop. XXIV.

If a diameter of an ellipſe, or of oppoſite hyperbolas, be parallel to the ordinates of another diameter, theſe two are conjugate diameters.

The demonſtration of this propoſition, in the caſe of the hyperbola, is manifeſt from *Prop.* 20th; for the ordinates of a tranſverſe diameter of a hyperbola are parallel to a tangent at a vertex of the diameter, *Cor.* 1. *Pr.* 16.

Fig. 33. *Plate* V. In the ellipſe, let the diameter E D be parallel to P Q S an ordinate of the diameter F H; draw the diameter P R and join S R cutting E D in T. Becauſe P Q = Q S, and P G = G R; therefore S R is parallel to F H. And becauſe E D is parallel to P Q S, and P G = G R; therefore R T = T S. Therefore R S is an ordinate of the diameter E D, *Def.* XIV, and it is parallel to F H; therefore E D and F H are conjugate diameters, *Def.* XVIII.

Cor. It a diameter of an ellipſe, as E D, be parallel to F O, a tangent at a vertex of another diameter F H; then F H is parallel to D I, a tangent at a vertex of E D.

For a tangent at a vertex of a diameter is parallel to the ordinates of that diameter.

Def. XIX. When a ſtraight line drawn through a point, ſituated within or without a cone, meets one, or both, of the conic ſurfaces in two points, it is called a ſecant; and the two parts of ſuch a line, between the point through which it is drawn and the conic ſurface or ſurfaces, are called the ſegments of the ſecant. And when a line, drawn from a point without a cone, touches one of the conic ſurfaces; that part of it between the point from which it is drawn and the conic ſurface is denoted by the word tangent in the following propoſitions.

Prop. XXV. *Fig.* 34, 35, and 36.

If a ſtraight line be drawn from the vertex of a cone to a point, as B, in the plane of the baſe, but not in the periphery of the baſe; and, through any point, as P, ſituated without or within the cone, another ſtraight line, parallel to the former, be drawn to cut or touch the conic ſurface, or oppoſite ſurfaces; then the ſquare of the line drawn from the vertex of the cone to the point B is to the rectangle under the ſegments of the ſecant, or to the ſquare of the tangent, drawn from the point P, as the rectangle under the ſegments of any line drawn from B to cut the baſe of the cone, is to the rectangle under the ſegments of any line, parallel to the baſe of the cone, drawn through the point P, to cut the conic ſurface.

Fig. 34. Let the point B be without the baſe of the cone, and let Q R, drawn through P without or within the conic ſurface, be parallel to V B, and let it cut the conic ſurface in Q and R: through P and the line V B draw a plane cutting the conic ſurface in the lines V G and V H, and the plane of the baſe in the line B G H; and through P draw L K parallel to G H. Becauſe V B and P Q R are parallel, therefore the line P Q R is contained in the plane B V P, 7. 11. E; and the points Q and R are in the lines V H and V G, the common ſections of the plane and the conic ſurface. Becauſe Q P is parallel to V B and L K to G H, therefore the triangle Q P L is equiangular to the triangle V B H, and the triangle P K R to the triangle V G B: therefore 4. 6. E.

$$VB : PR :: BG : PK$$

$$VB : PQ :: BH : PL$$

Conſequently, $VB^2 : PR \times PQ :: BG \times BH : PK \times PL$, 23. 6. E. But the rectangle B G × B H is equal to the rectangle under the ſegments of any other line drawn from B to cut the baſe of the cone, 35 and 36. 3. E; and the rectangle P K × K L is equal to the rectangle under the ſegments of any other line, parallel to the plane of the baſe, drawn from P to cut the conic ſurface, *Cor. Pr.* 5; and hence the proportion is manifeſt in this caſe.

Fig. 35. And if the point B be within the baſe of the cone, and a ſtraight line (as P Q R), parallel to the line

V B that joins the point B and the vertex of the cone, be drawn to cut the oppoſite ſurfaces through a point P ſituated without or within the cone: the propoſition may be demonſtrated in this caſe, in the very ſame words as in the former caſe.

Fig. 36. And if the point P be without the cone as well as the line V B, and P S, parallel to V B, be drawn to touch the conic ſurface, inſtead of cutting it; then the plane P V B will meet the conic ſurface in a line V S M; and B M will touch the baſe of the cone, and P N, parallel to B M, will touch the conic ſurface. And becauſe the two triangles S P N and V B M are equiangular, therefore,

$$VB : PS :: BM : PN$$

$$\text{And } VB^2 : PS^2 :: BM^2 : PN^2$$

But BM^2 is equal to the rectangle under the ſegments of any line drawn from B to cut the baſe of the cone; and PN^2 is equal to the rectangle under the ſegments of any line, parallel to the baſe of the cone, drawn from P to cut the conic ſurface; and hence the propoſition is manifeſt in this caſe alſo.

Prop. XXVI. *Fig.* 37.

If a point be aſſumed without or within a cone, and two lines be drawn through it to meet a conic ſurface, or oppoſite ſurfaces, and ſo as to be parallel to two ſtraight lines given by poſition; then the rectangle under the ſegments of the ſecant, or the ſquare of the tangent, parallel to one of the lines given by poſition, has to the rectangle under the ſegments of the ſecant, or to the ſquare of the tangent, parallel to the other line given by poſition, a ratio that is conſtantly the ſame, wherever the point (from which the lines are drawn) is aſſumed without or within the cone.

Fig. 37. Let V B and V C be two ſtraight lines, drawn from the vertex of a cone to the plane of the baſe, and given by poſition (or parallel to lines given by poſition); and let P Q and M N be two ſtraight lines drawn through any aſſumed point, as R, to cut the conic ſurface, and ſo as to be reſpectively parallel to C V and V B: and as CV^2 is to the rectangle $CK \times CL$ (contained by the ſegments of any line drawn from C to cut the baſe of the cone), ſo let D, any aſſumed line, or magnitude, be to E; and as VB^2 is to $BG \times BH$ (the rectangle contained by the ſegments of any line drawn from B to cut the baſe of the cone), ſo let F be to E; and draw S T parallel to the baſe of the cone through the point R; then, *Pr.* 24.
$(CV^2 : CK \times KL$, or$)\ D : E :: PR \times RQ : SR \times RT$, and $BV^2 : BG \times GH$, or$)\ F : E :: MR \times RN : SR \times RT$. Therefore invertendo and ex æquo,

$$D : F :: PR \times RQ : MR \times RN.$$

And, as the ſame reaſoning applies wherever the point R is aſſumed, therefore the ratio of the rectangles $PR \times RQ$, and $MR \times RN$ is the ſame with, or equal to, the conſtant ratio of D to F, wherever the point R is aſſumed.

And, in like manner, may the propoſition be demonſtrated in all other caſes, or in all poſitions of the lines P Q, and M N, whether they cut, or touch, the ſame or oppoſite ſurfaces.

Prop. XXVII. *Fig.* 38.

If a point be aſſumed in the curve of an hyperbola, and a ſtraight line be drawn through it to cut both the aſymptotes; the rectangle, contained by the ſegments intercepted between the point in the curve and the aſymptotes, will be equal to the ſquare of the ſemidiameter to which the ſtraight line is parallel.

Firſt, let the ſtraight line E M N, drawn through E in the curve of a hyperbola and cutting the aſymptotes in M and N, be parallel to the tranſverſe diameter, G H; join H E, and produce it to meet the aſymptotes in R and S: it is obvious that the triangle R G H is equiangular to the triangle R E N, and the triangle G H S to the triangle S E M; therefore, 4. 6. E.

$$NE : ER :: GH : HR$$

$$SH : GH :: SE : EM$$

And, becauſe $SH = ER$, and $SE = HR$, *Pr.* 22. therefore,

$$\text{ex æquo } NE : GH :: GH : EM$$

$$\text{conſequently, } ME \times EN = GH^2,\ 17.\ 6.\ E.$$

Next, when the line is parallel to a ſecond diameter. And if it touch the curve at the point H through which it is drawn, as K L; then the two ſegments, K H, and H L, are equal to one another, *Pr.* 13, and to the ſemidiameter G P, to which K L is parallel, *Def.* XVI; whence the propoſition is manifeſt. But if a line, as D F, drawn through the point of the curve, E, parallel to the ſecond diameter G P, do not touch the hyperbola, let K L, parallel to G P, touch the hyperbola in H, and join H E, cutting the aſymptotes in R and S. Becauſe K L and D F are parallel (being, both, parallel to G P), therefore the triangles, R H L, and K H S, are reſpectively equiangular to the triangles R E F and D E S; therefore,

$$FE : ER :: HL : HR$$

$$SH : HR :: SE : ED$$

And, becauſe $SH = ER$ and $SE = HR$, therefore,

$$\text{ex æquo } FE : HK :: HL : ED$$

$$\text{conſequently, } FE \times ED = HK \times HL = GP^2.$$

Cor. If any number of ſtraight lines, all parallel to one another, meet the two aſymptotes and the hyperbola or oppoſite hyperbolas; the rectangles contained by the ſegments of the parallels, intercepted between the aſymptotes and the curve, will be all equal to one another.

For each of the rectangles is equal to the ſquare of the ſemidiameter drawn parallel to the lines.

Prop. XXVIII. *Fig.* 38.

If a point be aſſumed without or within a conic ſection, and two ſtraight lines be drawn through it to cut or touch the ſection or oppoſite ſections, and ſo as to be parallel to two lines given by poſition; then the rectangle under the ſegments of the ſecant, or the ſquare of the tangent, parallel to one of the lines given by poſition, will have to the rectangle under the ſegments of the ſecant, or to the ſquare of the tangents parallel to the other line given by poſition, a ratio that is always the ſame, wherever the point (through which the lines are drawn), is aſſumed without or within the ſection. And in the ellipſe and hyperbola, or oppoſite hyperbolas, the conſtant ratio is equal to that of the ſquares of the diameters drawn parallel to the lines given by poſition.

For ſecants and tangents of a conic ſection are ſecants and tangents of a conic ſurface, and thus the firſt part of this propoſition is included in propoſition 25.

And becauſe the diameters of an ellipſe interſect in the centre, and are biſected there, *Pr.* 14; therefore the ratio of the rectangles under the ſegments of the ſecants, is, in this caſe, the ſame with the ratio of the ſquares of the ſemidiameters, or the ſame with the ratio of the ſquares of the diameters themſelves: and thus the ſecond part of the propoſition, in as much as it regards the ellipſe, is manifeſt from the firſt part.

It remains to demonſtrate the ſecond part of the propoſition in the caſe of the hyperbola. Aſſume any point, as F, (*fig.* 38.), in one of the aſymptotes, and through F draw

BI and CE (terminated by the hyperbola, or oppoſite hyperbolas), parallel to two ſemidiameters GP and GH; and let BI, and CE, or theſe lines produced, cut the other aſymptote in D and A. Becauſe $BA = FI$, *Pr.* 22; therefore $BF \times FI = BF \times BA = GH^2$; and, in like manner, $EF \times FC = DC \times CF = GP^2$, *Pr.* 27. Therefore the ratio of the ſquares of the ſemidiameters GH and GP, or the ratio of the ſquares of the diameters themſelves, is equal to the ratio of the rectangles $BF \times FI$ and $EF \times FC$. And becauſe the ratio of the rectangle $BF \times FI$ to the rectangle $EF \times FC$ is equal to the ratio of the rectangles under the ſegments of any lines terminated by the curve or curves that interſect one another, and are parallel to BI and FD (the ſquares of the tangents being taken when the lines touch the curve inſtead of cutting it), therefore, in the caſe of the hyperbola alſo, the ſecond part of the propoſition is manifeſt from the firſt part.

Cor. 1. If two tangents be drawn to an ellipſe, or a hyperbola, or oppoſite hyperbolas, from the ſame point, then theſe tangents are proportional to the diameters, or ſemidiameters, drawn parallel to the tangents.

For the ſquares of the tangents are proportional to the ſquares of the diameters.

Cor. 2. If a right line be ordinately applied to a diameter of an ellipſe, or to a tranſverſe diameter of a hyperbola; then as the ſquare of the diameter is to the ſquare of the conjugate diameter, ſo is the rectangle contained by the abſciſſes of the diameter, between the vertices and ordinate, to the ſquare of the ordinate.

For the double-ordinate is biſected by the diameter, and it is parallel to the conjugate diameter.

Prop. XXIX. *Fig.* 39.

If an ordinate be drawn to a ſecond diameter of oppoſite hyperbolas; the ſquare of this ſecond diameter is to the ſquare of the conjugate diameter, as the ſum of the ſquares of the ſecond diameter, and of the part of it between the centre and the ordinate, is to the ſquare of the ordinate.

Let PQ (*fig.* 39.) be a ſecond diameter of two oppoſite hyperbolas, and FH the diameter conjugate to it, and let MO be an ordinate to PQ: draw MN parallel to PQ; then MN will be an ordinate of the diameter FH; *Def.* XX.

Therefore, $GH^2 : GP^2 :: FN \times NH$, or $GN^2 - GH^2 : MN^2$, *Cor.* 2. *Pr.* 27:
therefore $GH^2 : GP^2 :: GN^2$, or $MO^2 : GP^2 + MN^2$ 12. 5. E. and invertendo, $GP^2 : GH^2 :: GP^2 + MN^2 : MO^2$.

Prop. XXX. *Fig.* 40.

If a right line, as PT, drawn through a point P in the ſurface of a cone ſo as to be parallel to a right line VB contained in the conic ſurface, meet two parallel lines (in the points R and S) that cut or touch the conic ſurface or oppoſite ſurfaces: then PR is to PS as the rectangle under the ſegments of the ſecant, or the ſquare of the tangent, drawn through the point R, is to the rectangle under the ſegments of the ſecant or to the ſquare of the tangent, drawn through the point S.

Through the two parallels PT and VB (*fig.* 40.) draw a plane cutting the conic ſurface again in the line VA, and the plane of the baſe in the line BA; and, through R and S, draw MN and HG parallel to AB. Becauſe PT is parallel to VB and RN to SG, therefore RNGS is a parallelogram; and $RN = GS$. It is obvious that the triangles PMR and PHS are equiangular: therefore PR is to PS as MR is to HS, 4. 6. E, or as $MR \times RN$ is to $HS \times SG$, 1. 6. E. But $MR \times RN$ and $HS \times SG$ are reſpectively equal to the rectangles contained by the ſegments of any two lines, parallel to the baſe of the cone, drawn through R and S to cut the conic ſurface, *Cor. Pr.* 5. and hence the propoſition is manifeſt, when PT meets two lines parallel to the plane of the baſe.

And if PT meet two parallel lines DE and IK, not parallel to the plane of the baſe; then, let the ſame conſtruction be made as before: and becauſe DE is parallel to IK, and MN to GH; therefore,

$DR \times RE : MR \times RN :: IS \times SK : HS \times SG$;

Alternando, $DR \times RE : IS \times SK :: MR \times RN : HS \times SG$. Therefore, as is obvious from what has already been ſhewn,

$$PR : PS :: DR \times RE : IS \times SK.$$

And if S be without the cone and the line drawn through it touch the conic ſurface inſtead of cutting it, the reaſoning is ſtill the ſame, when the ſquare of the tangent is taken in place of the rectangle under the ſegments of the ſecant.

Prop. XXXI.

If two points be aſſumed in the diameter of a parabola, or in a right line drawn through a point in the curve of an hyperbola parallel to one of the aſymptotes, and two parallel lines be drawn from theſe points to cut, or touch, the curve or oppoſite curves; then, as the rectangle under the ſegments of the ſecant or the ſquare of the tangent, drawn from one of the aſſumed points, is to the rectangle under the ſegments of the ſecant, or to the ſquare of the tangent, drawn from the other aſſumed point, ſo is the ſegment of the diameter of the parabola, or of the line parallel to the aſymptote, between the firſt aſſumed point and the curve, to the ſegment of the ſame line between the ſecond aſſumed point and the curve.

Becauſe all the diameters of a parabola, *Def.* XIII. and all the ſtraight lines drawn parallel to an aſymptote of a hyperbola, *Cor.* 2. *Def.* XV. are parallel to a right line contained in the conic ſurface; and becauſe ſecants, and tangents of a parabola, or a hyperbola, are ſecants and tangents of a conic ſurface: therefore it is manifeſt that this propoſition is included in the laſt propoſition.

Cor. The ſquares of the ordinates drawn to a diameter of a parabola are proportional to the abſciſſes of the diameter between the ordinates and the vertex.

Fig. 43. For the double ordinates of a diameter of a parabola, as GFD and LKE are parallel to one another; *Cor. Def.* XVII. therefore, by this propoſition,

$GF \times FD$, or $GF^2 : LK \times KE$, or $LK^2 :: AF : AK$.

Prop. XXXII. *Fig*, 41, 42, and 43.

If an ordinate be drawn to a diameter of a conic ſection, which is not a ſecond diameter of a hyperbola: then, in the ellipſe, the ſquare of the ordinate is equal to a rectangle contained by an abſciſs of the diameter and a conſtant line, deficient by a rectangle ſimilar to that contained by the conſtant line and the diameter; and, in the hyperbola, the ſquare of the ordinate is equal to a rectangle contained by an abſciſs of the diameter, and a conſtant line, exceeding by a rectangle ſimilar to that contained by the conſtant line and the diameter: and in the parabola, the ſquare of the ordinate is equal to a rectangle contained by the abſciſs of the diameter and a conſtant line.

Let AB (*fig.* 41 and 42.) be a diameter of an ellipſe, or a tranſverſe diameter of a hyperbola, FG an ordinate of it, and DE the conjugate diameter; draw AH perpendicular to AB and equal to a third proportional to AB and DE, and join B H: draw F L parallel to A H, and complete the parallelograms A K, F N and A M. It is obvious that B A is to A H as B F is to F L, 4. 6. E, or as $BF \times FA$ is to $FL \times FA$ or the rectangle F N, 1. 6. E. And becauſe A H is a third proportional to B A and E D, therefore,

$BA : AH :: BA^2 : DE^2$, *Cor.* 2, 20. 6. E. $:: AF \times FB : FG^2$. *Cor.* 2. *Pr.* 28.

Therefore,

$AF \times FB : FG^2 :: AF \times FB :$ rect. F N, 14. 5. E.

Therefore $GF^2 =$ rectangle F N. Now, in the ellipſe, the rectangle F N is deficient from the rectangle A M, contained by the abſciſs A F and the line A H (which is the ſame for all the ordinates) by the rectangle N M, ſimilar to the rectangle A K, contained by A H and A B; and, in the hyperbola, the rectangle F N exceeds the rectangle A M by the rectangle N M, ſimilar to the rectangle A K.

In the parabola (*fig.* 43.) let one ordinate of a diameter be pitched upon, as L K, and take A H, a third proportional to the abſciſs A K and the ordinate L K; then, if F G be any other ordinate,

$LK^2 : FG^2 :: AK : AF$, (*Cor. Pr.* 31) $:: AK \times AH : AF \times AH$.

And becauſe $LK^2 = AK \times AH$, therefore $FG^2 = AF \times AH$, the rectangle contained by the abſciſs A F and the line A H, which is the ſame for all the ordinates of the diameter.

Def. XX. The conſtant line A H is called the parameter of the diameter A B; and, in the ellipſe and hyperbola, it is a third proportional to the diameter A B, and the conjugate diameter D E; but, in the parabola, it is a third proportional to the abſciſs of any one ordinate of a diameter, and the ordinate itſelf.

Scholium.

The phraſes "deficient" and "exceeding by a rectangle ſimilar to another rectangle," occur in Euclid's Elements, 27 and 28. 6. E. although they are now generally diſuſed by geometricians; and, it muſt be confeſſed, they are far from expreſſing the meaning they are intended to convey, in a ſimple and perſpicuous manner. Theſe expreſſions have been uſed in enunciating this propoſition, with the view of drawing the attention to the diſtinguiſhing circumſtances from which the ſeveral conic ſections derived their names. For Apollonius gave the name of the ellipſe to one of theſe curves, on account of the defect of the ſquare of the ordinate from the rectangle contained by the abſciſs and the parameter: and he called another of them an hyperbola, from the exceſs of the ſame ſquare above the ſame rectangle; and the third a parabola, on account of the exact equality of the ſame two ſpaces.

Prop. XXXIII. *Fig.* 44. *Plate* VI.

Let a ſcalene cone be cut by a plane drawn through the axis perpendicular to the plane of the baſe, making the triangular ſection V A B; and let V D, cutting A B produced, in D, be drawn ſo as to make the angle B V D equal to the angle V A B; and let I E be drawn in the plane of the baſe perpendicular to A D: then, if a point be aſſumed in the plane of the baſe of the cone, but without the baſe, the ſquare of the line drawn from that point to the vertex of the cone is greater than, or equal to, or leſs than, a rectangle contained by the ſegments of any line drawn from the ſame point to cut the baſe of the cone, according as the aſſumed point is on the ſame ſide of the line I E as the baſe of the cone, or in the line I E, or on the oppoſite ſide of the line I E.

For, let I be any point in the line I E, and draw I V to the vertex, and I K to cut the baſe of the cone through the centre C. Becauſe the angle B V D is equal to the angle B A V, therefore V D is a tangent of a circle deſcribed about the triangle A V B, 32 3. E.; therefore $VD^2 = AD \times DB$ (36. 3. E.) $= DC^2 - CB^2$, 6. 2. E.: to theſe equals add DI^2; and $VD^2 + DI^2 = DC^2 + DI^2 - CB^2$. But it is evident that D I is perpendicular to the plane A V D; therefore, $VD^2 + DI^2 = VI^2$, 47. 1. E.; and $DC^2 + DI^2 - CB^2 = IC^2 - CL^2 = KI \times IL$, 6. 2. E. Therefore, $KI \times IL = VI^2$.

Secondly, let M be a point, without the baſe of the cone, and on the ſame ſide of the line, I E, as the baſe; and, let a plane drawn through M V, and the centre of the baſe, cut the cone in the triangle, K V L, and the plane of the baſe in the line K L M: produce K M to meet I E in I, and draw I V. It has been ſhewn that $IV^2 = IK \times IL$; therefore, if a circle be deſcribed about the triangle K V L, V I will be a tangent of that circle (32. 3. E.), and the line V M, will cut its periphery in a point *m*, ſituated between V and M; and becauſe V, *m*, L, and K are points in the ſame circle, therefore $VM \times Mm = KM \times ML$, 36. 3. E. But VM^2 is greater than $VM \times Mm$; therefore it is alſo greater than $KM \times ML$.

Thirdly, let N be a point in the plane of the baſe of the cone on the oppoſite ſide of the line I E; and, the ſame conſtruction being made as before, it is manifeſt that V N will be entirely without the circle deſcribed about the triangle K V L (of which V I is a tangent); and that V N, when produced, will cut the periphery as at *n*; then $nN \times NV = NK \times NL$. But NV^2 is leſs than $nN \times NV$; therefore it is leſs than $NK \times NL$.

Cor. If I be a point in the plane of the baſe of the cone, ſuch that $IV^2 = IK \times IL$: then I is a point in the line found in the manner deſcribed in the enunciation of this propoſition.

Prop. XXXIV. *Fig.* 45.

If a ſcalene cone be cut by a plane perpendicular to the plane of the baſe, making the triangular ſection V A B; and let I E be the line found in the laſt propoſition; alſo, let the cone be cut by a plane, making an elliptical ſection, P F Q H, the *determining line* of which, M N, is parallel to the line I E; and let F H be the diameter of the ſection that is parallel to M N. Then, if M N fall between the baſe of the cone and I E, F H is the leaſt diameter of the ſection; and, if M N fall upon I E, all the diameters of the ſection are equal to F H and to one another; and if F H fall on the oppoſite ſide of I E to the baſe of the cone, F H is the greateſt diameter of the ſection.

Let R S be any diameter of the ſection different from F H, and draw V K (meeting M N in K) parallel to R S; and let K L T cut the baſe of the cone. Becauſe R S and H F are biſected in the centre G, therefore,

$RG^2 : HG^2 :: VK^2 : KL \times KT$, *Pr.* 25.

Now, if M N fall between the baſe of the cone and I E, then VK^2 is greater than $KT \times KQ$, *Pr.* 33; therefore R G is greater than H G; and, in this caſe, F H is the leaſt diameter of the ſection.

And, if M N fall upon I E, then $VK^2 = KT \times KL$; therefore $RG = HG$; and, in this caſe, the ſection is a circle.

And, laſtly, if M N be on the other ſide of I E to the baſe, then KV^2 is leſs than $KT \times KL$; therefore R G is leſs than H G; and, in this caſe, F H is the greateſt diameter of the ſection.

Cor. 1. If a ſection of a cone, not parallel to the plane of the baſe, be a circle, then I E, the line found in *Prop.* 32, is the *determining line* of that ſection.

For $RG^2 : HG^2 :: KV^2 : KT \times KL$.

And, becauſe the ſection is a circle, therefore $RG = HG$; therefore $KV^2 = KT \times KL$; therefore K is a point in the line I E, *Cor. Pr.* 25. And, in like manner, it may be ſhewn that every point of the *determining line* of the ſection is in the line I E.

Cor. 2. Let P Q be the common ſection of the plane V A B, and the plane of the ellipſe; then PQ is a diameter of the ellipſe. It is manifeſt that M N is perpendicular to the plane V A B; therefore F H, parallel to M N, is perpendicular to the ſame plane and to P Q. Alſo P Q and F H are conjugate diameters, *Pr.* 17. Therefore, when the plane V A B is perpendicular to the plane of the baſe, F H, the diameter of the ellipſe, parallel to the baſe of the cone, cuts its conjugate diameter, P Q, at right angles.

Scholium.

If F P Q H be a ſection of the cone, of which I E is the *determining line*, it is plain that P Q is parallel to V D; therefore, the angle $VQP =$ angle $BVD =$ angle V A B. Therefore, the triangle P V Q is ſimilar to the triangle B A V; but the angles at the baſe of the one triangle have a ſub-contrary poſition to the equal angles at the baſe of the other triangle. For this reaſon a ſection of a cone that has the line I E (found as in *Prop.* 32.) for its *determining line*, is called a ſub-contrary ſection.

The word ellipſe has hitherto been uſed to denote, generally, thoſe ſections of a cone which have their *determining lines* without the baſe of the cone; but, as it has been ſhewn that the conic ſection is a circle in one particular caſe (*viz.* the ſub-contrary ſection) included in this general definition, preciſion requires that the term ellipſe be hereafter reſtricted in its ſignification, ſo as to exclude that particular caſe.

Prop. XXXV. *Fig.* 46.

An ellipſe being given, it is required to draw a diameter of it that ſhall be equal to F H, the diameter which is parallel to the baſe of the cone; but the plane V A B, drawn through the vertex of the cone, and that diameter of the baſe which is perpendicular to the *determining line* of the ellipſe, muſt not be perpendicular to the plane of the baſe of the cone.

Draw the line I E, as in propoſition 32. And becauſe I E and M N are perpendicular to two different diameters of the baſe of the cone, they are not parallel: let them meet in K, and draw V K, and the diameter R S, parallel to V K; then $FH = RS$. For, becauſe R S and F H are biſected in the centre G, therefore,

$$VK^2 : KT \times KL :: FG^2 : RG^2, \text{ Pr. } 24.$$

But $VK^2 = KT \times KL$; therefore, $FG = RG$.

Cor. Only one diameter can be drawn that ſhall be equal to F H.

For, if $FH = RS$, then $VK^2 = KT \times KL$; therefore, K is in the line I E; and I E can meet M N only in one point.

Def. XXI. A diameter of a conic ſection, that cuts its ordinates at right angles, is called an axis.

Cor. Becauſe two conjugate diameters of an ellipſe, and oppoſite hyperbolas, cut their ordinates in the ſame angles, *Pr.* 24.; therefore, if theſe become axes of theſe curves, there will neceſſarily be two; and theſe will be conjugate diameters, and they will cut one another at right angles.

Prop. XXXVI. *Fig.* 47 and 48.

An ellipſe has only two axes.

Let F H (*fig.* 47.) be the diameter of the ellipſe drawn parallel to the baſe of the cone; and, firſt, let F H be the greateſt or the leaſt diameter of the ellipſe, *Pr.* 34.; then, it has already been ſhewn, that F H cuts its conjugate PQ at right angles, *Cor.* 2 *Pr.* 34.; and, therefore, F H and P Q are axes of the ellipſe, *Cor. Def.* XXI. Alſo they are the only axes of the ellipſe. For, let X Y be any other diameter, then X Y is not perpendicular to F H; draw F Z O, (cutting the ellipſe again in O) perpendicular to X Y, and draw G O. Becauſe F H is the greateſt or leaſt diameter of the ellipſe; therefore, F G is not equal to G O; therefore, F Z is not equal to Z O, 47. 1. E. Therefore F O, perpendicular to X Y, is not an ordinate of X Y; therefore, X Y is not an axis.

Secondly, when F H is not the greateſt or leaſt diameter of the ellipſe, draw the diameter R S equal to F H, *Pr.* 35.; and draw the diameter L K and D E to biſect the angles contained by F H and R S; join F S. And, becauſe L K biſects the angle at the vertex of the iſoſceles triangle F G S, it will biſect the baſe F S, and will cut it at right angles. And becauſe L K cuts F S, one of its ordinates at right angles, therefore L K is an axis; and, it is plain, that D E, parallel to F S, is another axis and the conjugate of L K. Alſo, L K and D E are the only axes of the ellipſe. For, let X Y be any other diameter; then X Y is not perpendicular both to F H and to R S; let it be not perpendicular to F H, and draw F Z O (cutting the ellipſe again in O) perpendicular to X Y, and join G O. Becauſe R S is the only diameter of the ellipſe that is equal to F H, *Cor. Pr.* 35.; therefore F G is not equal to G O; therefore F Z is not equal to ZO. And becauſe F O, perpendicular to X Y, is not an ordinate of X Y, therefore X Y is not an axis.

Prop. XXXVII. *Fig.* 49.

A hyperbola has only two axes.

Let G F and G K be the aſymptotes of the hyperbola, and draw the tranſverſe diameter G A to biſect the angle of the aſymptotes, and the ſecond diameter D E to biſect the adjacent angle; let F K, drawn between the aſymptotes, be perpendicular to G A, and meet the hyperbola in M and N. Becauſe F K is perpendicular to G L, and the angle $FGL =$ the angle K G L, therefore $FL = LK$, 26. 1. E. But $FM = NK$, *Pr.* 22.; therefore $ML = LN$. Therefore, M N perpendicular to G A, is an ordinate of G A; therefore, G A is an axis; and D E, parallel to M N, is the conjugate of G A, and another axis, *Pr.* 24.

And if G A do not biſect the angle F G K, then F K, perpendicular to G A, will not be biſected in L; therefore M L will not be equal to L N; therefore in this caſe, M N, perpendicular to G A, is not an ordinate of G A. Therefore, the hyperbola has no axes beſides G A and D E.

Prop. XXXVIII. *Fig.* 50.

A parabola has only one axis.

Let O S, terminated by the curve, be perpendicular to any diameter, and draw the diameter P Q to biſect O S; and, becauſe all the diameters of the curve are parallel, therefore, P Q is perpendicular to O S, and an axis of the curve, *Def.* XXI. And becauſe O S can be an ordinate of only one diameter, therefore there is only one axis.

Prop. XXXIX. *Fig.* 51 and 52.

The two axes of an ellipſe are always unequal; and the greater axis is the greateſt diameter, and the leſs axis the leaſt diameter of the curve. And that axis of a hyperbola, which is a tranſverſe diameter, is the leaſt of all the tranſverſe diameters.

Let A B and D E (*fig.* 51.) be the two axes of an ellipſe, C the centre, and C H any ſemidiameter; draw H P perpendicular to A B, and H Q perpendicular to D E. Becauſe A B and D E are conjugate diameters; and H P an ordinate to A B, and H Q an ordinate to D E; therefore,

$$AB^2 : DE^2 :: AP \times PB : HP^2,$$ *Cor.* 2. *Pr.* 28.

Now, if A B be ſuppoſed to be equal to D E, it will follow that $AP \times PB = HP^2$; therefore, $AP \times PB + CP^2 = HP^2 + CP^2$, or $AC^2 = CH^2$. Therefore, $AC = CH$; and the ellipſe will be a circle, which is not the caſe, *Cor.* 1. *Pr.* 33. Therefore, A B and D E are unequal; let A B be ſuppoſed to be greater than D E.

Becauſe AB^2 is greater than DE^2, therefore $AP \times PB$ is greater than HP^2; and $AP \times PB + CP^2$, or AC^2, is greater than $HP^2 + PC^2$, or CH^2. Therefore the ſemi-axis A C is greater than any other ſemi-diameter H C.

In like manner,

$$DE^2 : AB^2 :: DQ \times QE : HQ^2.$$

Therefore $DQ \times QE$ is leſs than HQ^2; and $DQ \times QE + CQ^2$, or CD^2, is leſs than $HQ^2 + CQ^2$, or CH^2. Therefore the ſemi-axis D C is leſs than any other ſemi-diameter C H.

Fig. 52. In the hyperbola, a tangent of the curve drawn from the extremity of the axis C A, as A T, falls between the centre and the curve; and becauſe C A, the ſemi-axis, is leſs than any other line drawn from C to A T, much more is it leſs than a ſemi-diameter C H drawn from C to the curve on the other ſide of A T.

Definition XXII.

The greater axis of an ellipſe is called the tranſverſe axis; and the leſs, the conjugate axis; and, in the hyperbola, that one is the tranſverſe axis which is a tranſverſe diameter, and the other is the conjugate axis.

Prop. XL. *Fig.* 51 and 52.

A diameter of an ellipſe nearer the tranſverſe axis is greater than one more remote; and a tranſverſe diameter of the hyperbola nearer the tranſverſe axis is leſs than one more remote.

Fig. 51. Let C K and C H be two ſemi-diameters of an ellipſe; join H K, and draw A G parallel to H K; join C G and draw C L to biſect H K. Becauſe C L biſects H K, it will likewiſe biſect A G, *Pr.* 15. And becauſe $AM = MG$, and A C is greater than C G, therefore the angle A M C is greater than the angle G M C, 25. 1. E; that is, the angle K L C is greater than the angle H L C. And becauſe $HL = LK$, therefore K C, nearer to C A, is greater than H C more remote from C A, 24. 1. E.

In the hyperbola, the ſame conſtruction being made, becauſe A C is leſs than C G, therefore the angle A M C, or K L C, is leſs than the angle G M C, or H L C. Therefore C K is leſs than C H.

Definitions. *Fig.* 53, 54, and 55.

XXIII. Let A B (*fig.* 53 and 54.) be the tranſverſe axis, D E the conjugate axis, and C the centre of an ellipſe, or hyperbola, or oppoſite hyperbolas; and let C F and C*f* be taken in the tranſverſe axis, ſuch that CF^2 and Cf^2 are each equal to $CA^2 - CD^2$ in the ellipſe, and to $CA^2 + CD^2$ in the hyperbola; then the two points F and *f* are called the foci of the ellipſe, hyperbola, or oppoſite hyperbolas.

Fig. 55. But the focus of a parabola is a point F in the axis, within the curve, and diſtant from the vertex by a line equal to one fourth part of the parameter of the axis.

Cor. The diſtance of each of the foci of an ellipſe from either extremity of the conjugate axis is equal to half the tranſverſe axis; and the diſtance of either of the foci of a hyperbola from the centre is equal to the diſtance between the extremities of the tranverſe and conjugate axes.

XXIV. If F (*fig.* 53 and 54.) be a focus of an ellipſe, or hyperbola, or oppoſite hyperbolas, and A G be taken in the tranſverſe axis (on the oppoſite ſide of the vertex to the focus F), ſuch, that A F is to A G as C F is to C A; then a line, as H K, drawn through G perpendicular to the tranſverſe axis, is called a directrix of the ellipſe, or hyperbola, or oppoſite hyperbolas.

Fig. 55. But the directrix of a parabola is a line, as H K, perpendicular to the axis, drawn through a point G as far diſtant from the vertex of the axis on the one ſide as the focus is on the other ſide.

Cor. An ellipſe, hyperbola, or oppoſite hyperbolas, have two directrices; one correſponding to each focus. For the ſame conſtruction that is made for one focus, may be made for the other focus.

Prop. XLI. *Fig.* 53 and 54.

Let A B be the tranſverſe, and D E the conjugate, axis of an ellipſe, or hyperbola, or oppoſite hyperbolas; from any point in the curve, or oppoſite curves, as M, let M C be drawn to the centre, and M P perpendicular to the tranſverſe axis, and take C O, in the ſame axis, ſuch that CO^2 may be equal to $MC^2 - CD^2$ in the ellipſe, and to $MC^2 + CD^2$ in the hyperbola; then as A C is to C F ſo is P C to C O.

For, becauſe A B and D E are conjugate diameters, therefore,

$AC^2 : CD^2 :: AP \times PB : MP^2$, *Cor.* 2. *Pr.* 28, therefore, $AC^2 : AC^2 \mp CD^2 :: AP \times PB : AP \times PB \mp MP^2$. But in the ellipſe $AC^2 - CD^2 = CF^2$; and $AP \times PB - MP^2 = AC^2 - CP^2 - MP^2 = AC^2 - MC^2 = AC^2 - CD^2 - CO^2 = CF^2 - CQ^2$: and, in the hyperbola, $AC^2 + CD^2 = CF^2$; and $AP \times PB + MP^2 = -PC^2 - AC^2 + MP^2 = MC^2 - AC^2 = CO^2 - CD^2 = CA^2 = CO^2 - CF^2$. Therefore, the laſt analogy becomes,

$$AC^2 : CF^2 :: AC^2 \mp CP^2 : CF^2 \mp CO^2$$

Conſequently $AC^2 : CF^2 :: CP^2 : CO^2$ 19. 5. E.

$$\text{And } AC : CF :: CP : CO.$$

Prop. XLII. *Fig.* 53 and 54.

If M be a point in an ellipſe or hyperbola, and M F and M *f* be drawn to the foci; then, in the ellipſe, the ſum of M F and M *f* is equal to the tranſverſe axis; and, in the hyperbola, the difference of M F and M *f* is equal to the tranſverſe axis.

Draw M P perpendicular to the tranſverſe axis, and take C O as in the laſt propoſition. And, becauſe

$$AC : CF :: CP : CO,$$ *Pr.* 41.

Therefore $AC \times CO = FC \times CP$; and $4\,AC \times CO = 4\,CF \times FO$. But, becauſe A B and F *f* are biſected in C, therefore $4\,AC \times CO = BO^2 - AO^2$, 8. 2. E, and $4\,FC \times CP = Pf^2 - PF^2 = fM^2 - MF^2$, 47. 1. E; therefore $BO^2 - AO^2 = fM^2 - MF^2$.

Again, $MF^2 + Mf^2 = fP^2 + FP^2 + 2\,MP^2 = 2\,FC^2 + 2\,CP^2 + 2\,MP^2 = 2\,FC^2 + 2\,MC^2 = 2\,FC^2 \pm 2\,CD^2 + 2\,CO^2 = 2\,AC^2 + 2\,CO^2 = BO^2 + AO^2$.

And, becauſe $BO^2 + AO^2 = fM^2 + MF^2$, and $BO^2 - AO^2 = fM^2 - MF^2$; therefore, by adding the equals, $2\,BO^2 = 2\,fM^2$; and, by ſubtracting the equals, $2\,MF^2 = 2\,AO^2$. Therefore $fM = BO$, and $FM = AC$; whence the propoſition is manifeſt.

PROP. XLIII. *Fig.* 53, 54, and 55.

A ſtraight line drawn from any point in a conic ſection to a focus has to a perpendicular drawn to the correſponding directrix, a ratio that is conſtantly the ſame wherever the point is aſſumed in the curve; and, in the ellipſe, the conſtant ratio is a ratio of minority (or of a leſs magnitude to a greater); in the hyperbola, the conſtant ratio is a ratio of majority (or of a greater magnitude to a leſs); and, in the parabola, the conſtant ratio is a ratio of equality.

Fig. 53 and 54. Let M be a point in an ellipſe or hyperbola, and draw MF to a focus and MK perpendicular to the directrix HG, which correſponds to that focus; draw MP perpendicular to the tranſverſe axis and take CO as in *Prop.* 41. Then

$$AC : CF :: CP : CO, \textit{ Pr. } 41.$$

Invertendo, $CF : CA :: CO : CP$

Therefore $CF : CA :: FO : AP$, 19. 5. E

But $CF : CA :: AF : AG$, *Def.* XXIV.

Therefore $CF : CA :: AO : GP$, 12. 5. E

But, as has been ſhewn in the demonſtration of the laſt propoſition, $AO = MF$, and $GP = MK$; therefore

$$CF : CA :: MF : MK.$$

But the ratio of CF to CA is a conſtant ratio; and it is a ratio of minority in the ellipſe, and a ratio of majority in the hyperbola.

Fig. 55. In the parabola, $GA = AF$, and $4\,AF \times AP = MP^2$, *Def.* XXIII.; but $4\,AF \times AP = GP^2 - PF^2$, 8. 2. E; therefore $MP^2 = GP^2 - PF^2$; and $MP^2 + PF^2$, or $MF^2 = GP^2$, or MK^2. Therefore $MF = MK$.

Moſt branches of human learning take their origin from a few detached truths, viewed at firſt without connexion, and which, in the progreſs of knowledge, are at length joined together in one body of ſcience. But when a ſcience has riſen, by accumulated diſcoveries, to ſuch a degree of importance as to intereſt the curioſity of mankind, it is often too late to retrace its hiſtory, and to delineate its riſe and progreſs in an accurate and ſatisfactory manner. It generally happens that the authors of many of the ſubordinate diſcoveries have already fallen into oblivion; and that ſome important improvements are diſputed, and aſcribed to different inventors by different writers. In reviewing the hiſtory of the conic ſections, we muſt add, to the cauſes which commonly obſcure the origin of all the ſciences, the very high antiquity of this branch of the mathematics, and the loſs of the early geometricians who have written on it. No work of antiquity that profeſſedly treats of the hiſtory of the conic ſections has reached our time; and there is little to ſatisfy curioſity in this inquiry, excepting a few incidental notices collected from different authors.

The diſcovery of the curves, denominated the conic ſections, is attributed to the philoſophers of the ſchool of Plato; and it is even aſcribed, by ſome authors, to the founder, himſelf, of that celebrated ſect. Other authors, grounding their opinion on a few words in an epigram of Eratoſthenes, have given the honour of this diſcovery to Menechmus, who lived a little poſterior to the time of Plato. But the information derived from ancient writers is too ſcanty to enable us to decide concerning the original diſcoverer of the conic ſections, or to form a well-founded judgment of the reſpective inventions of the early mathematicians whoſe works have not come down to our time. We know nothing of Ariſtæus, or Conon the friend of Archimedes, excepting that they treated of the conic ſections; and that they deſerved the commendations of ſucceeding geometricians by improving and extending the branch of ſcience which they cultivated.

It is probable that the theory of the conic ſections, like other parts of ſcience, grew up gradually from a ſmall beginning, increaſing in magnitude and importance by the ſucceſſive improvements of many geometricians. New and difficult problems would naturally lead to new artifices and inventions for their ſolution; and they would thus contribute to the extenſion of knowledge. The hiſtory of the mathematics mentions two problems, famous in ancient times, much agitated by the geometricians of the Platonic ſchool, and both of them ſo difficult as to tranſcend the limits of the ordinary, or plane, geometry. We allude to the problems of the duplication of the cube, and the triſection of an angle; and there is no doubt but that the theory of the conic ſections received great additions, and was enriched with many new properties, by the reſearches that were undertaken for reſolving theſe problems. Two ſolutions of the former problem, derived from the conic ſections, are preſerved by Eutocius, in his commentary on the works of Archimedes, which are attributed by him to Menechmus. Some ſolutions of the latter problem, by means of the conic ſections, are likewiſe extant in ancient authors, for which ſcience is probably indebted to the ingenuity of the followers of Plato.

The teſtimony of ancient authors, as well as the ſolutions of the problems which we have juſt mentioned, lead us to infer that great progreſs had been made in inveſtigating the properties of the conic ſections before the time of Archimedes. This concluſion is confirmed by the writings of that celebrated mathematician. Many principal propoſitions are there expreſsly ſaid to have been demonſtrated by preceding writers, and are ſpoken of as truths commonly divulged and known to mathematicians. Archimedes himſelf, perhaps the greateſt genius of antiquity, and deſerving to be ranked with Galileo and Newton, enriched the theory of the conic ſections with many noble diſcoveries. After a lapſe of two thouſand years, the quadrature of the parabola is ſtill the moſt remarkable inſtance, within the precincts of geometry, of the exact equality of a curvilineal to a rectilineal ſpace. To this beautiful diſcovery there muſt be added, the determining of the proportions of the elliptic ſpaces to one another, and to the circle; and likewiſe the menſuration of the ſolids generated by the revolution of the conic ſections about their axes.

But we are chiefly indebted to the preſervation of the writings of Apollonius for a more perfect knowledge of the theories of the ancient geometricians concerning the conic ſections. Apollonius was born at Perga, a town of Pamphylia, and he is ſaid to have lived under Ptolemy Philopater, about forty years poſterior to Archimedes. He was inſtructed in geometry in the ſchool of Alexandria; and, under the ſucceſſors of Euclid, he there acquired that ſuperior ſkill in the ſcience which diſtinguiſhes his writings. Beſides his great work on the conic ſections, he publiſhed many ſmaller treatiſes, relating chiefly to the geometrical analyſis, which have all periſhed, and are known to us only by the account given of them in the ſeventh book of the mathematical collections of Pappus.

The treatiſe of Apollonius on the conic ſections is written

ten in eight books, and it was eſteemed a work of ſo much merit by his contemporaries as to procure for its author the title of the great geometrician. The purpoſe of the four firſt books, as we are informed in the prefatory epiſtle to Eudemus, is to deliver the elements of the ſcience: and, in this part of his work, Apollonius profeſſes only to have collected and methodized what had already been publiſhed by former writers. One improvement introduced by him deſerves to be particularly mentioned; as it is a curious inſtance of the progreſs of the mind in generalizing its firſt conceptions. The conic ſections, according to the definitions now given of them, are ſuch curves as are produced by the common ſection of a plane and a cone of whatever kind. But the firſt mathematicians who noticed theſe curves, did not define them in a way ſo general. They confined their attention to the right cone only; and, even in this kind of cone, they always ſuppoſed the cutting plane to be perpendicular to the ſlant ſide. In this view of the matter it is manifeſt, that the ſpecies of the curve would depend on the ſort of cone by which it was produced. If the vertical angle of the cone were ſuppoſed to be an acute-angle, then the cutting plane, perpendicular to the ſlant ſide, would meet one of the conic ſurfaces only, and the line of common ſection would ſurround the whole, and would be an ellipſe. If the vertical angle of the cone were ſuppoſed to be a right-angle, then the cutting plane would ſtill meet only one of the conic ſurfaces, but the line of common ſection, not embracing the whole contour of the ſolid, would, in this caſe, be a parabola: and, laſtly, if the vertical angle of the cone were ſuppoſed to be obtuſe, then the cutting plane would interſect both the oppoſite conic ſurfaces, and the curve produced would be a hyperbola. It is true that the curves, thus defined, were rightly denominated conic ſections, conſidering them as parts of a claſs; but it did by no means follow that they comprehended all the ſpecies of the claſs. Even retaining the right cone, yet curves of a different nature might poſſibly be produced merely by varying the inclination of the cutting plane: and much more ſo, if the ſpecies of the cone, and the poſition of the cutting plane, were both changed. To Apollonius belongs the honour of having generalized the ancient definitions of the conic ſections, and of preſenting the ſubject in the more perfect form in which it ſtill continues to be taught: and the improvement is equivalent to the diſcovery that all the poſſible ſections of any cone, are reducible to three diſtinct ſpecies and no more.

Before the time of Apollonius, the names of the ſeveral conic ſections were likewiſe different from thoſe that they now bear. In conformity to the ancient definitions of the curves, the ellipſe was called the ſection of an acute-angled cone by the more early geometricians: and, in like manner, the parabola, and hyperbola, were denominated the ſections of a right-angled, and obtuſe-angled, cone. The preſent names are commonly ſuppoſed to have been invented by Apollonius; and, in compliance with the generality of writers, we have noticed the properties from which he derived them. But the received opinion on this point is probably not well founded: for both the terms, parabola and ellipſe, occur in the writings of Archimedes, which were prior to the time of Apollonius.

The four firſt books of the conics of Apollonius is the only part of that work that has come down to us in the original Greek. On the revival of learning, the lovers of the mathematics had long to regret the loſs of the original of the latter part of this important treatiſe. In the year 1658, Borelli, paſſing through Florence, found an Arabic manuſcript in the library of the Medici family, which he judged to be a tranſlation of all the eight books of the conics of Apollonius. Tranſported with joy, he had intereſt enough to prevail on the duke of Tuſcany to entruſt him with the manuſcript, which he carried to Rome: and, having procured the aſſiſtance of Abraham Ecchellenſis, a perſon ſkilled in the Arabic tongue, he publiſhed a Latin tranſlation of it in 1661. The manuſcript, diſcovered by Borelli, was entitled, "Apollonii Pergæi Libri Octo," and was ſuppoſed to be a complete tranſlation of the work of the ancient geometrician: but, on examination, it was found to contain the firſt ſeven books only. Two other Arabic tranſlations of the conics of Apollonius have been diſcovered by the induſtry of learned men: but both of them have the ſame defect as that found at Florence. From the circumſtance of all the three manuſcripts agreeing in the want of the eighth book, it is reaſonable to ſuppoſe that this part of the treatiſe had already periſhed when the tranſlations were written: and there is now no room to hope that the loſs will ever be recovered. It is not eaſy to aſcertain in what age the original of Apollonius's work diſappeared; but we know that the whole of it was extant in the time of Pappus Alexandrinus. In the "Collectiones Mathematicæ," this author has given a ſuccinct account of the contents of all the eight books, and has added the lemmas required for the demonſtrations of the propoſitions they contain: and this circumſtance enabled Dr. Halley to annex, to the complete edition of the conics of Apollonius, which he publiſhed in 1710, a reſtoration of the eighth book executed with ſo much ability as to leave little room to regret the want of the original.

In the four laſt books of his treatiſe, Apollonius, as he informs us in the prefatory epiſtle, delivers the higher and more abſtruſe parts of the theory of the conic ſections. He here claims the merit of originality, and profeſſes to develope the reſults of his own reſearches. And it muſt be confeſſed that the genius, invention, and geometrical ſkill, diſplayed in this part of his work, are ſuch as fully to juſtify the honourable appellation beſtowed on him by his contemporaries. This treatiſe muſt be allowed, even in the preſent times, to contain a very extenſive, if not a complete, theory of the conic ſections. This branch of the mathematics has, perhaps, been more cultivated than any other, ſince the revival of learning; but the induſtry of modern mathematicians has diſcovered few properties of their curves, of which ſome traces are not to be found in the work of the great geometrician. Montucla thus delivers his opinion of the treatiſe of Apollonius: "Pour donner enfin de l'ouvrage d'Apollonius l'idée qu'il mérite, je remarquerai que nous avons dans notre langue, et en ſtyle algebrique, un traité des ſections coniques dont on fait cas avec juſtice; je veux parler de celui de M. le marquis de l'Hôpital: cependant je ne craindrai point de dire qu'il y a dans le géomètre ancien un theorie bien plus ètendue et plus complete de les courbes que dans le géomètre moderne."

The mathematicians, who followed Apollonius, ſeem to have been content with the humble taſk of commenting on his treatiſe. It would be unintereſting to enumerate the crowd of commentators who, at different times, have written on his work, and have endeavoured to render it of more eaſy acceſs to the general claſs of mathematicians. Among the number we find the name of the learned Hypatia, the daughter of Theon: and we ſtill poſſeſs the lemmas of Pappus Alexandrinus for all the eight books, and the commentary of Eutocius on the four firſt books. Since the revival of learning, the theory of the conic ſections has been much cultivated, and is the ſubject of a great variety of ingenious works.

There is a relation ſubſiſting between all the parts of human knowledge, which frequently connects ſpeculations the moſt abſtracted, and ſeemingly the moſt barren, with inquiries that are highly intereſting to us, and moſt fertile in uſeful conſequences. In ſtudying the properties of the conic ſections, the followers of Plato ſought merely to gratify a contemplative turn of mind. Their reſearches were chiefly undertaken with the view of reſolving ſpeculative problems; they were directed to no immediate object of practical utility. It excites ſome degree of admiration, when we reflect that enquiries, purely intellectual, and apparently ſo little connected with external things, have, in modern times, been employed to explain many of the moſt remarkable phenomena of the material world. The doctrine of the conic ſections is equally uſeful in the ſcience of optics, and in determining the path of a projectile body. Above all, this branch of the mathematics derives its chief importance from the applications that are made of it in modern aſtronomy.

The uſes of the conic ſections in phyſical ſcience have, as it is natural to conjecture, led modern mathematicians to conſider theſe curves under particular points of view ſuited to their purpoſes. It is for this reaſon that the properties of thoſe remarkable points, called foci, have been inveſtigated with ſo much care in latter times. In optics, theſe points are almoſt excluſively the ſubjects of conſideration when the conic ſections are concerned; and, in aſtronomy, the ſun invariably occupies one of the foci of the elliptical orbits which the planets and comets deſcribe round him. Theſe points did not entirely eſcape the penetration of the ancient geometricians. Apollonius has anticipated the moderns here, as well as in other parts of this ſcience. He has unfolded many of the moſt curious properties of the foci, in the ellipſe and hyperbola. He treats of them under the appellation of "Puncta ex applicatione facta;" which ſignifies that they are points formed by cutting the tranſverſe axis in the ellipſe, and the tranſverſe axis produced in the hyperbola, into two ſegments containing a rectangle equal to the ſquare of half the leſs axis; and the phraſe is thus equivalent to the modern definitions of the ſame points. The focus of the parabola is not noticed by Apollonius, nor by any other ancient author; unleſs, indeed (as has been pointed out to the writer of this article by a friend,) we except a propoſition (Theor. 222, Prop. 238.) in the ſeventh book of the "Collectiones Mathematicæ," where Pappus delivers, in the form of a Locus, that beautiful property of the focus, and the correſponding directrix of any conic ſection, which ſome modern writers, conſidering it as characteriſtical, have made the baſis of a definition of the curves in plano. Mydorgius, contemporary with Des Cartes, is the firſt who treated generally of the foci, of all the conic ſections. Since his time the properties of theſe points have been gradually and fully developed.

Before Dr. Wallis, all the writers on conic ſections followed the ancient geometricians in making the cone the common origin and foundation of their theories. That mathematician firſt entertained the idea of uſing the cone as little as poſſible in delivering the elements of the conic geometry; and this plan is purſued in his treatiſe, publiſhed at Oxford in 1655. In ſupport of this innovation, Dr. Wallis urges the prolixity of Apollonius's work, and the difficulty and perplexed nature of the demonſtrations. On the old plan, many propoſitions reſpecting the generating of the cone, and the properties of that ſolid, are to be previouſly gone through; and the diagrams are rendered confuſed by many lines drawn in different planes. On theſe accounts, he aſſerts, that the ſtudy of the conic ſections was generally neglected: "unde et nimis neglecta fuit (conicorum doctrina), tanquam inſuperabilis difficultatis plena." It muſt be allowed that the objections of Dr. Wallis are not without foundation. On the other hand, it has been the opinion of ſome later mathematicians, that the defects of the treatiſe of Apollonius ariſe, not from his having made too much uſe of the cone, but from his having availed himſelf too little of the aſſiſtance to be derived from that ſolid. They contend that the moſt general and characteriſtical properties are firſt to be ſought for in the cone itſelf; whence they are to be transferred to its ſections, as particular caſes of more general propoſitions. The lateſt, and moſt approved writers, who have adopted this opinion, are Dr. Hamilton and profeſſor Robertſon of Oxford. Although Dr. Wallis propoſed to introduce the cone as little as poſſible in delivering the elements of the conic geometry; yet it is to be remarked that he ſtill imitated his predeceſſors in deriving, from that ſolid, the fundamental property which he afterwards made the baſis of all his reaſonings. But the idea, which he introduced, was ſoon carried farther; and treatiſes on the conic ſections were written, in which the cone was entirely laid aſide, and the curves were defined from deſcriptions in plano. De la Hire, in his "Nouveaux Elemens des Sections Coniques," publiſhed at Paris in 1679, is the firſt author who ſucceſsfully treated on the conic ſections in this new view of the ſubject. He derives the deſcription of the parabola from the equality that ſubſiſts between two lines meeting in any point of the curve, one of which is drawn to the focus, and the other is perpendicular to the directrix; and he deſcribes the ellipſe and hyperbola from the analogous properties, that, in the one, the ſum of two lines drawn from any point in the curve to the two foci, and, in the other, the difference of two ſuch lines, are equal to the tranſverſe axes. In theſe fundamental points De la Hire is followed by moſt of the later writers, who have treated of the conic ſections independently of the cone; and, in particular, by Dr. Simſon of Glaſgow, who has publiſhed an extenſive and accurate treatiſe on this ſubject. Beſides the method of De la Hire, another way of defining the curves in plano has been propoſed. It is founded on that general property of the directrix firſt given by Pappus Alexandrinus, as we have already noticed above. The learned abbé Boſcovich, an excellent Italian mathematician, has drawn his definitions of the curves from this fundamental property in the ingenious treatiſe on conic ſections, publiſhed in his "Elementa Matheſeos Univerſæ:" and we have two works in our own language, which are founded on the ſame primary definitions; that of Mr. Newton of Cambridge, and that of Mr. Walker of Nottingham.

The doctrine of the conic ſections is of great uſe in phyſical and geometrical aſtronomy, and the phyſico-mathematical ſciences. This doctrine has been much cultivated by geometers ancient and modern: and we have many good treatiſes on the ſubject; but that publiſhed by Mr. Simſon, profeſſor of mathematics at Glaſgow, deſerves to be particularly mentioned, not only for its elegance, but for its geometrical accuracy, which, as he juſtly remarks in his preface, has not always been ſo well obſerved in treatiſes of this kind, as it ought to be. See alſo Gregorii a St. Vincenti Opus de Quadratura Circuli, & Sectionum Coni; Mydorgius de Sectionibus Conicis: De la Hire de Sectionibus Conicis; Trevigar Elem. Section. Con.; Hamilton's Tract. Geom. de Section. Con.; De l'Hopital's Anal. Treat. of Conic Sections; Muller's Treatiſe, &c.; Hutton's; and Halley's edition of Apollonius, &c. Oxon. 1710. fol.

To the properties of the conic ſections, mentioned above, it may be proper to add the properties of their oſculatory circles, or circles of curvature. See CURVATURE.

CONIC *ſections, ſimilar*. See SIMILAR.

CONIC *Form of Mountains and Hills*. Too many naturaliſts have fallen into the miſtake, of denominating mountains or hills which have a conical top, to be of volcanic origin; becauſe, granite ſometimes, as Achterman mountain in the Hartz, aſſumes a conic form, Laſius 17; and porphyry frequently takes this ſhape. In ſome rare inſtances, the rupture of the ſtrata has produced conical hills. See ELEVATION *of Strata* and VOLCANO.

CONICA, in *Ancient Geography*, a town of Aſia, in Paphlagonia. Ptolemy.

CONICS, that part of the higher geometry, or geometry of curves, which conſiders the cone, and the ſeveral curve lines ariſing from the ſections thereof.

CONICTHYODONTES, or *Plectronitæ*, in *Natural Hiſtory*, one of the three names by which the foſſil teeth of fiſh are known; ſo called, from their ſuppoſed reſemblance to the ſpur of a fighting cock.

Though authors aſſure us that theſe are the teeth of a fiſh, the jaws having been found with theſe bodies in them; yet they do not pretend to know to what fiſh they belong. They are generally of an oblong conic figure, broad at the baſe, and narrow at the point, where they are uſually a little crooked: they are hollowed at the root, and are from the tenth of an inch to two inches long, commonly of a cheſnut colour, and are found in the ſtrata of clay, but moſt uſually in thoſe of ſtone; and are ſeen more frequently in England than in any other part of the world. Hill's Foſſils, p. 645.

CONJECTURE, in the *Philoſophy of the Mind*, expreſſes a degree of belief founded upon ſlight evidence. In ſome caſes, a diſpoſition to conjecture, indiſcreetly indulged, may be productive of many extravagancies. It may prompt us to build favourite hypotheſes on very weak foundations, and to aſcribe the conduct of others to wrong motives, according to our prejudices for or againſt them. When indulged with diſcretion, a conjecture affords ſome relief to the mind from the inquietude of ignorance and uncertainty. It provides a temporary ſubſtitute for knowledge; and it frequently ſuggeſts ideas which lead to the diſcovery of truth.

Conjectural criticiſm, and conſequent emendations of ancient authors, claſſical and ſcriptural, ſhould be exerciſed with great caution; otherwiſe, the imagination will be apt to miſlead perſons moſt eminent for their genius and learning.

It is one of the moſt important, and at the ſame time one of the moſt diſputed points in ſound criticiſm, ſays Michaelis, whether what is called "conjectura critica," may be applied to the New Teſtament; or, in other words, whether in certain caſes, and under certain reſtriction, provided we uſe all due care and caution, we may reject the readings of all the MSS., verſions, and fathers, and merely on a probable ſuppoſition, admit a reading that is ſupported by no written authority; and whether, if we proceed on theſe principles, we have any reaſon to expect, that we ſhall ever arrive at the truth. Many learned men, deſervedly eſteemed critics, are of opinion, that conjectures are as allowable at preſent in the New Teſtament, as in the claſſic authors. Nevertheleſs, the majority of divines formerly conſidered them as preſumptuous, if not impious; but thoſe perſons who are ſo ſtrenuouſly attached to the printed text, are not aware, as Wetſtein obſerves, in his Prolegomena, that a very great number of readings, which they ſo zealouſly ſupport, are merely critical conjectures, advanced either by the ancient fathers, or by the modern editors of the Greek Teſtament, in the 16th and 17th centuries. Theſe readings muſt therefore be immediately rejected, if critical conjecture is wholly inadmiſſible. As this queſtion is purely critical, it ſhould be argued, not on theological, but on critical grounds. The argument which is drawn from the hypotheſis, that Divine Providence would not permit the true reading in any text of the New Teſtament to be loſt, ſeems to be very extraordinary, when it is urged by perſons who tacitly acknowledge that the ſame providence has not guarded againſt the neceſſity of conjecture in the Old Teſtament. Beſides, no man can aſſert, that, becauſe the true reading of any paſſage is no longer to be found, it is therefore totally loſt, ſince the number of MSS. of the Greek Teſtament (together with other original documents) which have been actually collated, are trifling in compariſon with the whole number that have been written; and a reading, which is now ſupported only by probable conjecture, may, in proceſs of time, be confirmed by good authority. Moreover, it by no means diminiſhes the certainty of our faith, that ſome few paſſages of the New Teſtament have certain internal marks, which diſcover them to be not genuine, and which render it neceſſary to reſtore the true reading by critical conjecture. Our faith would only be in danger, if the number of theſe paſſages was ſo very great, as to render the whole New Teſtament ſuſpicious; or, if the principal and diſtinguiſhing doctrines of Chriſtianity muſt be either added to, or taken from, the ſacred text, on no other authority than that of mere conjecture. But if, without aſſuming to ourſelves the power of altering articles of religion, and confining our emendations to mere matters of criticiſm, we alter ſome words or ſentences, the grounds of our faith are by no means affected, nor need we apprehend any evil conſequences. In ancient writings, of which only one copy is extant, critical conjecture is indiſpenſable. The neceſſity remains the ſame, even where there are ſeveral MSS. if thoſe MSS. are only copies of one and the ſame more ancient MS. If we have more than a ſingle copy of any work, and thoſe copies are tranſcripts of different and diſtinct MSS., the neceſſity of critical conjecture decreaſes in proportion to the number of copies; but it does not entirely vaniſh, unleſs the number of the MSS. is very conſiderable. We have, therefore, no reaſon for cenſuring the critics of the 16th century, if, in their editions of the Greek Teſtament, they have ſometimes, departed from the reading of their MSS., and ſubſtituted ſuch as were agreeable to probable conjecture. The probability, however, that critical conjecture alone can reſtore the true reading, decreaſes in the ſame proportion, as our materials of criticiſm, or collections of various readings increaſe. And ſince ſo many MSS., works of the fathers, and ancient verſions made in diſtant countries, and in different periods, have been carefully collated; and ſince alſo thoſe very ancient Latin verſions that vary ſo conſiderably from each other, and were tranſlated from very different Greek MSS. have been made known to the public, we might even doubt whether critical conjecture ought not at preſent to be entirely rejected. It has, however, its learned and zealous advocates. It deſerves to be conſidered, in reply to the plauſible objection above ſuggeſted, that we have not a ſingle MS. now extant, that was written in the four firſt centuries, and that the ancient verſions have not deſcended to us without alterations. It is likewiſe evident, from the writings of the fathers, that many readings were in thoſe times in the Greek MSS., which are not now found in any, or only in a very few; having been altered either by accident, or becauſe they appeared to the tranſcribers to be obſcure, or exceptionable.

ceptionable. It is therefore not impoſſible, that other readings, which have not been preſerved in the works of the fathers, or in the Greek MSS., may have been equally loſt; and among them, perhaps, ſome that were genuine. Beſides, it is not impoſſible that there are many important MSS. of which we have no knowledge; and that a collation of thoſe MSS. might confirm the critical conjectures of the 18th century, in the ſame manner as many conjectures of the 16th century have been confirmed in the 18th, by the authority of MSS., and ancient verſions. It might further be added, and it deſerves conſideration, that all our MSS., and verſions of the New Teſtament, were probably taken, not from the ſingle copies of the Goſpels and Epiſtles, which proceeded from the hands of the Apoſtles themſelves, but from the collection that was formed of the ſeveral parts of the New Teſtament. If, inſtead of 292 MSS. enumerated by Michaelis, we had above 1000, they would ſtill be tranſcripts of one and the ſame copy; and if this copy had any errors, which it would be the higheſt preſumption to deny, theſe errors muſt have been tranſmitted into every MS. of the Greek Teſtament, whatſoever; and theſe errors can be remedied only by the aid of critical conjecture. Upon the whole, it appears, that a collection of critical conjectures may be of great uſe in eſtabliſhing the genuine text of the Greek Teſtament; and it is likewiſe attended with this particular advantage, that we are led by it to examine MSS., and other original documents, with greater accuracy, in order to ſee whether thoſe readings, which had no other ſupport than conjecture, may not be eſtabliſhed by written authority. Such a collection has been publiſhed by Bowyer, a learned bookſeller in London, the third edition of which, with improvements, was publiſhed in London in 1782. Of ſeveral hundred conjectures, which Bowyer has produced, there is hardly one, ſays Michaelis, which, after impartial examination, will be found probable. On the other hand, it cannot be denied, that there are ſome few, which bear on them the marks of probability. Several of theſe are examined by Michaelis, and he has added a variety of his own conjectures, for which we muſt refer to his work, cited at the cloſe of this article. Beſides the critical conjectures already mentioned, there is another kind of conjecture, denominated by Michaelis "theological conjecture," which conſiſts in altering the text of the ſacred writings, according to the maxims adopted by any particular party, whether it be the ruling, or the perſecuted party, in the church. Although it is allowable to venture a conjecture in matters relating to hiſtory, to dates, or to names, as in theſe caſes the Bible is not our only "principium cognoſcendi," yet whoever alters the text in ſubjects which relate to points of divinity, evidently preſuppoſes a "principium cognoſcendi," that is prior to the Bible itſelf; and this is frequently nothing more than a ſet of principles, which this or that particular perſon has thought proper to adopt. It has been urged by thoſe who defend theological conjecture, that we ought never to loſe ſight of the "analogia fidei," or analogy of faith. Thus, if two paſſages in the Bible contradict each other in matters of faith, the one muſt be altered. But the queſtion recurs, how ſhall we determine which of the two is to be altered? "In my opinion," ſays Michaelis, "we ſhould alter neither, but reject the whole, as not coming from the Deity, if it be true that there are real contradictions, for it is upon this ground, that we condemn the Koran." But every apparent contradiction is not a contradiction in reality; and paſſages that are ſeemingly at variance may, with ſkill and patience, be reconciled. Such is the caſe with reſpect to Rom. iii. 28. and James, ii. 24. the whole contradiction vaniſhing, as ſoon as we reflect that St. Paul underſtands faith in Chriſt, St. James faith in the unity of the Godhead. For other obſervations on this ſubject, we refer to the author. Michaelis's Introduction to the New Teſtament by Marſh, vol. ii. part. 1. See CRITICISM.

CONIFERÆ, in *Botany*, the fifteenth natural order in the Philoſophia Botanica of Linnæus, and the fifty-firſt of the Prælections. In the Philoſophia Botanica the genera included in it are abies, pinus, cupreſſus, thuja, juniperus, taxus, ephedra. Theſe are all retained in the Prælections, pinus and abies being united, and equiſetum added with a mark of doubt, and an obſervation that it has the pollen of filix. The order derives its name from the cones or ſtrobiles in which the ſeeds are contained. The fruit of juniperus, indeed, ſeems to be a berry, but it is properly a ſtrobile, with pulpy ſcales, which do not open; for it has ſix fleſhy connate ſcales, each containing a ſingle ſeed. Taxus alſo apparently bears a berry; but this falſe berry is only the fleſhy receptacle almoſt covering the ſeed. All the coniferæ yield a reſin, which renders moſt of them evergreen. The fruit in all is biennial, produced in the ſpring, but not ripening and dropping its ſeeds until the ſpring after.

The coniferæ compoſe alſo one of the natural orders of Juſſieu, the fifth of his fifteenth claſs, with the following character: *Flowers* monoicous or dioicous. *Males* moſt frequently in a catkin, or heaped together upon a catkin, each furniſhed with a ſcale, with or without a calyx: the ſtamens attached either to the calyx, or to the ſcale. *Stamens* definite or indefinite in number: filaments ſometimes diſtinct, ſometimes united into a ſimple or branched ſtipes. *Females* either ſolitary, or capitate, or diſpoſed in a ſtrobile or cone, denſely imbricated with ſcales that ſeparate the flowers; furniſhed either with a calyx or with a ſcale diſcharging the office of a calyx. *Germ* ſuperior, conical, either double or manifold, with as many ſtyles and ſtigmas, and either as many ſeeds, or as many one-ſeeded capſules. *Corculum* cylindrical, central, in a fleſhy periſperm, two-lobed; the lobes ſometimes, but rarely, divided or palmate, thence appearing many-lobed. *Stem* a tree or ſhrub. It contains the following genera: I. With a ſtaminiferous calyx; ephedra, caſuarina, taxus. II. With only a ſtaminiferous ſcale, the true coniferæ: Juniperus, cupreſſus, thuya, araucaria (Dom. beya: Lam.), pinus, abies.

Ventenat has the ſame diviſion and genera, except that he omits araucaria.

CONIGLIANO, in *Geography*, a ſmall, but populous, town, in the diſtrict of Treviſo, in the territory of Venice, which now forms part of the kingdom of Italy.

CONIL, a ſmall town of Spain, in the kingdom of Seville, in Andaluſia, on a bay to which it gives name; 15 miles S.S.E. from Cadiz, with a ſtrong caſtle. Its inhabitants ſubſiſt chiefly by fiſhing. N. lat. 36° 16.′ W. long. 6° 8′.

CONIMBRIGA, or CONIMBRICA, in *Ancient Geography*, *Coimbre*, a town of Spain, in Luſitania, on the Munda.

CONIN, or KONIN, in *Geography*, a town of Poland, in the palatinate of Kaliſch; 18 miles S.S.E. of Gneſen.

CONJOINED, or CONJUNCT, in *Heraldry*, a term uſed for charges in arms when linked together.

CONJOINT, or CONJUNCT, is applied in *Ancient Muſic*, in the ſame ſenſe as *conſonant*, to two or more ſounds heard at the ſame time. See CONSONANCE.

CONJOINT *degrees*, two notes which immediately follow each other in the order of the ſcale; as *ut* and *re*.

CONJOINT *tetrachords*, are two tetrachords, where the ſame *chord* is the higheſt of the one, and the loweſt of the other.

CONIQUE, *Fr.* This term is applied to a piece of artillery, of which the bore is wider towards the muzzle than it is towards the breech.

CONIRA, in *Botany*, a name uſed by ſome authors for the *myrrhis*. Ger. Emac. Ind 2.

CONISALUS, in *Mythology*, a god of the Athenians mentioned by Strabo, and ſuppoſed to be the ſame with Priapus.

CONISBERG, in *Geography*. See KONGSBERG.

CONISCI, in *Ancient Geography*, a people of Spain, who formed a part of the Cantabri, and in their dreſs reſembled the Gauls, according to Strabo.

CONISIUM, a town of Aſia, in Myſia, according to Pliny. Hierocles calls it *Cinioſine*, and makes it an epiſcopal city in the province of the Helleſpont.

CONISOR. See GOGNISOR.

CONISSALÆ, in *Natural Hiſtory*, the name of a claſs of foſſil bodies; the word is derived from κονισσαλος, *powder;* all the ſpecies of bodies of this claſs being found like common ſand; in form of powder, have been uſually confounded together, under the common name of *ſands*. The coniſſalæ are defined to be ſtones of a differently debaſed, cryſtalline, or ſparry matter, but always found in form of ſmall and diſunited particles, great numbers of which, being amaſſed together, form a kind of powder.

Of this claſs of bodies there are two diſtinct and large genera. 1. The ſands properly ſo called, which are compoſed of particles all appearing to have a tendency to the ſame regular figures, tranſparent, vitrifiable by a ſtrong fire, and not ſoluble in, or effervefcing with acids. 2. The *ſaburræ*, or *grit*, of ſtone found looſe; theſe are found in form of powder, the particles of which, in general, have no tendency to any particular figure, but appear to be rudely broken fragments of larger maſſes. Hill's Hiſt. of Foſſ. p. 543.

CONISTERIUM, a room in the ancient Gymnaſia or Paleſtræ, in which was kept the ſand for the uſe of the wreſtlers, who were accuſtomed, after anointing their bodies with oil, to ſprinkle themſelves with ſand to afford a firmer graſp in their encounters.

CONISTON, in *Geography*, a village in the northern part of Lancaſhire, in the hundred of Loynſdale. Latitude about 54° 29′, and longitude 2° 44′. W. It is ſituate on the ſteep aſcent of a mountain of blue argillaceous ſchiſtus, near the northern end of a romantic lake, of ſix miles in length, and one in breadth, called after its name; near this town ſome copper-mines are worked, but to no conſiderable extent, and ſome veins of lead-ore: ſlate quarries are alſo to be found near this place. There is a torrent or mountain ſtream of water which precipitates itſelf into the lake near this place.

CONISTORSIS, in *Ancient Geography*, a town of Spain in Celtiberia. Strabo mentions it as a very famous town.

CONITZ, or CHOINITZ, in *Geography*, a town of Pruſſia, in Pomerelia; 40 miles S. of Dantzick.

CONJUGAL RIGHTS, in *Law*. The ſuit for "reſtitution of conjugal rights" is one ſpecies of matrimonial cauſes; which is brought whenever the huſband or wife is guilty of "ſubtraction," or lives ſeparate from the other without any ſufficient reaſon: in which caſe the eccleſiaſtical juriſdiction will compel them to come together again, if either party be weak enough to deſire it, contrary to the inclination of the other.

CONJUGATE *Axis*, &c. in *Conics*. See CONIC *Sections*.

CONJUGATE *Point*, in *Geometry*. See POINT.

CONJUGATES, in *Rhetoric*, denote words deduced from the ſame origin with that of the ſubject: *e. g. He who does juſtly, is juſt.*

CONJUGATION, in *Anatomy*, a term applied by the older anatomiſts to the nerves coming from the brain, in the ſame ſenſe that we employ the expreſſion, pair of nerves.

CONJUGATION, in *Grammar*, an orderly diſtribution of the ſeveral parts or inflexions of verbs, in their different moods and tenſes, to diſtinguiſh them from each other: or, the manner in which the perſonal terminations of verbs are changed to expreſs the ſeveral moods and tenſes.

The Latins have four conjugations diſtinguiſhed by the terminations of the infinitive, *are, ēre, ĕre, ire;* and moſt of the French grammarians reduce the conjugations of their language to the ſame number, ending in *er, re, ir*, and *oir*. Some have added a fifth Latin conjugation called the *mixt*, becauſe it is compoſed of the third and fourth, as *capio, accipio*.

The Greeks have three kinds of verbs; the firſt called *barytons*, becauſe the laſt ſyllable is pronounced with a grave accent; (ſee BARYTONUM); ſuch are τεινω, *tendo*, and τυπτω, *verbero:* the ſecond are circumflex verbs, which admit a contraction in their termination, and are then marked with a circumflex accent; ſuch is αγαπαω, αγαπω, *amo:* the third kind comprehends the verbs in μι, as ειμι, *ſum*. Of the firſt ſort there are ſix conjugations; divided according to their characteriſtic, *i. e.* the letter preceding the termination. Accordingly verbs having the labials π, β, φ, or πτ, form the firſt conjugation of barytons; thoſe having the gutturals κ, γ, χ, or κτ, the ſecond; thoſe having the dentals τ, δ, θ form the third; verbs in ζω, σσω, or ττω, comprehend the fourth conjugation; the liquids λ, μ, ν, ρ, mark the fifth; while thoſe in ω pure, ſuch as τιω, λυω, diſtinguiſh the ſixth conjugation. Of the ſecond there are three, *viz.* thoſe in αω, εω, οω: but all theſe and the barytonous verbs are conjugated, that is, are varied in the ſame way to expreſs mood, time, number, and perſon. Of the third, there are four. But Meſſrs. de Port Royal reduce theſe 13 conjugations to two: *viz.* one in ω, comprehending the barytons and circumflex verbs; and the other thoſe in μι.

Mr. I. Jones, in his "Grammar of the Greek Tongue, on a new and improved Plan," has judiciouſly rejected the fore-mentioned diſtinctions as unneceſſary, becauſe they are uſeleſs and unmeaning; and diſtributed the Greek conjugations into four; *viz.* the active ω, its paſſive ομαι, the active μι, and its paſſive μαι.

In the Hebrew language there are four conjugations, *viz.* *kal* with its paſſive *niphal, pihel* with its paſſive *pyhal*, to which alſo may be referred *pohel, hiphil* with its paſſive *hophal*, and *hithpahel*. The third perſon ſingular maſculine of the firſt conjugation is the preterite of the theme; the ſecond conjugation has a *dageſh forte* in the ſecond radical; the third has the prefix letter ה; and the fourth, the ſyllable הת.

In Engliſh, where the verbs have ſcarce any natural inflexions, but derive all their variations from additional particles, pronouns, &c. we have hardly any ſuch thing as ſtrict conjugations.

Some grammarians, however, diſtribute Engliſh verbs into three conjugations, or claſſes, diſtinguiſhed from one another by a peculiar formation in ſome principal part belonging to each: and they obſerve that the three different terminations of the participles, *viz. ed*, or its contraction *t*, *ght*, and *en*, may be conſidered as the characteriſtics of the conjugations. But as the verbs of the firſt conjugation would ſo greatly exceed in number thoſe of both the others; and as thoſe of the third conjugation are ſo various in their form, and incapable of being reduced to one plain rule; it ſeems better in practice, as biſhop Lowth juſtly obſerves, to conſider the firſt in *ed* as the only regular form, and the others as deviations from it: after the example of the Saxon and German grammarians. Lowth's Introd. to Engliſh Grammar, p. 104, 1772. Murray's Eng. Gram. p. 96. ed. 8. Others again diſtinguiſh them by the different inflexion of the firſt tenſe in each root, and thus make four conjugations in the active voice: the firſt has three radicals alike: as *I do read; I read; i. e.* yeſterday; *I have read, i. e.* juſt now. The ſecond has the firſt and third radical alike; as *I run, I ran, I have run.* The third conjugation has the ſecond and third radical alike; as *I eſteem, I eſteemed, I have eſteemed.* The fourth has the three radicals different; as *I write, I wrote, I have written* or *writ.* The paſſive voice, being made up of the third radical and the auxiliary verb *am*, admits of no difference of conjugations. Ward's Eſſays on the Engliſh Language, p. 87.

CONIUM, in *Botany*, (κωνειον; Theophraſt. Dioſc. derived by Henry Stephens from κωνος, the cone of the mathematicians, a name given alſo, on account of its form, to that well-known children's toy, a top. From this latter ſenſe came the verb κωναω, which Heſychius explains by περιδινῶ implying a capacity to produce a whirling motion; and thence the poiſonous herb employed by the Greeks as the means of inflicting a capital puniſhment, was called κωνειον, becauſe it occaſioned a ſenſation of giddineſs in the ſufferer. Linnæus unaccountably derives the word from κονια, *duſt*). Linn. Gen. 336. Schreb. 469. Willd. 53. (Cicuta. Tourn. 160. Hall. 766. Gært. 117. Lam. Ill. 503. Juſſ. 223. Vent. 3. 28. Ciguë. Lam. Enc.) Claſs and order, *pentandria digynia.* Nat. Ord. *Umbellatæ*; Linn. *Umbelliferæ*; Juſſ. Vent.

Gen. Ch. *Umbel* partial, and univerſal with many ſpreading rays. *Involucre univerſal*, three or many-leaved, ſhort, unequal, membranous towards the baſe: *partial* with about three leaves, only half encloſing the pedicels. *Cal.* ſcarcely perceptible. *Cor.* Petals five, inflexed, heart-ſhaped, unequal. *Stam.* Filaments five, about the length of the petals; anthers roundiſh. *Piſt.* Germ inferior; ſtyles two, ſhort, reflexed; ſtigmas obtuſe. *Peric.* none. *Fruit* nearly globular, with five crenulate ridges; compoſed of two *ſeeds*, which are convex, almoſt hemiſpherical, ſtriated on one ſide, flat on the other, ſeparating as they become ripe.

Eſſ. Ch. Partial involucre only on one ſide, about three-leaved. Fruit nearly globular, with fine crenulate ridges.

Sp. 1. C. *maculatum.* Common hemlock. Linn. Sp. Pl. 1. Mart. 1. Willd. 1. Jacq. Auſt. 2. tab. 156. Curt. Flor. Lond. 1. tab. 17. Eng. Bot. 1191. Woodv. Med. Bot. tab. 22. (Cicuta major; Lam. Ill. tab. 195. fig. 1. Bauh. Pin. 160. Rai. Syn. Cicuta domeſtica. Moriſ. Umb. 18 *c. b.* § 9. tab. 6. fig. 1. Coriandrum. Roth Cranz.) "Seeds ſtriated." Linn. "Stem ſpotted at the baſe; furrows of the ſeeds crenate." Lam. "Seeds without prickles; ſtem much branched, ſhining, ſtriated." Dr. Smith. *Root* biennial, ſpindle-ſhaped, often branched, white, fleſhy. *Stem* three or four feet high, erect, cylindrical, hollow, furrowed, ſmooth, ſhining, marked with purple ſpots, much branched, eſpecially towards the top, leafy. *Leaves* ſupra-decompound, or ſeveral times pinnated; bottom ones very large, ſometimes two feet long; leaflets oblong, acutely notched, dark green above, paler underneath. *Rays* of the *umbel* from ten to twelve; of the umbellule fifteen or ſixteen. General involucre commonly many-leaved, deflexed. *Petals* white, heart-ſhaped, inflexed, nearly equal. The whole plant is narcotic, with a diſagreeable ſmell and nauſeous taſte. Very different opinions have been entertained with reſpect to its active qualities, but it may be doubted whether authors have always intended the ſame plant. Haller was inclined to think, that the plant which was fatal to Socrates and Phocion, was not that now before us, but the cicuta viroſa of Linnæus, which the French writers have called cicutaria. La Marck, on the other hand, aſſerts that the conium maculatum of Linnæus, his cicuta magna, is the cicuta of ancient authors, the very plant by which Socrates was poiſoned; and ſeverely cenſures Linnæus for changing its name to conium. But if this great botaniſt had looked into the Greek authors, he would have found that Linnæus only reſtored the moſt ancient name, and that the word cicuta is entirely of Latin origin, unknown to the Greek language. Whether Linnæus would not have done better, if he had retained the term cicuta, which had been adopted by all the modern botaniſts before him, is a queſtion to which an affirmative anſwer may perhaps be given. His cicuta viroſa might then, in concurrence with Haller's opinion, have been called conium. But when the change was made and had, through the extenſive circulation of the works of Linnæus, obtained general currency, a revival of the ancient name, inſtead of removing, has, in fact, increaſed the confuſion. Whatever may have been the plant by which Socrates was judicially murdered, our conium maculatum unqueſtionably poſſeſſes deleterious qualities; but, as Dr. Smith obſerves, it is happily too nauſeous to be incautiouſly ſwallowed in any dangerous quantity. See CICUTA in the Materia Medica, where it ſhould have been obſerved that Plato does not call the plant, by which Socrates periſhed, cicuta, a word which he had never heard; nor does he give it any Greek name peculiar to it; but conſtantly uſes the very general term φαρμακον, which denotes a ſtrong potion either poiſonous or medicinal. 2. C. *rugoſum.* Willd. 2. Thunb. prod. 50. (C. ſuffruticoſum; Berg. cap. 77.) "Seeds wrinkled." *Stem* ſomewhat ſhrubby. A native of the Cape of Good Hope. 3. C. *rigens.* Linn. Mant. 56. Mart. 2. Lam. 2. Willd. 3. Thunb. prod. 50. "Seeds ſomewhat muricated; peduncles furrowed; leaflets channelled, obtuſe." *Root* perennial. *Stem* purpliſh, rigid, ſtriated, erect, diffuſe, branched. *Leaves* twice-winged, ſomewhat fleſhy, doubled, obtuſe, crenulate, hard, the colour of rue; petioles longitudinally channelled. *Florets* all fertile, white; leaflets of the general involucre five, ſhorter than the rays of the umbel; one or two divided; thoſe of the little umbels ſeven; a few of them crenate; petals equal, lanceolate, rolled inwards. *Seeds* reddiſh, ſtriated and ſomewhat muricated. A native of the Cape of Good Hope, on the coaſt, introduced into England in 1787, by Maſſon. 4. C. *africanum.* Linn. Sp. Pl. 2. Mart. 3. Willd. 4. Jacq. hort. tab. 194. (Cicuta africana; Lam. 3. Ill. tab. 195. fig. 2. Caucalis africana; Boerh. Lugd. b. 1. tab. 63. Capnophyllum; Gært. 2. tab. 85. fig. 6.) "Seeds prickly." Linn. "Seeds muricated; petioles and peduncles even-ſurfaced." Willd. "Leaves twice winged, glaucous; petioles and peduncles even-ſurfaced; ſeeds tooth-muricated." Lam. *Root* annual, *Stems* three or four inches long, herbaceous, cylindrical, ſmooth, glaucous; with a few leaves, and one or two ſhort axillary branches. *Root-leaves* almoſt as long as the ſtem; leaflets flat, not channelled, ſmall, gaſhed. *Flowers* white, almoſt regular, in ſmall terminal umbels; leaflets of the general involucre from three to five, membranous towards the baſe; ſeveral of the florets barren. *Fruit* in the centre, ſeſſile. Linn. *Fruit* elliptical, lenticularly compreſſed, ſolitary in the centre of the partial umbels, nearly ſeſſile. *Seeds* ſlightly convex on one ſide, with three, ſometimes only two, tubercled or tooth-muricated ribs; flat or a little concave on the other; marked with a longitudinal middle line, and two curved, nearly obſolete, lateral ones. Gært. A native of the Cape of Good Hope; cultivated in 1759 by Miller, who received the ſeeds from Boerhaave. 5. C. *tenuifolium.* Mart. 5. Vahl. Symb. 3. 49. "Root and ſtem-leaves ſimple, linear." *Stem* a foot high, herbaceous, upright, ſcarcely branched, ſlender, cylindrical, ſmooth, ſlightly ſtriated. *Leaves* very narrow, a little broader at the baſe, ſomewhat ſheathing, very ſmooth; lower ones about four inches long. *Peduncles* lateral and terminal, few, remote. *General involucre* five-leaved; leaflets awl-ſhaped, ſomewhat rigid, ſhorter than the umbel; *partial* ones the length of the little umbels. *General umbel* ſmall, five-rayed; partial ones eight or ten-flowered. *Seeds* oblong, ſtriated, ſmall, ſmooth. A native of the Cape of Good Hope.

Conium *Royeni.* Linn. See Caucalis *arvenſis.*

Conium *dichotomum.* Desfont. See Tordylium *peregrinum.*

Conium, in *Ancient Geography*, a town of Aſia Minor, in Pacatian Phrygia. It appears to have been founded by Cineas, king of Theſſaly; and according to the notitia of Hierocles, it had been epiſcopal.

CONJUNCT. See Conjoint Pair.

Conjunct *of an arch.* See Supplement.

Conjunct *ſentence.* See Sentence.

CONJUNCTION, in *Aſtronomy*, the meeting of the ſtars or planets, in the ſame point or place of the heavens, and it is either *true* or *apparent.*

If the two bodies meet both in the ſame degree of longitude and latitude, a right line drawn from the centre of the earth through the centre of one of them, paſſes through that of the other; then the conjunction is ſaid to be true and central: and if the lower hides the upper, the conjunction is ſaid to be corporal.

If the line paſs wide of the centre of the earth, the conjunction is ſaid to be partile.

If the bodies do not meet preciſely in the ſame degree, but are joined with ſome latitude, the conjunction is ſaid to be apparent. Thus, when a right line, ſuppoſed to be drawn through the centres of two planets, does not paſs through the centre of the earth, but through the eye of the ſpectator; it is ſaid to be an apparent conjunction.

Some have alſo divided conjunctions into *great* and *greateſt:* the former denoting thoſe which occur at comparatively a ſhorter interval, ſuch as the conjunctions of Jupiter and Saturn, and the latter happening after a longer interval, ſuch as thoſe of the three ſuperior planets, Mars, Jupiter, and Saturn. But this diviſion has little place in aſtronomy; being founded on the notion of the particular influences, &c. of the heavenly bodies in ſuch and ſuch aſpects.

Aſtrologers maintain, that the deluge was owing to a conjunction of all the planets in Capricorn; and that the conflagration will be occaſioned by their conjunction in Cancer: whence they pretend to foretel the end of the world.

The conjunction is the firſt, or the principal, of all the aſpects; and that whence the other aſpects commence; as oppoſition is the laſt, where they terminate. See Character.

The moon is in conjunction with the ſun every month. Her conjunctions and oppoſitions are called by a general name, *ſyzygies.*

Eclipſes of the ſun never happen, but when there is a conjunction of the ſun and moon in or near the nodes of the ecliptic.

Conjunction, in *Grammar*, a particle which expreſſes a relation or dependance between words and phraſes; thus called, becauſe it ſerves to join or connect the parts or members of a diſcourſe, which is its common uſe, and alſo to connect words; ſo as to ſhew the relations which thoſe words ſo united have to other parts of the ſentence.

Conjunctions, however, often unite ſentences, when they appear to unite only words: *e.g.* "Duty and intereſt forbid vicious indulgences;" which form of expreſſion contains in reality two ſentences. See Murray's Eng. Gram. p. 105. ed. 8.

Mr. Harris defines a conjunction to be a part of ſpeech, void of ſignification itſelf, but ſo formed as to help ſignification, by making two or more ſignificant ſentences to be one ſignificant ſentence; and he diſtributes them into ſuch as connect ſentences and their meaning, and ſuch as conjoin the ſentences whilſt they disjoin the ſenſe. The former are *conjunctive*, and are either copulative or continuative, the former joining all ſentences, however incongruous in ſignification, and the latter joining only thoſe which have a natural connection; and the latter *disjunctive*, ſome of which are ſimple, as, *either* it is day *or* it is night, and adverſative, as, it is not day *but* it is night. Hermes, p. 240, &c. See Adversative and Continuative.

Mr. Horne Tooke, in his "Diverſions of Purley," has made ſome remarks, in his uſual manner, on the definition of a conjunction given by Mr. Harris, charging the author not only with ſelf-contradiction, but with great want of perſpicuity. Accordingly he thus ſtates Mr. Harris's definition: "A ſound ſignificant devoid of ſignification, (referring to Mr. Harris's definition of a word), having at the ſame time a kind of *obſcure* ſignification; and yet having neither ſignification nor no ſignification; but a *middle ſomething* between ſignification and no ſignification, ſharing the attributes both of ſignification and no ſignification; and linking ſignification and no ſignification together." This acute and ingenious writer denies conjunctions to be a ſeparate ſort of words or parts of ſpeech by themſelves. For they have not a ſeparate *manner of ſignification*; although they are not *devoid* of ſignification. And the particular ſignification of each muſt be ſought for from amongſt the other parts of ſpeech, by the help of the particular etymology of each reſpective language. By ſuch means alone can we clear away the obſcurity and errors in which grammarians and philoſophers have been involved by the corruption of ſome common words, and the uſeful abbreviations of conſtruction. (See Abbreviation.) And, at the ſame time, we ſhall get rid of that farrago of uſeleſs diſtinctions into conjunctive, adjunctive, disjunctive, ſubdisjunctive, copulative, negative copulative, continuative, &c. &c. &c., which explain nothing; and (as moſt other technical terms are abuſed) ſerve only to throw a veil over the ignorance of thoſe who employ them. In diſmiſſing conjunctions from the rank which they have long held as diſtinct parts of ſpeech, Mr. Tooke cites ſeveral authorities; and among others, biſhop Wilkins, who, in his "Eſſay towards a real Character and a philoſophical Language," (part iii. c. 4. p. 312.), ſays, "According to the true philoſophy of ſpeech, I cannot conceive this kind of words" (ſpeaking of adverbs and conjunctions) "to be properly a diſtinct part of ſpeech, as they are commonly called. But until they can be diſtributed into their proper places, I have ſo far complied with the grammars of inſtituted languages as to place them here together." Mr. Locke, who was much indebted to Wilkins, expreſſes his diſſatisfaction with all the accounts of language which he had ſeen. Sanctius reſcued *quod* particularly from the number of theſe myſterious conjunctions, though he left *ut* amongſt them: and Servius, Scioppius, G. J. Voſſius, Perizonius, and others, have explained and diſplaced many other ſuppoſed adverbs and conjunctions. "In ſhort," ſays the author whom we are now citing, "there is not ſuch a thing as a conjunction in *any* language, which may not, by a ſkilful herald, be traced home to its own family and origin; without having recourſe to contradiction and myſtery with Mr. Harris; or, with Mr. Locke, cleaving open the head of man, to give it ſuch a birth as Minerva's from the brain of Jupiter."

The author's ſcheme is fully developed in the following table, and the ſeveral conjunctions which it exhibits: and he ſays that

If	Are the Imperatives	Ᵹıꝼ	of their reſpective Verbs.	Ᵹıꝼan	To Give.
An		Ān		Ānan	To Grant.
Unleſs		Onleꞅ		Onleꞅan	To Diſmiſs.
Eke		Eac		Eacan	To Add.
Yet		Ᵹeꞇ		Ᵹeꞇan	To Get.
Still		Sꞇell		Sꞇellan	To Put.
Elſe		Āleꞅ		Āleꞅan	To Diſmiſs.
Tho'		Ðaꝼ		Ðaꝼıan	To Allow.
or		or		or	
Though		Ðaꝼıᵹ		Ðaꝼıᵹan	
Bŭt		Boꞇ		Boꞇan	To Boot.
Būt		Be-uꞇan		Beon-uꞇan	To Be-out.
Without		Yýꞃð-nꞇau		Yýꞃðan-uꞇan	To Be-out.
And		Ān-að		Ānan-að	*Dare congeriem.*

Left is the paſt participle Leꞅeð of Leꞅan, To Diſmiſs.

Since	Sıððan Sẏne Sꞇanð-eꞃ Sıððe or Sın-eꞃ	is the participle of Seon. To See.

That is the article or pronoun Ðaꞇ.

For a farther and ample illuſtration and proof of the etymologies above given, and ſeveral others, we muſt refer to Tooke's ΕΠΕΑ ΠΤΕΡΟΕΝΤΑ, or Diverſions of Purley, part i. p. 136—287, ed. 2.

The conjunction, according to the long eſtabliſhed claſſification, is the ſixth of the eight vulgar parts of ſpeech. See Speech.

Conjunctions render the diſcourſe more ſmooth and fluent; and ſerve very good purpoſes in the argumentative and narrative ſtyle; but they muſt ever be omitted where a perſon ſpeaks with emotion, as only ſerving to weaken and enervate it. Boileau obſerves, that nothing gives more warmth and life to a diſcourſe than to drop the conjunctions or copulatives; a paſſion, adds he, embarraſſed with conjunctions and uſeleſs particles, loſes all the fire and vehemence it would require in its progreſs.

Conjunctions are of various kinds.

Conjunctions *copulative*, or *conjunctive*, are thoſe which expreſs a relation of union or compariſon between things; and ſerve to connect or continue a ſentence, as, *and, only, as much as, in the ſame manner as, neither more nor leſs, inaſmuch as, not only, but alſo.*

Conjunctions *adverſative*, thoſe which expreſs a reſtriction, or contrariety; as, *but, nevertheleſs, although, far from.* See Adversative.

Conjunctions *cauſal*, thoſe which ſhew that the reaſon of ſomething is alleged: as, *for, becauſe, ſeeing, the rather ſince, inaſmuch as.*

Conjunctions *concluſive*, thoſe which denote a conſequence drawn: as, *for which reaſon, but then, of conſequence, ſo that,* &c.

Conjunctions *conditional*, are thoſe which import a condition: as, *if, if not, on condition that, provided that, in caſe of.* See Conditional.

Conjunctions *continuative*, thoſe which expreſs a ſucceſſion, or continuation of the diſcourſe: as, *in effect, even, whatever it be.* See Continuative.

Conjunctions *disjunctive*, thoſe which expreſs a relation of ſeparation or diviſion, or which ſerve not only to connect and continue the ſentence, but alſo to expreſs oppoſition of meaning in different degrees: as, *neither, whether, or, though, yet, but,* &c.

Conjunctions *dubitative*, thoſe which expreſs ſome doubt, or ſuſpenſion of opinion: as, *if, that is to ſay,* &c.

Conjunctions *exceptive*, are, *if it be not, unleſs that,* &c.

CONJUNCTIVA Tunica, in *Anatomy*, is the membrane which connects the front of the eyeball to the poſterior ſurface of the eyelids. See Eye.

CONJURATI Fratres. See Fratres.

CONJURATIO, in *Antiquity*, denotes an oath; and *conjuratus* the ſame with *conjurator, viz.* one who is bound by the ſame oath. *Conjurare* is uſed when ſeveral perſons affirm a thing by oath. Mon. Ang. 7. 1. p. 207.

CONJURATION, in *Law*, ſignifies a plot or confederacy, made by perſons combining together by oath or promiſe, to do ſome public harm. But it was more particularly uſed, formerly, for having a perſonal conference with the devil, or ſome evil ſpirit, to know any ſecret, or to effect any purpoſe. Anno 5 Eliz. c. 16.

It is ſaid in ſome of our law books, that the difference between *conjuration* and *witchcraft* is, that the former endeavours by prayers and invocation of God's powerful name, to compel the devil to ſay or to do what the offender commands him; the latter deals rather by friendly and voluntary conference or agreement with the devil or familiar, to have the offender's deſires ſerved, in lieu of blood, or other gift offered to the devil, eſpecially of the offender's ſoul. And both theſe differ from *inchantment* or *ſorcery*; becauſe thoſe were ſuppoſed to be perſonal conferences with the devil, and theſe are but medicines and ceremonial forms of words (commonly called *charms*) without apparition. Cowel.

Hawkins, in his "Pleas of the Crown," (l. i. c. 3.) ſays, that *conjurors* are thoſe, who, by force of certain magic words, endeavour to raiſe the devil, and oblige him to execute their commands. *Witches* are ſuch who, by way of conference, bargain with an evil ſpirit, to do what they deſire of him: and *ſorcerers* are thoſe who, by the uſe of certain ſuperſtitious words, or by the means of images, &c. are ſaid to produce ſtrange effects, above the ordinary courſe of nature. All theſe were anciently puniſhed in the ſame manner as *heretics*, by the writ "de hæretico comburendo," after a ſentence in the eccleſiaſtical court; and they might be condemned to the pillory, &c. upon an indictment at common law. 3 Inſt. 44. H. P. C. 38. The preſident Monteſquieu alſo (Sp. Laws, b. xii. c. 5.) ranks ſorcery and hereſy together; laying it down, at the ſame time, as an important maxim, that we ought to be very circumſpect in the proſecution of magic and hereſy; becauſe the moſt unexceptionable conduct, the pureſt morals, and the conſtant practice of every duty in life, are not a ſufficient ſecurity againſt the ſuſpicion of crimes like theſe. See Witch-*craft*.

Our fore-fathers were ſtronger believers in the ridiculous ſtories that have been generally told concerning witchcraft and ſorcery than any who live in theſe more enlightened times, when they enacted by ſtat. 33 Hen. VIII. c. 8. all witchcraft and ſorcery to be felony without benefit of clergy; and again by ſtat. 1 Jac. I. c. 12. that all perſons invoking any evil ſpirit, or conſulting, covenanting with, entertaining, employing, feeding, or rewarding any evil ſpirit; or taking up dead bodies from their graves to be uſed in any witchcraft, ſorcery, charm, or inchantment; or killing or otherwiſe hurting any perſon by ſuch infernal acts; ſhould be guilty of felony without benefit of clergy, and ſuffer death. And if any perſon ſhould attempt by ſorcery to diſcover hidden treaſure, or to reſtore ſtolen goods, or to provoke unlawful love, or to hurt any man or beaſt, though the ſame were not effected, he or ſhe ſhould ſuffer impriſonment and pillory for the firſt offence, and death for the ſecond. Theſe acts continued in force till lately, to the terror of all ancient females in the kingdom; and many poor wretches were thus ſacrificed to the prejudice of their neighbours, and their own illuſions: not a few having, by ſome means or other, confeſſed the fact at the gallows. But though ſome of the tales that led to theſe penal ſtatutes ſtill exiſt among the uninformed vulgar, as the triumph of impoſture over credulity, and as bugbears to children, inexcuſably employed for this purpoſe; all executions for this dubious crime are now at an end:—our legiſlature having at length followed the wiſe example of Louis XIV. in France, who thought proper by an edict to reſtrain the tribunals of juſtice from receiving informations of witchcraft. (See Voltaire's Age of Lewis XIV. c. 29. Mod. Un. Hiſt. vol. xxv. p. 215.) Yet Voughlans (De Droit Criminel, 353. 459.) ſtill reckons up ſorcery and witchcraft among the crimes puniſhable in France. With us the above recited ſtatutes againſt conjuration and witchcraft are repealed; and no proſecution ſhall be carried on for the future againſt any perſon for conjuration, witchcraft, ſorcery, or inchantment: but where perſons pretend to exerciſe any kind of witchcraft or conjuration, &c. or undertake to tell fortunes, or, from their ſkill in any occult ſcience, to diſcover where goods ſtolen or loſt may be found; they ſhall upon conviction be impriſoned a year, and ſtand in the pillory once in every quarter, in ſome market-town, and may be ordered to give ſecurity for their good behaviour, by ſtat. 9 Geo. II. c. 5.

CONKAIR, in *Geography*, a town of Hindooſtan, in the province of Berar, ſituated between a high rocky hill and the ſouth bank of the Mahanuddee river, which riſes at a place called Sehowah, about 7 coſs S. of Conkair. The rajah of Conkair has built a fortreſs on the ſummit of the hill, and mounted it with two guns.

CONKERE, a poſt of Chineſe Tartary. N. lat. 44° 50'. E. long. 101° 49'.

CONLIE, a ſmall town of France, in the department of the Sarthe, and chief place of a canton, in the diſtrict of Le Mans, 12 miles N.W. from Le Mans. It has 1405 inhabitants. The canton reckons 16 communes, with 13,055 inhabitants upon a territorial extent of 220 kiliometres.

CONLIE'GE, a ſmall town of France, in the department of Jura, and chief place of a canton in the diſtrict of Lons le Saulnier, with 1201 inhabitants. The canton itſelf reckons 20 communes and 9089 inhabitants upon an extent of 142½ kiliometres.

CONLOBONGI, a town of the iſland of Borneo; 120 miles N. of *Banjer-Maſſing*.

CONN, in *Sea Language*. See Cond.

Conn, *Lough*, in *Geography*, a lake of the county of Mayo, Ireland, which is at the foot of mount Neptune, and extends 9 miles in length, but not more than two in breadth. There is a great number of iſlands in this lake, ſome of which are well planted, and being very fertile in fine graſs, ſerve for paſtures to ſheep and other cattle. That kind of trout called *Gillaroo*, is alſo found here in abundance. Dr. Shaw obſerves of theſe, that they do not appear to be ſpecifically different from the common trout, but by living much on ſhell-fiſh, and ſwallowing ſmall ſtones at the ſame time, their ſtomachs acquire a much greater degree of thickneſs, and a kind of muſcular appearance, ſo as to reſemble a ſort of gizzard. Lough Conn ſtretches from N.W. to S.E. between the Killalla and Caſtlebar.

CONNA, in *Botany*, Rheed. See Cassia *Fiſtula*.

Conna, in *Ancient Geography*, a town of Aſia Minor, in the Greater Phrygia. Ptolemy. The 6th council of Conſtantinople places it in Pamphylia.

CONNAC, denotes in Arabia, Paleſtine, Barbary, &c. the place, whether covered or not, where travellers or caravans halt or break off their journey for a time, in order to reſt and refreſh themſelves and their beaſts of burthen. Similar to this was the "malon," or inn (Gen. xlii. 27. xliii. 21, &c.) where the ſons of Jacob opened their ſacks to give their aſſes provender. The appellation Connac in the Eaſt correſponds with the πανδοχειον and καταλυμα in the Old or New Teſtament, which are rendered inns or hoſpitia. But excepting the caravanſaries which may in ſome meaſure anſwer to the πανδοχεια and καταλυματα, there are, properly ſpeaking, no houſes of entertainment in Barbary; at leaſt, in the ſenſe uſually applied to inns or hoſpitia, *i. e.* where travellers can be provided with lodgings, proviſions, and other neceſſaries for their money.

CONNAMARA, the name of a diſtrict, in the county of Galway, Ireland, noted for the woollen ſtockings knit there, and for the wild ſtate of the country. It is in the barony of Ballinahinch, and an account of it will be found under that name. See Ballinahinch.

CONNARUS, in *Botany*, (Κονναρος, the name of a tree deſcribed by Athenæus), Linn. Gen. 830. Schreb. 1116. Willd. 1268. Juſſ. 369, 452, 453. Claſs and order, *monadelphia decandria*. Nat. Ord. *Dumoſæ*, Linn. *Terebintaceæ*, Juſſ.

Gen. Ch. *Cal.* one-leafed, with five ſegments; or five-leaved. *Cor.* petals five, lanceolate, erect, equal. *Stam.* filaments ten, awl-ſhaped, connected at the baſe, (in pairs, Lam.), alternately larger and ſmaller; anthers roundiſh. *Piſt.* germ ſingle (except in one ſpecies), oblong, villous; ſtyle cylindrical; ſtigma obtuſe. *Peric.* capſules gibbous, one-celled, either two-valved or dehiſcent on one ſide. *Seed* ſingle, large.

Eſſ. Ch. Cal. five-cleft or five-leaved. Cor. five-petalled. Capſ. one-celled. Seed ſingle.

Species, 1. C. *aſiaticus.* Ceylon Sumach. Willd. 2. (C. *monocarpus.* Linn. Mart. 1. Rhus zeylanicus trifoliatus phaſeoli facie, floribus copioſis ſpicatis; Burm. Zeyl. 199. tab. 89. Phaſeolus arboreſcens zeylanicus monocarpus; Rai. Supp. 438.) "Leaves ternate; leaflets roundiſh, egg-ſhaped, one-nerved, veined." A tree. *Leaves* alternate, petioled; leaflets acuminate, quite entire, ſmooth, equal, petioled. *Racemes* erect, terminal. A native of the Eaſt Indies. 2. C. *pentagynus.* Lam. 1. Willd. 3. (Cavan. Diſſ. 7. 376. tab. 223.) "Leaves ternate; leaflets roundiſh, egg-ſhaped, three-nerved; flowers pentagynous." A tree. *Branches* cylindrical, ſmooth, leafy. *Leaves* alternate, acute, entire, ſmooth, ſomewhat coriaceous, finely veined underneath. *Flowers* ſmall, numerous, in axillary and terminal ſpikes, forming a kind of panicle; calyx villous on the outſide; piſtils from three to five, villous, ſhort, appearing united at the baſe; ſtyles ſhorter than the ſtamens; ſtigmas flat or truncated. Deſcribed by La Marck from dried ſpecimens without fruit, communicated by Sonnerat. A native of Madagaſcar and Guinea. 3. C. *africanus.* Mart. 2. Lam. 3. Willd. 1. Vahl. Symb. 3. 86. Cavan. Diſſ. 7. 375. tab. 221. (Omphalobium indicum; Gært. vol. i. 253. tab. 46. fig. 3, and vol. ii. præf. p. 33.) "Leaves ternate; leaflets oblong, veined, acuminate." Willd. "Leaves ternate, leaflets egg-ſhaped, acute at both ends, nerved underneath; flowers panicled, monogynous." Lam. A ſhrub. *Branches* cylindrical, ſmooth. *Leaves* alternate, petioled; leaflets four or five inches long, ſmooth, even-ſurfaced above, nerved and veined underneath. *Flowers* ſmall, numerous; panicle compound, oblong, terminal. *Capſules* oblong, almoſt cylindrical, gibbous on one ſide, pointed at both ends, pedicelled, two-valved. Lam. *Capſule* valveleſs, dehiſcent on the gibbous or outer ſide. *Seed* large, ſomewhat kidney-ſhaped, ſmooth, ſhining, dark cheſnut-coloured, with an oblong pit on each ſide; aril incomplete, fleſhy-glandular, variouſly lobed, ſo as to appear curled, its whole length cloſely adhering to the lower and exterior part of the ſeed. Gært. 4. C. *pinnatus.* Lam. 2. Illuſt. tab. 572. Willd. 5. Cavan. Diſſ. 7. 375. tab. 222. (Perimcurigil; Rheed. Mal. 6. 43. tab. 24.) "Leaves ternate and pinnated; leaflets oblong, veined; petals with two briſtles at the baſe." Willd. A tree. *Root* perennial. *Leaflets* of the ſame conſiſtence, and ſimilarly veined with thoſe of C. pentagynus. *Flowers* white, in terminal and axillary panicles; calyx villous on the outſide; petals lanceolate, with two remarkable briſtles a little above the baſe, one on each ſide, pointing downwards, acute and ſomewhat divaricating; germ ſingle, villous. *Capſules* oblong, gibbous one ſide, ſuddenly narrowed at the baſe, ending rather abruptly in a point, one-celled. *Seed* one. A native of the Eaſt Indies; deſcribed from ſpecimens communicated to La Marck by Sonnerat. 5. C. *Santaloides.* Mart. 3. Willd. 4. Vahl. Symb. 3. 87. (Santaloides; Flor. Zey. 408.) "Leaves pinnated; leaflets egg-ſhaped, acuminate; peduncles axillary, aggregate; flowers in racemes." A tree. *Branches* cylindrical, ſmooth. *Leaves* unequally pinnated, ſcattered, remote, petioled; leaflets ſometimes an inch and half long, quite entire, perfectly ſmooth, ſhining above, reticularly veined underneath, on very ſhort channelled petioles. *Peduncles* from four to ſix together, half the length of the leaf, ſmooth; partial ones ſcattered, with three or four pedicelled flowers towards the top. A native of the Eaſt Indies. 6. C. *mimoſoides.* Mart. 4. Willd. 7. Vahl. Symb. 387. "Leaves pinnated; leaflets about twenty-one, oval-oblong, emarginate; racemes axillary." A tree. *Branches* cylindrical, villous towards the top. *Leaves* growing near the ends of the branches, alternate, approximating, on ſlightly villous petioles; leaflets oppoſite or alternate, on very ſhort petioles, inner ones ſmaller, obtuſe, ſmooth, finely veined on the upper ſurface, paler underneath. *Peduncles* axillary, uſually three together, the length of the leaves, ſlightly hoary; pedicels ſcattered, filiform, the loweſt commonly two-flowered. *Flowers* ſmall, with a minute bracte at the baſe of each pedicel. A native of the iſlands of Nicobar.

Connarus *decumbens;* Willd. Vahl. See Hermannia *triphylla.*

Propagation and Culture. C. aſiaticus is uſually propagated in this country by laying down the young branches, which, if tongued in the manner practiſed for carnations, and duly watered, will put out roots in twelve months. They may then be cut off from the old plants, and planted in ſeparate ſmall pots, which ſhould be filled with light freſh earth and plunged into a moderate hot-bed. They ſhould afterwards be placed in a dry ſtove; but for about three months in ſummer they will bear the open air in a ſheltered ſituation. The cuttings of this plant will ſometimes take root, but without great care ſeldom ſucceed.

CONNATA Folia. See Leaf.

CONNAUGHT, in *Geography*, the name of the weſtern province of Ireland, which contains the counties of Galway, Mayo, Sligo, Leitrim, and Roſcommon. At the time of Strongbow's invaſion, it was a diſtinct kingdom, and its king was monarch of Ireland. This dignity continued until the reign of Henry III.; after which time, the province was divided amongſt petty chieftains, ſome of whom were of Engliſh extraction, until the reign of queen Elizabeth, when the earl of Suſſex, lord deputy, divided it into counties, A. D. 1562; and ſir H. Sidney, lord deputy, eſtabliſhed a lord preſident of Connaught, A. D. 1567. In 1604, ſir Arthur Chicheſter, lord deputy, eſtabliſhed a circuit for judges of aſſize in Connaught. At preſent, the diſtinction of provinces is not attended to in any public acts; and indeed, as calculated to keep up a provincial ſpirit, which has often led to bitter animoſities, it ought to be as much as poſſible diſcountenanced.

Connaught *Worms.* See Worm.

CONNAUX, in *Geography.* a town of France, in the department of the Gard, and diſtrict of Uzés; three leagues N.E. of Uzés.

CONNE, Cone, or Coyne Lough, in the county of Down, Ireland. See Strangford.

CONNEAUT, and alſo Ashtabula, are ſmall rivers of America, in the ſtate of Ohio, which form good harbours for boats and ſmall craft on the borders of lake Erie.

CONNECTICUT, one of the United States of America, called by the ancient nations *Qunnihticut*, lying between 41° and 42° 2′ N. lat., and between 71° 20′ and 73° 15′ W. long.; extending in its greateſt length 100 miles, and greateſt breadth 72 miles; and comprehending about 4674 miles, or about 2,640,000 acres. It is bounded on the north by Maſſachuſetts; on the eaſt by Rhode iſland; on the ſouth by the Sound, which ſeparates it from Long iſland; and on the weſt by the ſtate of New York. Connecticut is divided into eight counties, *viz.* Fairfield, the chief towns of which are Fairfield and Danbury; New Haven, with a capital of the ſame name; Middleſex, the chief towns of which are Middleton and Haddam; and New London, the chief towns of which are New London and Norwich; which four counties extend along the Sound from W. to E.: Litchfield, Hartford, Tolland, and Windham, each having a capital of the ſame name reſpectively, which four counties extend in the ſame direction with the former on the border of the ſtate of Maſſachuſetts. Theſe counties contain about 100 townſhips, which are ſubdivided into pariſhes, each of which has one or more places of public worſhip, ſchool-houſes at convenient diſtances, and a college at New Haven. See College. Each townſhip is a corporation, inveſted with ſufficient powers for its own regulation. The number of repreſentatives is ſometimes 180; but more commonly about 160. The principal rivers in this ſtate are Connecticut, Houſatonick, and the Thames, with their branches; which ſee reſpectively. The whole ſea-coaſt is indented with harbours, which are ſafe and commodious; but the principal are thoſe of New Haven and New London. This ſtate ſends ſeven repreſentatives to Congreſs. The inhabitants are almoſt wholly of Engliſh deſcent, beſides whom they have no Dutch, French, or Germans, and few Scots or Iriſh. The original ſtock, from which have ſprung all the preſent occupiers of Connecticut, and the nnmerous emigrants from hence to every part of the United States, conſiſted of 3000 perſons, who ſettled in the towns of Hartford, New Haven, Windſor, Guilford, Milford, and Weathersfield, about the years 1635 and 1636. In 1756 the population amounted to 130,611 perſons; in 1774 to 197,856; in 1782 to 202,877 whites, and 6273 Indians and negroes; in 1790 to 237,946, of whom 2764 were ſlaves; and by the cenſus in 1800, to 251,002, of whom 121,113 were free white males, 123,528 free white females, 5300 free perſons, except Indians, not taxed, and 951 ſlaves.

Connecticut, notwithſtanding the changes of temperature to which it is ſubject, is very healthful. The ſurface of the country exhibits mountains, hills, and vallies; and though it is very well watered, ſome ſmall parts of it are barren. Its chief productions are Indian corn, rye, wheat, oats, barley, and buck-wheat; flax in abundance, ſome hemp, potatoes of ſeveral kinds, pumpkins, turnips, peas, beans, &c., together with fruits of all kinds which are common to the climate. The ſoil is well adapted for paſturage and mowing, ſo that the farmers are enabled to feed a great number of neat cattle and horſes. This ſtate carries on its chief trade with the Weſt India iſlands, in veſſels from 60 to 140 tons. Its exports conſiſt of horſes, mules, oxen, oak-ſtaves, hoops, pine-boards, oak-planks, beans, Indian corn, fiſh, beef, pork, &c.; and a large number of coaſting veſſels is employed in carrying the produce of Connecticut to the other ſtates; from which they receive in return, rice, indigo, and money. But as New York is nearer, much of its produce, particularly that of the weſtern parts, is carried thither; ſuch as pot and pearl-aſhes, flax-ſeed, beef, pork, cheeſe, and butter, in large quantities. The value of the whole exported produce and commodities from this ſtate, before the year 1774, was then eſtimated at about 200,000*l.* lawful money, annually. In the year ending September 30, 1791, the amount of foreign exports was 710,340 dollars, beſides articles carried to different parts of the United States to a great amount; in 1792 it was 749,925 dollars; in 1793, 770,239 dollars; in 1794, 806,746 dollars; and in 1804, 1,516,110 dollars, comprehending 1,486,882 domeſtic and 29,228 foreign. This ſtate owns and employs in the foreign and coaſting trade more than 32,897 tons of ſhipping. The farmers in Connecticut are generally clothed in plain, decent, homeſpun cloth; and both their linens and woollens are domeſtic manufactures, ſtrong though coarſe; and many of their cloths are fine and handſome. This ſtate has large orchards of mulberry trees, and ſilkworms have been reared with ſuch ſucceſs, that they promiſe a ſupply of ſilk, not only to the inhabitants, but alſo for exportation. New Haven has linen and button manufactories; they have eſtabliſhed a woollen manufactory at Hartford, beſides glaſs works, a ſnuff and powder mill, iron works, and a ſlitting mill. Iron works are alſo eſtabliſhed at Saliſbury and Norwich, and in other parts of the ſtate. Stafford has a furnace, at which are made large quantities of hollow ware, and other ironmongery, ſufficient for the ſupply of the whole ſtate. Paper is manufactured at Norwich, Hartford, New Haven, and in Litchfield county. Ironmongery, hats, candles, leather, ſhoes and boots are manufactured in this ſtate.

Connecticut is laid out in ſmall farms, from 50 to 300 and 400 acres each, which are held by the farmers in fee-ſimple, and are generally well cultivated. The ſtate is chequered with innumerable roads or highways, croſſing each other in every direction; nor can a traveller paſs more than two or three miles, even in the moſt unſettled parts, without finding a houſe or cottage, and a farm in ſuch a condition of improvement as to afford neceſſaries for the ſupport of a family. The whole ſtate, it is ſaid, reſembles a well-cultivated garden, which by induſtry produces the neceſſaries and conveniences of life in great plenty, without its luxuries. To the agricultural mode of life prevailing in this ſtate, which is favourable to temperance and health, and to the eaſe with which a comfortable ſubſiſtence may be obtained, ſo encouraging to early marriage, and alſo to the religious liberty that is maintained, we may aſcribe the rapid advance of this ſtate in population. Luxury has not yet found its way into this ſtate, nor contaminated the manners of the people. The common mode of travelling, both for men and women, is on horſeback; in this ſtate there are few coaches, but many chaiſes and whiſkeys. In the winter is uſed the ſleigh, which is a vehicle drawn by two horſes, and carrying ſix perſons in its box, which hangs on four poſts ſtanding on two ſteel ſliders, or large ſkaites. Dancing, fiſhing, hunting, ſkaiting, and riding in ſleighs on the ice, are the chief amuſements in this ſtate. The men, in general, throughout this province, are tall, ſtout, and robuſt; the women are fair, handſome, and genteel; ſtrictly virtuous, and well-informed. We may obſerve, in general, that there is no part of the world in which the education of all ranks of people is more an object of attention than in this ſtate. Almoſt every town is divided into diſtricts, each of which has a public ſchool kept in it during a great part of the year. Somewhat more than one-third of the money ariſing from a tax on the polls and rateable eſtate of the inhabitants, is appropriated to the ſupport of ſchools in the ſeveral towns, for the education of children and youth. The law enjoins that a grammar-ſchool ſhall be kept in every county-town throughout the ſtate. A certain gravity and ſeriouſneſs of deportment, accompanied with a degree of ſhyneſs and reſerve, appear in the firſt intercourſe of the inhabitants with ſtrangers; but after a ſhort acquaintance, they become very familiar and inquiſitive. Their hoſpitality is exemplary and laudable. In their character there is a certain trait, which renders them leſs amiable; and that is their fondneſs for ſettling even their trivial diſputes "according to law;" and the prevalence of this litigious ſpirit affords employment for a numerous body of lawyers. This party ſpirit is, however, ſubſiding; their public proceedings are conducted with calmneſs and candour; and as they are well informed with regard to their rights, and judicious in the methods they adopt for ſecuring them, the ſtate enjoys a great ſhare of political tranquillity. Another circumſtance, favourable to internal peace and harmony, is the abatement of that rage for theological diſputation which formerly prevailed. The religion, or at leaſt the church government and diſcipline, of this ſtate, is ſuch as ſeems to be peculiarly adapted to a republican government. Each church has a ſeparate juriſdiction, and claims authority to chuſe its own miniſter, to exerciſe judgment, and to enjoy religious inſtitutions, within itſelf. The churches, however, amounting, ſays Morſe, to about 200, of the congregational denomination, in which are about 20,000 communicants and 170 paſtors, are not ſtrictly independant of each other; they aſſociate for mutual convenience and benefit. The aſſociations have power to licence candidates for the miniſtry, to conſult for the general welfare, and to recommend the adoption of meaſures by the churches, but have no authority to enforce them. Of theſe aſſociations there are eleven in the ſtate, and they meet twice in a year. All theſe are combined in one general aſſociation formed in 1709, conſiſting of delegates from the ſeveral aſſociations which meet annually. All forms of religion that are conſiſtent with the peace of ſociety are tolerated in Connecticut; and a ſpirit of liberality and catholiciſm is ſaid to be increaſing. In this ſtate there are few religious ſects; the majority of the people conſiſt of congregationaliſts. Beſides theſe there are epiſcopalians and baptiſts; the epiſcopalian churches are reſpectable, and are under the ſuperintendance of a biſhop.

The conſtitution of Connecticut is founded on its charter, which was granted by Charles II. in 1662, and on a law of the ſtate. Agreeably to this charter, the ſupreme legiſlative authority of the ſtate is veſted in a governor, deputy-governor. 12 aſſiſtants or counſellors, and the repreſentatives of the people, ſtyled the General Aſſembly. The governor, deputy-governor, and aſſiſtants, are annually choſen by the freemen in the month of May. The repreſentatives (whoſe number is not to exceed two from each town) are choſen by the freemen twice a year, to attend the two annual ſeſſions, on the ſecond Tueſday of May and October. The general aſſembly is divided into two branches, called the upper and lower houſes: the former is compoſed of the governor, deputy-governor, and aſſiſtants; and the latter conſiſts of the repreſentatives of the people. No law can paſs without the concurrence of both houſes. They have ſeveral law courts, of which the ſuperior conſiſts of five judges. The general aſſembly only have power to grant pardons and reprieves; to iſſue commiſſions of bankruptcy; or to protect the perſons and eſtates of unfortunate debtors. The feudal ſyſtem of deſcents was never adopted in this ſtate: the whole real eſtate of inteſtates is divided equally among the children, males and females; and all eſtates given in tail muſt be given to ſome perſon then in being, or to their immediate iſſue, and ſhall become fee-ſimple eſtates to the iſſue of the firſt donee in tail. The widow of an inteſtate is entitled to a third part of the perſonal eſtate for ever, and to her dower, or third part of the houſes and lands belonging to the inteſtate at the time of his death, during her life. Attornies are admitted and qualified by the county courts. Before their admiſſion to the bar, they muſt ſtudy two years with a practiſing attorney in the ſtate, if they have had a college education, and three years if they have not: their morals muſt be unblemiſhed, and they muſt be examined by the attornies of the court of the county where they are admitted, and be by them recommended to the court. There are, upon an average, about 15 attornies to each county, and 120 in the whole ſtate.

The American revolution, which ſo eſſentially affected the government of moſt of the colonies, produced no very perceptible alteration in the government of Connecticut. While under the juriſdiction of Great Britain, they elected their own governors, and all ſubordinate civil officers, and made their own laws, in the ſame manner, and with as little controul, as they now do.

The preſent territory of Connecticut, at the time of the firſt arrival of the Engliſh, was poſſeſſed by the Pequot, the Mohegan, Podunk, and many other ſmaller tribes of Indians. The Pequots were numerous and warlike; and their country extended along the ſea-coaſt from Paukatuck to Connecticut river: and about the year 1630, this powerful tribe extended its conqueſts over a conſiderable part of Connecticut, Long Iſland, and a part of Narraganſet, the ancient Indian name of New London; the ſeat of the ſovereign of the whole nation was Pequot. The Mohegans were numerous, and their territory extenſive; it comprehended moſt of New London county, almoſt the whole county of Windham, and a part of the counties of Tolland and Hartford. The Podunks inhabited Eaſt Hartford, and the circumjacent country. In 1774 there remained of the deſcendants of the ancient nations only 1363 perſons; moſt of whom lived at Mohegan, between Norwich and New London. From the rapid decreaſe of the Indians, it is concluded that their number in this ſtate does not now exceed 400.

The firſt grant of Connecticut was made by the Plymouth council to the earl of Warwick in 1630; and, in the following year, he aſſigned this grant to lord Say or Seal, lord Brook, and others. In 1633, an attempt was made on the Engliſh ſettlements by a number of Indian traders, who ſettled at Windſor. In the ſame year, a little before the arrival of the Engliſh, ſome Dutch traders ſettled at Hartford, the remains of whoſe ſettlements are ſtill viſible on the banks of Connecticut river. In 1634, lord Say and Seal, &c. ſent over a ſmall number of perſons, who built a fort at Saybrook, and made a treaty with the Pequot Indians for the lands on Connecticut river. A number of adventurers afterwards ſettled in this province; and in 1644, they purchaſed of the agent of lord Say and Seal, and lord Brook, their right in the colony of Connecticut for 1600*l.* Connecticut and New Haven continued two diſtinct governments for many years; they extended their territories and rapidly increaſed. At length, John Winthrop, eſq., who had been choſen governor of Connecticut, was employed to ſolicit a charter, which was obtained from Charles II. in 1662. Some jealouſy ſubſiſted for a little while between this colony and that of New Haven; but in 1665 theſe two colonies formed an union, which has ever ſince amicably ſubſiſted; and the charter of king Charles continues to be the baſis of their government. At the cloſe of the revolution, Connecticut ceded all her charter claims weſt of Pennſylvania to Congreſs, reſerving only a tract of land as wide as the ſtate of Connecticut, and 120 miles in length; bounded eaſt on the weſtern line of Pennſylvania, and north by lake Erie, containing nearly four millions of acres. The ceſſion was accepted by Congreſs, which eſtabliſhes to Connecticut her title to theſe lands. Morſe's Geog.

CONNECTICUT, the moſt conſiderable river in the eaſtern part of the United States, which riſes in the highlands which ſeparate the ſtates of Vermont and New Hampſhire from Lower Canada. This river has been ſurveyed about 25 miles beyond the 45th degree of latitude to the head ſpring of its northern branch; from which to its mouth it is upwards of 300 miles, purſuing its courſe through a ſettled country, and having on its banks a great number of the moſt flouriſhing and pleaſant towns in the United States.

It is from 80 to 100 rods wide, at the diſtance of 130 miles from its mouth. Its courſe between Vermont and New Hampſhire is generally S.S.W., and alſo through Maſſachuſetts, and part of Connecticut, until it reaches the city of Middleton; after which it runs in a S.S.E. direction to its mouth, fertilizing the lands through which it flows, though its navigation is much obſtructed by a great variety of falls. At its mouth alſo is a bar of ſand, which very much impedes its navigation; however this river is navigable to Hartford city, upwards of 50 miles from its mouth; and the produce of the country for 200 miles above it, is brought thither in boats, which are flat-bottomed, long and narrow, and ſo light as to be portable in carts. Before the conſtruction of locks and canals on this river, they were taken out at three different carrying places, all of which made 15 miles; but theſe obſtructions will, probably, be ſoon wholly removed. Sturgeon, ſalmon, and ſhad, are caught in plenty in their ſeaſon, from the mouth of the river upwards, excepting ſturgeon, which do not aſcend the upper falls; beſides a variety of ſmall fiſh, ſuch as pike, carp, perch, &c.

Connecticut is alſo the name of a ſtream in Long Iſland, in the ſtate of New York, which falls into a bay at the S. ſide of the iſland.

Connecting *Oil.* See Oil.

CONNECTION, or Connexion, a relation whereby one thing adheres to, or depends on another.

Euclid's propoſitions have ſuch a connection among themſelves, that the latter cannot ſubſiſt without the former.

Connection, or *continuity*, in the *Drama*, conſiſts in the joining of the ſeveral ſcenes together.

When the ſcenes of an act ſucceed one another immediately, and are ſo joined as that the ſtage is never left empty, the connection is ſaid to be obſerved.

CONNECTIVES, in *Grammar*, one of the four ſpecies under which, according to Mr. Harris, all words may be included. They are of two kinds, and as they connect ſentences or words, are called by the different names of Conjunctions and Prepositions. Hermes, p. 31, and 237.

CONNELSVILLE, in *Geography*, a town of America, in the county of Waſhington and ſtate of Pennſylvania, pleaſantly ſituated on the Yohiogany, ſettled about ten years, and containing about 80 houſes and 400 inhabitants.

CONNER, Ale. See Ale-*Conner*.

CONNERE', in *Geography*, a town of France, in the department of the Sarthe; 4 leagues E.N.E. of Le Mans.

CONNETABLE *ou Conneſtable de France*, conſtable of France. In the origin of this title, the connetable, who ſucceeded the grand ſénéchal of France, was conſidered as one of the firſt domeſtics of the French kings, in ſhort as maſter of the horſe. Afterwards he became the firſt officer of the crown, chief and conductor of the armies, firſt ſerjeant of the king for executing his orders and commands; for laying hands on the grandees, impriſoning them, and repreſenting them in juſtice. This employment became by degrees ſo eminent, that the marſhals of France were only lieutenants. This office was aboliſhed in the reign of Louis XIII. Anne de Montmorency, who loſt his head on a ſcaffold, was the laſt who filled it.

CONNETABLIE *de France.* This was a particular corps under the orders of the ſeigniors marſhals of France, and conſiſted of 48 guards on horſeback.

CONNIE, in *Geography*, a ſmall river of France, in the department of Eure and Loir, remarkable for being ſo completely dried up in winter, that the fiſh are obliged to hide themſelves in the cavities where there is a little water remaining; in ſummer, on the contrary, its ſtream is always copious.

CONNIVENTES Valvulæ, in *Anatomy*, are folds of the internal, or villous coat, of the ſmall inteſtine. See Intestine.

CONNOIE Bay, in *Geography*, a bay on the S. coaſt of Newfoundland; 50 miles E. of Cape Ray.

CONNOISSEUR, a French term, of late uſed in Engliſh: it literally denotes a perſon well verſed in any thing; being formed of the verb *connoitre, to know, underſtand.* Hence it comes to be uſed in our language for a critic, or perſon who is a thorough judge, or maſter in any way; particularly in matters of painting and ſculpture.

CONNON, in *Geography*, a river of France, called alſo *Aa*, which runs into the Beuvron, ſix miles S.E. of Beuvron.

CONNOR, Bernard, *in Biography*, a native of Dublin, in Ireland, where he was born in 1666, received his education at an academy in France, and at a proper age was ſent to Montpellier, where he was made doctor in medicine in the year 1690. He was ſoon after engaged to ſuperintend the education of two young Poliſh noblemen, with whom, after reſiding ſome time at Paris, he travelled over Italy, and the iſland of Sicily, and then went to Poland, where he was appointed phyſician to the king. This did not, however, detain him long in Poland, as we find him practiſing in London, and made fellow of the College of Phyſicians, and of the Royal Society, in the year 1696. He had publiſhed, the preceding year, "Diſſertationes Medico-Phyſicæ de Antris lethiferis, de Montis Veſuvii incendio, de ſtupendo oſſium coalitu. Oxoni, 8vo." He had ſeen, while in Italy, an eruption of Mount Veſuvius, and had viſited the Grotto del Cano, of both which he gives deſcriptions, and of a ſkeleton, in which the vertebræ, ribs, and oſſa innominata, were all firmly united. "Tentamen Epiſtolare de Secretione Animali," in which he attempts to account for the difference in the colour, taſte, and other ſenſible qualities of the humours, ſecreted from the blood. "Evangelium Medici, ſeu Medicina Myſtica de ſuſpenſis Naturæ legibus, Lond. 1697, 8vo.," and in 1698, in the latter part of which year he died, "A compendious Plan of the Body of Phyſic," apparently a text-book, from which he had given, or had propoſed giving, a courſe of lectures. To this work he added, a ſhort, but entertaining, account of Poland. Haller. Bib. Med. Eloy. Dict. Hiſt.

Connor, in *Geography*, a village in the county of Antrim, Ireland, that gives name to a biſhopric which was united to that of Down in 1454, and which extends over moſt of the county of Antrim. It contains 395,000 Iriſh acres, which are divided into 76 pariſhes; but from unions, there are only 40 benefices and 43 churches. The church of Liſburn was, by letters patent of James I., made the cathedral; that of Connor is in ruins. Connor is 97 Iriſh miles N. from Dublin, and 17 N. from Belfaſt. Beaufort.

Connor, a river of the iſland of Jamaica, which runs into the ſea, between Rocky point, and port Morant.

CONNTHAL. See Caverium.

CONO, in *Commerce*, a Florence wine meaſure of 10 barrels, each barrel being about 12 gallons.

CONOBEA, in *Botany*, Aubl. See Conopea.

CONOCARPODENDRON. See Protea and Pinus.

CONOCARPUS, (from κωνος, a *cone*, and καρπος, *fruit*) Linn. Gen. 236. Schreb. 321. Willd. 366. Lam. Ill. 353. Gært. 1052. Juſſ. 75. Conocarpe. Enc. Claſs and order, *pentandria*

pentandria monogynia, Nat. Ord. *Aggregatæ*, Linn. *Elæagni*. Juſſ.

Gen Ch. *Cal.* one-leafed, ſuperior, very ſmall, five-cleft; ſegments acute, erect. *Cor.* none (or five-petalled?) *Stam.* Filaments five or ten, awl-ſhaped, erect; anthers globular. *Piſt.* Germ inferior, compreſſed, obtuſe; ſtyle ſimple, ſhort; ſtigma obtuſe. *Peric.* none; Linn. Schreb. Samara; Gært. Capſule very ſmall; rounded, compreſſed, convex and gibbous on the outſide, concave within, with a membranous margin on each ſide, not dehiſcent, one-celled. *Seed* ſolitary, inverſely egg-ſhaped. Lam.

Eſſ. Ch. Corolla five-petalled or none. Seeds naked, ſolitary, inferior. Flowers aggregate. Willd.

Flowers aggregate. Calyx ſuperior, five-cleft. Corolla none. Capſules many, one-ſeeded, affixed to a common axis, imbricated into a cone. Lam.

Sp. 1. C. *erecta*. Linn. Sp. Pl. 1. Mart. 1. Lam. 1. Willd. 1. Jacq. Amer. 78. tab. 22. fig. 1. Lam. Ill. tab. 126. fig. 1. Gært. tab. 177. (C. mangharia; Cates. Car. 2. tab. 33. C. foliis oblongis, floribus in caput conicum. Brown. Jam. 159. Alnus; Pluk. Alm. 18. tab. 240. fig. 3. Alni fructu laurifolia arbor; Sloan. Jam. 135. hiſt. 2. tab. 161. fig. 2. Rudbeckia laurifolia maritima; Amm. herb. 581. Innominata; Plum. MSS. Burm. Amer. tab. 144. fig. 2.) "Erect; leaves lanceolate." Linn. "Erect; leaves lanceolate; cones panicled, pedicelled." Lam. A tree, about thirty feet high. Younger branches angular. *Leaves* alternate from two inches and a half, to three inches long, one inch broad, acute, quite entire, ſmooth, greaſy to the touch, on ſhort petioles, which have frequently two lateral glands near the baſe. *Flowers* greeniſh yellow, ſmall, in globular heads, on ſhortiſh pedicels; common peduncles longer, axillary and terminal, branching into racemes which altogether form a kind of panicle. *Capſules* umbilicated, pubeſcent at their ſummit, cloſely imbricated into roundiſh cones, about the ſize of a pea. Jacquin attributes to his plant ten ſtamens, twice as long as the calyx; but other ſpecimens have only five, about the length of the calyx. They are probably different ſpecies. A native of the Weſt Indies, and the tropical coaſts of America; where it is called button wood or button tree, by the Engliſh, and mangle ſaragoza by the Spaniards. It is uſed for fire wood, but is of little value for any other purpoſe. 2. C. *procumbens*. Linn. Sp. Pl. 2. Mart. 2. Lam. 2. Willd. 2. Jacq. Amer. 79. tab. 52. fig. 2. Pict. 42. tab. 260. fig. 22. (Rudbeckia ſupina; Amm. herb. 581.) "Procumbent; leaves inverſely egg-ſhapped." Linn. "Procumbent; leaves inverſely egg ſhaped; cones ſomewhat racemed, ſeſſile." Lam. A much branched ſhrub, almoſt entirely procumbent, following the irregularities of the rocks among which it grows. *Leaves* alternate, an inch or an inch and a half long, entire, ſhining, on ſhort petioles; petioles with an oblong gland on the edge near the baſe, on each ſide. *Flowers* pentandrous and hexandrous, reſembling thoſe of the preceding ſpecies, but ſmaller, and producing cones of a looſer texture. A native of the iſland of Cuba. 3. C. *racemoſa*. Linn. Syſt. Nat. 3. Mart. 3. Willd. 3. Jacq. Amer. 80. tab. 53. Pict. 42. tab. 79. Brown. Jam. 159. n. 1. "Leaves lanceolate; egg-ſhaped, ſomewhat obtuſe; fruit not aggregate." A lofty branching tree, ſometimes dividing into three or four trunks cloſe to the ground. Younger branches oppoſite, red, ſhining. *Leaves* oppoſite, about three inches long, petioled, coriaceous, thickiſh, ſhining, greaſy to the touch, deep green; petiole with two glands at the top. *Flowers* ſmall, ſeſſile, remote, in terminal panicles, compoſed generally of three ſimple, or ſomewhat branched, looſe racemes, many of them abortive; petals five; ſtamens ten, alternately ſhorter. *Fruit* ſeparate; pericarp a coriaceous capſule, containing one or two ſeeds. *Seeds* compoſed of two greeniſh lamellæ, wrapped up into a round body, and involved in a very thin membrane. The lamellæ in the baſe of the pericarp become a round obtuſe ſhining body, forming the axis of the ſeed, deſtined to put forth the roots; for when the capſule falls to the ground, it penetrates the crowned apex, and when the fibres take poſſeſſion of the ſoil, it conſtitutes the rudiment of the future trunk; then the lamellæ increaſing in bulk, burſt the capſule, and become the radical leaves. A native of the Caribbee iſlands, and the neighbouring continent, on ſandy and muddy ſhores; called by the Engliſh white mangrove, and by the Spaniards mangle bobo, or fooliſh mangle.

Obſ. Juſſieu, in his Genera Plantarum, queſtions whether this ſpecies be really a conocarpus. Gærtner obſerves, that Juſſieu's doubt is well founded. La Marck, accordingly, in the Encyclopedie Methodique, excludes it from the genus, promiſing to deſcribe it under manglier, one of the French names for the rhizophora of Linnæus. But Deſrouſſeaux, who, on the ſeceſſion of La Marck, afterwards wrote that article, inſtead of attending to his predeceſſor's reference, and miſled by an ambiguity in the popular uſe of the French word, conſiders it as ſynonymous with conocarpus, and actually gives over again the character of that genus, with the deſcription of La Marck's two acknowledged ſpecies; entirely omitting the conocarpus racemoſa of Linnæus, and not making any farther reference concerning it. This plant ſeems to be ſui generis; for, although the account of the manner in which its ſeed germinates, which we have copied from profeſſor Martyn's Miller, is obſcurely expreſſed; it evidently belongs to Savigny's new natural order paleturier, publiſhed in the Encyclopedie Methodique; but cannot be referred either to bruguiera or to rhizophora, the only two genera of that order, and both included in the rhizophora of Linnæus. See PALETURIER, BRUGUIERA, and RHIZOPHORA. La Marck's eſſential character of conocarpus is drawn up with a view to the excluſion of this ſpecies, and Willdenow's to its admiſſion; the latter, however, has very imperfectly ſucceeded, for his deſcription of C. racemoſa, which ſays expreſsly *flores remoti*, is obviouſly at variance with *flores aggregati* in his eſſential character.

CONOID, CONOIDES, in *Geometry*, a ſolid body, reſembling a cone, except in this, that the ſlant ſides from the baſe to the vertex are not ſtraight lines, as in the cone, but curved.

The conoid is produced by the entire circumvolution of a conic ſection around its axis; and according to the denomination of the ſection from which it is generated, it is differently denominated: if, *v. gr.* the ſolid be produced by the motion of a parabola, it is called a *parabolic conoid*, or *paraboloid;* if by that of an hyperbola, an *hyperbolic conoid*, or *hyperboloid;* and an *elliptic conoid*, or a *ſpheroid*, when produced by the rotation of an ellipſis round one of its axes. See each of theſe articles; and for determining their ſuperficies and ſolidity; ſee SUPERFICIES and SOLIDITY.

If a conchoid, *i.e.* any ſolid formed by the revolution of a conic ſection about its axis, ſuch as a ſpheroid, paraboloid, or hyperboloid, be cut by a plane in any poſition; the ſection will be ſome conic ſection, and all the parallel ſections will be like and ſimilar figures.

Let A B C (*Plate* I. *Conics*, *fig.* 10.) be the generating ſection, or a ſection of the given ſolid through its axis B D, and perpendicular to the propoſed ſection A F C, their common interſection being A C; let G H be any other line meeting the generating ſection in G and H, and interſecting A C in E; and erect E F perpendicular to the plane A B C, and meeting the propoſed plane in F. Then, if A C and G H be conceived to move continually parallel to themſelves, will the rectangle $AE \times EC$ be to the rectangle $GE \times EH$, always in a conſtant ratio; but if G H be perpendicular to B D, the points G, F, H will be in the circumference of a circle whoſe diameter is G H, ſo that $GE \times EH$ will be $= EF^2$; conſequently, $AE \times EC$ will be to EF^2, always in a conſtant ratio; and therefore A F C is a conic ſection, and every ſection parallel to A F C will be of the ſame kind with, and ſimilar to it. Hence,

1. The above conſtant ratio, which $AE \times EC$ has to EF^2, is that of KI^2 to IN^2, the ſquares of the diameters of the generating ſection reſpectively parallel to A C, G H; that is, the ratio of the ſquare of the diameter parallel to the ſection to the ſquare of the revolving axis of the generating plane. This will appear, by conceiving A C and G H to be moved into the poſitions K L, M N, interſecting in I, the centre of the generating ſection.

2. It appears alſo that the axis A C and 2 E F of the ſection, ſuppoſing E now to be the middle of A C, will be to each other, as the diameter K L is to the diameter M N of the generating ſection.

3. If the ſection of the ſolid return into itſelf, it will evidently be an ellipſe. This always happens in the ſpheroid, except when it is perpendicular to the axis; which poſition is alſo to be excepted in the other ſolids, the ſection being then always a circle; in the paraboloid, the ſection is always an ellipſe, excepting when it is parallel to the axis; and in the hyperboloid, the ſection is always an ellipſe, when its axis makes with the axis of the ſolid an angle greater than that which the ſaid axis of the ſolid makes with the aſymptote of the generating hyperbola: the ſection being an hyperbola in all other caſes, except when thoſe angles are equal, and then it is a parabola.

4. If the ſection be parallel to the fixed axis B D, it will be of the ſame kind with, and ſimilar to, the generating plane A B C; that is, the ſection parallel to the axis, in a ſpheroid, is an ellipſe ſimilar to the generating ellipſe; in the paraboloid, the ſection is a parabola ſimilar to the generating parabola; and in an hyperboloid, it is an hyperbola ſimilar to the generating hyperbola of the ſolid.

5. In the ſpheroid, the ſection through the axis is the greateſt of the parallel ſections; in the hyperboloid, it is the leaſt; and in the paraboloid, all the ſections parallel to the axis are equal to one another. For the axis is the greateſt parallel chord line in the ellipſe, but the leaſt in the oppoſite hyperbolas, and all the diameters are equal in a parabola.

6. If the extremities of the diameters, K L, M N, be joined by the line K N, and A O be drawn parallel to K N, and meeting G E H in O, E being the middle of A C, or AE the ſemi-axis, and G H parallel to M N: then will E O be equal to E F, the other ſemi-axis of the ſection. For, by ſimilar triangles, $KI : IN :: AE : EO$. Or, upon G H as a diameter deſcribe a circle meeting E Q, perpendicular to G H, in Q; and E Q is evidently equal to the ſemi-diameter E F.

7. If A P be drawn parallel to the axis B D of the ſolid, and meet the perpendicular G H in P, it will be evident that, in the ſpheroid, the ſemi-axis $EF = EO$ will be greater than E P; but in the hyperboloid, the ſemi-axis $EF = EO$, of the elliptic ſection, will be leſs than E P, and in the paraboloid, $EF = EO$ is always equal to E P.

Scholium. The analogy of the ſections of an hyperboloid to thoſe of the cone, is very remarkable; all the three conic ſections being formed by cutting an hyperboloid in the ſame poſitions as the cone is cut. Thus, let an hyperbola and its aſymptote be revolved together about the tranſverſe axis, the former deſcribing an hyperboloid, and the latter a cone circumſcribing it; then let them be ſuppoſed to be both cut by a plane in any poſition, and the two ſections will be like, ſimilar, and concentric figures: that is, if the plane cut both the ſides of each, the ſections will be concentric, ſimilar ellipſes; if the cutting plane be parallel to the aſymptote, or to the ſide of the cone, the ſections will be parabolas; and in all other poſitions the ſections will be ſimilar and concentric hyperbolas. That the ſections are like figures appears from the foregoing corollaries. That they are concentric will be evident, when we conſider that Cc is $= Aa$, producing A C both ways to meet the aſymptotes in a and c. And that they are ſimilar or have their tranſverſe and conjugate axes proportional to each other, will appear thus:—Produce G H both ways to meet the aſymptotes in g and h; and on the diameters G H, gh, deſcribe the ſemi-circles G Q H, gRh, meeting E Q R, drawn perpendicular to G H, in Q and R; E Q and E R being then evidently the ſemi-conjugate axes, and E C, Ec, the ſemi-tranſverſe axes of the ſections. Now, if G H and A C be conceived to move parallel to themſelves, $AE \times EC$ or CE^2 will be to $GE \times EH$ or EQ^2 in a conſtant ratio, or C E to E Q will be a conſtant ratio; and ſince cE is as Eg, and aE as Eh, $aE \times Ec$ or cE^2 will be to $gE \times Eh$ or ER^2, in a conſtant ratio; but at an infinite diſtance from the vertex, C and c coincide, or $EC = Ec$, as alſo $EG = Eg$; conſequently $EQ = ER$, and then C E to E Q will be $= cE$ to E R; but as theſe ratios are conſtant, if they be equal to each other in one place, they muſt be always ſo; and conſequently $CE : cE :: QE : ER$. This analogy of the ſections will not ſeem ſtrange, when we conſider that a cone is a ſpecies of the hyperboloid; or a triangle a ſpecies of the hyperbola, whoſe axes are infinitely little. See Hutton's Menſuration, part iii. § 4.

The famous ſolid of the leaſt reſiſtance, ſir Iſaac Newton, M. Fatio, and the Marquis De l'Hopital, have demonſtrated to be a conoid.

CONON, in *Biography*, the ſon of Timotheus, and a celebrated general of Athens. He was one of thoſe who ſucceeded Alcibiades, after that celebrated commander had fallen into diſgrace with his countrymen, and diſtinguiſhed himſelf in the Peloponneſian war. See PELOPONNESUS. In an engagement with Callicratidas, the Spartan general, he was defeated; but he afterwards obtained a complete victory, when his antagoniſt loſt his life. About four hundred years before the Chriſtian æra, Conon and Philocles with their fleets were attacked and defeated by Lyſander, the leader of the Spartans. So complete was this victory that Conon barely eſcaped with his life, and ſought refuge in the iſle of Cyprus, while Athens itſelf was reduced to a ſtate of ſervitude, and its conſtitution deſtroyed. In Cyprus, Conon uſed every means in his power to reſcue his country from the ſtate into which ſhe had fallen; he applied to Artaxerxes, the Perſian monarch, for aid againſt the Spartans; obtained his deſires, and was appointed admiral of a large Perſian fleet, which Artaxerxes ſent to ſuccour the Athenians and other Greek ſtates. He had not long been raiſed to this honourable ſituation, when the ſailors mutinied for want of pay: the general haſtened to the court of Perſia, but was not ſuffered to approach the ſovereign, unleſs he ſubmitted to a ſpecies of adoration very unworthy of a noble and dignified mind; this he refuſed, and though denied an audience with his majeſty, his remonſtrances produced the deſired effect, and he was allowed to nominate his own treaſurers to the fleet. Conon reſumed his command, attacked the Spartan admiral Piſander, whom he killed with his own hand; the Spartans were defeated with the loſs of fifty ſhips, and the reſt were glad to ſeek ſhelter in one of their own ports. Conon, having thus obtained the dominion of the ſeas, returned to Attica with plans for reſtoring his country to its former honours. Scarcely had he begun his operations when he was accuſed of a miſapplication of the royal money, and was apprehended for that and other crimes, for which there appears to have been little or no foundation. He did not, however, ſurvive the accuſation; but the manner and particular time of his death are not known, though it was ſuſpected that he was baſely murdered in priſon. Plutarch. Univer. Hiſt.

Conon, a mathematician of conſiderable celebrity at Samos, flouriſhed about three centuries, and died about the year 223, B.C. He was a contemporary and friend of Archimedes, to whom he communicated his writings, and ſent ſome problems, which Archimedes received with approbation, wiſhing them to be publiſhed during the lifetime of their author, in order that from him they might receive a juſt demonſtration. Conon made many obſervations on the eclipſes of the ſun and moon, and gave the name to the conſtellation called Coma-Berenices. His death happened during the period when Archimedes flouriſhed, whoſe eulogium for his friend has come down to the preſent times: ſpeaking of his great genius, he aſks: "How many theorems in geometry, which to others ſeemed impoſſible, would, had Conon lived, have been brought to perfection?" Conon invented a ſpiral, the properties of which having been demonſtrated by Archimedes, it has obtained the name of Archimedes's ſpiral. He is referred to with reſpect in the writings of Propertius and Virgil. Hutton. Moreri. See Conic *Sections*.

Conon, Pope, was by birth a Thracian, and educated in Sicily; from this iſland he went to Rome, where he was ordained preſbyter. Upon the death of pope John V., the diſputes reſpecting a ſucceſſor ran ſo high, that for three months the papacy was vacant: the clergy eſpouſing the intereſts of one candidate, and the army declaring for another. At length Conon was fixed upon, who proved acceptable to all thoſe in whom the appointment was veſted. He aſcended the pontifical throne in the year 686, and died in about a year, but left behind him a character rarely attained by thoſe who have filled that high ſtation. His piety, learning, integrity, and ſuavity of manners, were exemplary, and juſtly celebrated. There was alſo a cardinal of this name, a native of Germany, and advanced to his high rank in the church by pope Paſcal II. He was the avowed and intrepid defender of the high claims of the Roman ſee, and, on this account, ſelected as a proper perſon to preſide at the council of Jeruſalem, in which Henry V., emperor of Germany, was excommunicated, for not ſubmitting to the pope's aſſumed right to the inveſtiture of biſhops and abbots. He was afterwards legate at the council of Soiſſons, in the year 1121, when the treatiſe of the celebrated Adelard, on the Unity of God, was condemned to be burnt. Conon, it is believed, might have been elected to the popedom on the death of Gelaſius, an honour which he declined for motives not now known. His own vote and intereſt he gave to Guy, archbiſhop of Vienne, who was elected pope, and aſſumed the name Callixtus II. Moreri.

CONONIS Aræ, in *Ancient Geography*, a place of Ethiopia, upon the Arabic gulf, according to Strabo; near port Malin.

CONONITES, in *Eccleſiaſtical Hiſtory*, the followers of Conon of Alexandria in the ſixth century, reſembling in their opinions the Severians, Theodosians, and Tritheists.

CONOPA, in *Ancient Geography*, a lake of Greece, in Etolia, afterwards called *Cygnæa*.—Alſo, a town of Greece, in Acarnania, according to Steph. Byz. and Polybius. Strabo ſays, that the town of Arſinoe, which he places in Etolia, had in former times been called *Conopa*.

CONOPEA, in *Botany*, (κωνωπειον, a veil or net to keep off gnats), Mart. (Conobea; Willd. Juſſ. 97. Aubl. Guian. 2. 639. tab. 257.) Claſs and order, *didynamia angioſpermia*. Nat. Ord. *Lyſimachiæ*, Juſſ.

Gen. Ch. *Cal.* perianth one-leafed, five-angled, permanent, five-cleft; ſegments ſomewhat egg-ſhaped, acuminate, erect. *Cor.* one-petalled, ringent; tube oblong, gradually widening; border two-lipped; upper lip erect, emarginate; lower lip trifid, the middle ſegment larger, concave. *Stam.* filaments four, attached, at the bottom, to the tube of the corolla; anthers arrow-ſhaped. *Piſt.* Germ roundiſh; ſtyle filiform, hairy; ſtigma two-lobed. *Peric.* Capſule roundiſh, one-celled, four-valved. *Seeds* numerous, ſmall, fixed to a roundiſh receptacle.

Eſſ. Ch. Calyx five-cleft. Corolla two-lipped. Capſule one-celled, four-valved, with many ſeeds.

Species. C. *aquatica*, a creeping plant, growing naturally near water, ſpreading over its ſurface, and the graſs near the banks, throwing out ſmall fibrous roots from the joints. *Stems* and branches ſquare, each angle bordered by a very ſharp ring. *Leaves* at each joint, oppoſite, embracing the ſtem, kidney-ſhaped, plaited at the nerves, undulated at the edge. *Flowers* blue, axillary, either ſolitary or in pairs; peduncle an inch long, ſlender; calyx with two long, narrow, pointed leaflets at the baſe. *Capſule* with four grooves, partly encloſed by the calyx. A native of Guiana.

CONOPEUM, in *Antiquity*, a ſort of canopy of network, which hung about beds, and was deſigned to keep away gnats or flies; it comes from κωνωψ, *a fly*. A piece of furniture of this kind is now uſed in the Eaſt; and Mr. Harmer (Obſ. on Scripture, vol. iv. p. 405.) ſuggeſts, that if it obtained there at ſo early a period as the time of Saul, it may ſerve to illuſtrate a paſſage of Scripture, *viz.* 1 Sam. xix. 12—17. This writer ſuppoſes that the word tranſlated "a pillow of goats-hair," meant a conopeum or guard againſt gnats. It is in one place tranſlated a "thick cloth," and in another a "ſieve;" and Harmer obſerves, that a cloth of a nature fit to be uſed as a ſieve, is juſt ſuch a thing as a conopeum, or fine net-work or gauze-like cloth. It appeared to be ſomething "relating to the head;" but a conopeum relates to the head as well as a pillow, being a canopy ſuſpended over the whole bed, or at leaſt ſo far as to ſurround the head, and ſuch upper part of the body as might be uncovered. That this kind of defence againſt gnats is now uſed in the Eaſt, Mr. Harmer has ſhewn, from the teſtimony of Maillet (Deſcript. de l'Egypte, lett. ix. p. 37.). The word occurs probably in the ſame ſenſe in 2 Kings. viii. 15.

CONOPEIUM, in *Ancient Geography*, a marſh of Aſia, near the mouth of the river Halys, according to Arrian.—Alſo, a particular part of the Palus Mæotis. Steph. Byz.

CONOPHORUS, in *Botany*, Petiv. Rai. See **Protea** *Nana*.

CONOPOLI, in *Geography*, a town of European Turkey, in the province of Livadia, 10 miles N.E. of Lepanto.

CONOPS, in *Entomology*, a genus of dipterous inſects, the mouth of which is furniſhed with a projecting geniculate proboſcis, and the antennæ clavated and pointed at the end.

The inſects of this genus are remarkably active, and are found in gardens, where they ſubſiſt on the nectareous juices of flowers; their larvæ are unknown. In the true conops, the head is large and nearly hemiſpherical; the eyes large, and almoſt oval, and the antennæ formed of three articulations, the middle one of which is long and cylindrical, the laſt joint terminating in a little point.

The genus conops is divided in the Linnæan ſyſtem into two families; the firſt of which includes thoſe ſpecies which have the ſheath of the ſucker ſingle-valved, abbreviated, and incloſing a ſingle briſtle; the other thoſe with the ſheath conſiſting of two equal valves, and which is geniculated both at the baſe and in the middle. The latter are the myopæ of Fabricius. In the Fabrician Suppl. Ent. Syſt. the Linnæan conops ſubcoleoptratus is deſcribed under the new genus, thereva.

Species.

* *Firſt Section.*

Vesicularis. Blackiſh; hind head veſicular, abdomen yellow with a black baſe. Fabr. Geoffr. Inhabits woods in Europe.

Macrocephala. Black; four of the abdominal ſegments edged with yellow; antennæ and legs rufous. Linn. Like the laſt inhabits Europe, and is found in woods.

Rufipes. Deep-black; abdomen at the baſe ferruginous; ſegments edged with white; legs ferruginous. Fabr.

This ſpecies is a native of Germany. The rib of the wing, and the antennæ are fuſcous, front and poiſers yellow.

Aculeata. Deep-black; inciſures of the abdomen yellow; thorax with two yellow dots on the anterior part. Linn. Fn. Suec. A native of the northern parts of Europe.

Flavipes. Gloſſy-black; abdomen cylindrical; three of the ſegments edged with yellow. Linn. Fn. Suec. This inhabits Europe, and has the legs faſciated with yellow, whence its name.

Picta. Ferruginous; thorax black, varied with yellow, rib of the wing ferruginous. Fabr.

A native of the American iſlands, deſcribed from the cabinet of Smidt.

Vittata. Abdomen cylindrical, hooked, and varied with ferruginous; an abbreviated ſub-marginal black fillet on the wings. Fabr. Inhabits Kiel.

** *Second Section.*

Ferruginea. Ferruginous; abdomen cylindrical and incurved; front yellowiſh. Linn. *Sicus ferrugineus*, Scop. Inhabits woods of Europe.

Petiolata. Antennæ black, the club red; head yellow; abdomen petiolate. Fabr. A native of Siberia.

Atomaria. Grey; abdomen ovate; wings fuſcous, with crowded dots of white. Gmel. An European ſpecies.

Testacea. Ferruginous; thorax black on the back. Fabr. *Stomoxoides*, Schaffer. Found in Germany.

Atra. Abdomen cylindrical and incurved; body black. Fabr. Inhabits woods of Denmark.

Cincta. Teſtaceous; abdomen hooked and faſciated with white. Fabr. A native of the Eaſt Indies. Koenig.

Buccata. Ferruginous; abdomen hooked, grey; face veſicular and white; wings clouded. Linn. Fn. Suec. *Sicus buccatus*, Scopoli. Inhabits woods of Europe.

Annulata. Thorax black; abdomen cylindrical, varied with yellow and black; baſe of the wings ferruginous; legs ferruginous and annulated with brown. Linn. A native of Europe.

Flava. Thorax black; baſe of the abdomen black on the back, with a black mark each ſide, and the two next ſegments with an oblique black ſpot in the middle and at the ſides. Leſk. An European ſpecies.

Cinerea. Cinereous; mouth veſicular and white; tail black. Fabr. Deſcribed from a ſpecimen in the cabinet of Dr. Allioni. It is a native of Italy.

Dorsalis. Ferruginous; thorax fuſcous on the back; abdomen cylindrical and hooked; margin of the ſegments white. Fabr. *Myopa teſtacea*, Mant. Inſ. Inhabits Germany. Smidt.

CONOPONDIABASSIS, in *Ancient Geography*, a name given by Pliny to an iſland at the mouth of the Danube, which the ancients called *Pſeudoſtoma*.

CONORIA, in *Botany*, Juſſ. 287. (Conori; Lam. Encyc. Conohoria; Aubl. Guian. its name in its native country). Claſs and order, *pentandria monogynia*. Nat Ord. *Berberides*, Juſſ.

Gen. Ch. *Cal.* one-leafed, deeply five-cleft; ſegments lanceolate, acute. *Cor.* Petals five, ovate-oblong, erect, doubled, forming a tube, acute, expanding or reflexed at their ſummit, attached to the receptacle of the piſtil; accompanied by five interior, ſmaller, erect, lanceolate, concave, petal-like bodies placed oppoſite to them. (Nectaries?) *Stam.* Filaments five, very ſhort, attached to the baſe of the petal-like bodies; anthers erect, oblong. *Piſt.* Germ ſuperior, roundiſh; ſtyle ſlender, zig-zag; ſtigma capitate. *Peric.* unknown.

Sp. C. *flaveſcens*. Aubl. Guian. tab. 95. A ſhrub, three or four feet high, with numerous, ſcattered, knotty, compound branches near the top. *Leaves* oppoſite, on ſhort petioles, egg-ſhaped, acute, entire, ſmooth, green above, reddiſh underneath, the largeſt of them ſix inches long, and near three inches broad. *Flowers* yellowiſh, alternate, in ſpikes terminating the branches, and ſurrounded with ſcales at the baſe; peduncles with two, ſmall, oppoſite ſcales about the middle. A native of woods in Guiana.

CONOSPERMUM, in *Botany* (κωνος, a *cone*, and σπέρμα, *ſeed*, from the conical or top-ſhaped figure of the ſeed). Smith Tr. of Linn. Soc. v. 4. 213. Claſs and order, *tetrandria monogynia*. Nat. Ord. *Proteæ*; Juſſ. Shuttlecok ſeed.

Gen. Char. *Cal.* none. *Cor.* monopetalous, ringent, four-cleft; tube ſwelling; upper tip vaulted, undivided; lower, in three equal, ſpreading ſegments. *Stam.* four. Anthers ſeſſile, ſingle-celled, two in the hollow of the upper lip; two, which often ſeem abortive, at the baſe of the lower, remote from each other. *Piſt.* Germen ſuperior, inverſely conical, bearded at the ſummit. Style filiform, bent, ſhorter than the corolla. Stigma obtuſe, curved. *Seed* ſolitary, naked, inverſely conical, its upper edge fringed with numerous, ſpreading, ſhining briſtles, about its own length.

Eſſ. Char. Calyx none. Cor. of one petal, ringent, bearing the ſtamens: its upper lip vaulted; under three-cleft. Stigma obtuſe. Seed one, naked, crowned with briſtles.

Obſerv. Conſidering the irregularity of the flower, and the inequality of poſition of the anthers, perhaps this genus might be placed in *didynamia gymnoſpermia*, in which order it would add one to the very few genera that have leſs than four ſeeds; but it has no affinity to any already claſſed there, being nearly allied to that tribe of *proteæ* whoſe flowers are ſimple, not aggregate: and as the anthers are all really ſeſſile, it could not literally accord with the definition of the 14th claſs.

Sp. 1. C. *longifolium.* Smith Exot. Bot. v. 2. 45. t. 82. "Leaves linear, inclining to obovate, entire, ſmooth, with a marginal nerve, and numerous tranſverſe veins." Sm. *Stem* ſhrubby, rigid, branched, about three feet high, with round leafy branches, which are ſilky when young. *Leaves* alternate, ſeveral inches long, entire, ſmooth, varying in breadth from a linear to a narrow obovate figure, tipped with a ſmall point, and tapering at the baſe, into a longiſh ſlender footſtalk. Their margin is marked with a fine nerve, connected by tranſverſe veins with the midrib. *Stipulas* none. *Flower-ſtalks* about the tops of the branches, axillary, much exceeding the leaves in length, each bearing a large bracteated downy corymbus, of white or bluſh-coloured, ſeſſile, cluſtered flowers. *Bracteas* membranous, wedge-ſhaped, pointed, fringed. *Corolla* about a quarter of an inch long, externally downy. *Seed* inverſely conical, or top-ſhaped, brown, downy, crowned with a marginal row of ſpreading reddiſh briſtles, and altogether reſembling a ſhuttlecock. A native of New South Wales, and other parts of New Holland; not yet brought to Europe. The flowers are ornamental, and the aſpect of the whole ſhrub not inelegant. 2. C. *ellipticum.* "Leaves elliptical, rough, edged." Sm. MSS. A more humble and divaricated ſhrub than the former. *Branches* hairy when young, thickly clothed with *leaves*, which are about three quarters of an inch long, crowded, nearly ſeſſile, elliptical, obtuſe, entire, thick, and apparently ſucculent when freſh, concave when dry, ſingle-ribbed, veinleſs, roughiſh underneath, eſpecially at the edges, tipped with a minute point. *Flower-ſtalks* ſituated as in the foregoing, but ſhorter, and more crowded; very downy, as is likewiſe the outſide of the corolla. *Seed* rather ſmaller than the laſt. Sent from New South Wales by John White, M.D. 3. C. *taxifolium.* "Leaves linear-lanceolate, oblique, ſomewhat downy." Sm. MSS. *Branches* long and wand-like, very leafy, ſilky. *Leaves* imbricated, ſcattered, ſeſſile, nearly an inch long, linear-lanceolate, inclining to obovate, oblique, narrow, rigid, pointed, ſingle-ribbed, veinleſs, thick-edged, entire, for the moſt part clothed with ſhort ſilky hairs, rarely ſmooth. *Flowers* ſituated as in the two ſpecies juſt deſcribed, forming a denſe leafy corymbus at the end of each branch, but their ſtalks are leſs compound. In general aſpect and ſtructure they ſeem, as well as the *ſeeds*, to agree preciſely with thoſe of C. *ellipticum.* Gathered alſo at New South Wales by Dr. White. 4. C. *ericifolium.* "Leaves awl-ſhaped, keeled, ſmooth." Sm. MSS. This has very much the habit of the laſt, and their flowers and ſeeds exactly accord. Both ſeem to be rather herbaceous than ſhrubby, though they have the hard rigid texture ſo frequent in New Holland plants. This is the ſmaller of the two. Its *leaves* are ſcarcely more than half an inch long, imbricated, awl-ſhaped, obtuſe, keeled, and ſomewhat triangular, tipped as in the laſt with a ſmall point, roughiſh occaſionally to the touch, but, as far as we can diſcover, always deſtitute of pubeſcence, though the branches are ſilky. Gathered at New South Wales by Dr. White. 5. C. *reticulatum.* "Leaves wedge-ſhaped, jagged, reticulated on both ſides." Sm. MSS. The *ſtems* appear to be herbaceous and procumbent, leafy, hairy, a few inches in length. *Leaves* about three inches long, alternate, erect, wedge-ſhaped, entire at the ſides, dilated and jagged at the extremity, veiny, beautifully reticulated on both ſides, tapering down at the baſe into rigid, furrowed, hairy footſtalks, about their own length, whoſe baſes are dilated, and bordered with a membranous ſheathing ſtipula. *Flower-ſtalks* terminal, two or three together, hairy, erect, ſcarcely ſo tall as the leaves, each bearing a looſe, bracteated, ſimple ſpike of downy, apparently white, flowers, whoſe ſegments are more obtuſe than in the other ſpecies. The moſt remarkable character of C. *reticulatum* conſiſts in the exquiſitely reticulated veins, prominent on both ſides of the leaf, branching off from the main ribs and veins, and forming a fine regular uniform net-work over the whole ſurface, whoſe interſtices are commonly pentagonal, and not more in diameter than grains of common ſand. The veins themſelves are finely hairy. For dried ſpecimens of this moſt beautiful ſpecies we are indebted to Mr. A. Menzies, who diſcovered it at King George's Sound, on the weſt coaſt of New Holland, lat. 35. Its fruit we have not ſeen, but there can be no doubt of its genus.

CONOSTEIN-*Engers*, or *Engers*, in *Geography*, a town of Germany, in the circle of the Lower Rhine; and electorate of Treves; 4 miles N. of Coblentz.

CONOTHATON, in *Ancient Geography*, an epiſcopal ſee of Aſia, under the metropolis of Boſtra.

CONOU, in *Geography*, a town of Perſia, in the province of Lariſtan, on the coaſt of the Perſian gulf; 66 miles E.S.E. of Lar.

CONOVIUM, in *Ancient Geography*, a town of the iſle of Albion, on the route from Segontium or Caernarvon to Deva or Cheſter, according to Antonine's Itinerary. It was diſtant 24 miles from Caernarvon, and is now called Caer-Rhyn.

CONQUASSATION, in *Pharmacy*, a ſpecies of comminution, or a particular operation, by which moiſt concreted ſubſtances, ſuch as recent vegetables, their fruits, lacteſcent ſeeds, and the ſofter parts of animals, are contuſed and agitated in a mortar, until partly by their proper ſucculence, or the affuſion of ſome liquor, they are reduced to a ſoft pulp. Metalline inſtruments are not to be uſed for this purpoſe, becauſe not only the manifeſt, but alſo the latent ſalts of the ſubſtances, ſubjected to this operation, acting on the inſtruments, may derive an adventitious virulent quality from them, which will not only render ſuch ſubſtances unfit for the intended purpoſes, but alſo nauſeous and hurtful when exhibited as medicines. James.

CONQUEROR, in French *Conquerant.* A captain or commander who has ſubdued ſeveral cities or entire countries by force of arms. Alexander the Great, Julius Cæſar, Tamerlane, Mahomet II., &c. were conquerors.

CONQUES, in *Geography*, a ſmall town of France, in the department of Aude, and chief place of a canton in the diſtrict of Carcaſſonne, with a population of 1591 inhabitants. That of the canton amounts to 5635, in 10 communes, upon an extent of one hundred kiliometres.—Alſo, a ſmall town of France, in the department of Aveyron, in the diſtrict of Rhodez, with 806 inhabitants, 15 miles N. from Rhodez. The canton, of which it is the chief place, has 12 communes, with 6597 inhabitants, and meaſures 187 kiliometres and a half.

CONQUEST, in French *Conquete*, the acquiſition of a place, province, or entire country, by a ſuperiority of arms, which compels the conquered to ſubmit to the conqueror.

CONQUEST, in *Civil Juriſprudence*, is the acquiſition of property in common by a number of perſons.

In ſome countries, they confound acquiſition with *conqueſt*; but, according to the moſt general acceptation, acquiſition is the gaining of unappropriated goods before the eſtabliſhment of a community; whereas, by the term *conqueſt*, is ordinarily intended whatever is acquired by a number of perſons in community; or by ſome one for all the others.

As it is more eſpecially in the union of perſons by marriage, that a community of property takes place; it is in reference to them that we frequently uſe the word *conqueſt*. There are, nevertheleſs, conqueſts alſo among other perſons who are in a tacit community or ſociety; ſuch as obtain by particular local cuſtoms.

According to this ſenſe of the word, it has been contended by ſeveral, that William I. claimed this kingdom; that is, not by right of arms, but by right of conqueſt or acqueſt; under promiſe of ſucceſſion made by Edward the Confeſſor, and a contract entered into by Harold, to ſupport his pretenſions to that ſucceſſion; and by old writers, conqueſtus, acquiſitio, and perquiſitio, are frequently uſed as ſynonymous terms.

In conſequence of the prodigious ſlaughter of the Engliſh nobility at the battle of Haſtings, and the fruitleſs inſurrections of thoſe who ſurvived, ſuch numerous forfeitures had accrued, that king William was able to reward his Norman followers with very large and extenſive poſſeſſions; which circumſtance led the monkiſh hiſtorians, and ſuch as have implicitly followed them, to repreſent him as having, by right of the ſword, ſeiſed on all the lands of England, and diſtributed them among his own favourites. This ſuppoſition is grounded upon a miſtaken ſenſe of the word "conqueſt," which, in its feodal acceptation, ſignifies no more than "acquiſition;" and hence many party writers have been led into a ſtrange hiſtorical miſtake, and one, ſays judge Blackſtone, which upon the ſlighteſt examination, will be found to be moſt untrue. See Feodal *Tenure*.

What we call "purchaſe," *perquiſitio*, the feudiſts called "conqueſt," *conqueſtus*, or *conquiſitio*; both denoting any means of acquiring an eſtate out of the common courſe of inheritance. This is ſtill the proper phraſe in the law of Scotland; as it was among the Norman juriſts, who ſtyled the firſt purchaſer (that is, the perſon who brought the eſtate into the family, which at preſent owns it) the conqueror or *conquereur*. This is all that ſeems to have been meant by the appellation that was given to William the Norman, when his manner of aſcending the throne of England was in his own charter, and in thoſe of his ſucceſſors, and alſo by the hiſtorians of the times, entitled *conqueſtus*, and himſelf *conqueſtor* or *conquiſitor*; ſignifying that he was the firſt of his family who acquired the crown of England, and from whom, therefore, all future claims by deſcent muſt be derived; though now, from our diſuſe of the feodal ſenſe of the word, together with the reflection on his forcible method of acquiſition, we are apt to annex the idea of "victory" to this name of "conqueſt," or "conquiſitum," a title which, however juſt with regard to the *crown*, the conqueror never pretended with regard to the *realm* of England; nor, in fact, ever had. See Purchase.

William the Norman, as we have already obſerved, and as ſome have maintained, claimed the crown by virtue of a pretended grant from king Edward the Confeſſor; a grant which, if real, was in itſelf utterly invalid; becauſe it was made, as Harold well obſerved, in his reply to William's demand, *abſque generali ſenatus, et populi conventu et edicto*; and this alſo very plainly implies, that it was then generally underſtood, that the king, with conſent of the general council, might diſpoſe of the crown and change the line of ſucceſſion. William's title, however, was altogether as good as Harold's, who was a mere private ſubject, and an utter ſtranger to the royal blood. The conqueſt, then, by William of Normandy, was, like that of Canute before, a forcible transfer of the crown of England into a new family; but, the crown being ſo transferred, all the inherent properties of the crown were alſo transferred with it. For, the victory obtained at Haſtings not being a victory over the nation collectively, but only over the perſon of Harold, the only right which the conqueror could pretend to acquire thereby, was the right to poſſeſs the crown of England, not to alter the nature of the government. And, therefore, as the Engliſh laws ſtill remained in force, he muſt neceſſarily take the crown ſubject to thoſe laws, and with all its inherent properties; the firſt and principal of which was its deſcendibility. See *Right of* Crown.

Some writers have repreſented William's conqueſt as more extenſive and complete than it has been above ſtated. Scarcely any of thoſe revolutions, it is ſaid, which, both in hiſtory and in common language, have been always denominated conqueſts, appear equally violent, or were attended with ſo ſudden an alteration of power and property. The Roman ſtate, which ſpread its dominion over Europe, left the rights of individuals in a great meaſure untouched; and thoſe civilized conquerors, while they made their own country the ſeat of empire, found that they could derive the greateſt advantage from the ſubjected provinces, by ſecuring to the natives the free enjoyment of their own laws, and of their private poſſeſſions. The barbarians who ſubdued the Roman empire, though they ſettled in the conquered countries, yet being accuſtomed to a rude uncultivated life, found a part only of the land ſufficient to ſupply all their wants; and they were not tempted to ſeize extenſive poſſeſſions, which they knew how neither to cultivate nor to enjoy. But the Normans and other foreigners, who followed the ſtandard of William, were ſo far advanced in the arts as to know the value of a large property; and therefore having made the vanquiſhed kingdom the ſeat of government, and having totally ſubdued the natives, they puſhed the rights of conqueſt, for the gratification both of their avarice and ambition, to the utmoſt extremity. Except the former conqueſt of England by the Saxons themſelves, who were induced, by peculiar circumſtances, to proceed even to the extermination of the natives, it would be difficult to find, in all hiſtory, a revolution more deſtructive, or attended with a more complete ſubjection of the ancient inhabitants. In the conduct of their conquerors, contumely was blended with oppreſſion; and the natives were univerſally reduced to ſuch a ſtate of meanneſs and poverty, that the Engliſh name became a term of reproach, and ſeveral generations elapſed before one family of Saxon pedigree was raiſed to any conſiderable honours, or could ſo much as attain the rank of baron of the realm. "Theſe facts," ſays Mr. Hume (Hiſt. vol. i. p. 283, 8vo.) "are ſo apparent from the whole tenor of the Engliſh hiſtory, that none would have been tempted to deny or elude them, were they not heated by the controverſies of faction; while one party was *abſurdly* afraid of thoſe *abſurd* conſequences, which they ſaw the other party inclined to draw from this event. But it is evident that the preſent rights and privileges of the people, who are a mixture of Engliſh and Normans, can never be affected by a tranſaction which paſſed 700 years ago; and as all ancient authors, who lived neareſt the time, and beſt knew the ſtate of the country, unanimouſly ſpeak of the Norman dominion as a conqueſt by war and arms, no reaſonable man, from the fear of imaginary conſequences, will even be tempted to reject their concurring and united teſtimony."

The Norman invaſion, and conqueſt, as it has been uſually denominated, were important events in the hiſtory of this country; and produced as great an alteration in our laws, as it did in our ancient line of kings:—and though the alteration of the former was effected rather by the conſent of the people, than by any right of conqueſt, yet that conſent ſeems to have been partly extorted by fear, and partly given without any apprehenſion of the conſequences which afterwards enſued. The alterations in our laws which then took place are enumerated by judge Blackſtone; and we ſhall here ſubjoin a ſummary of them. The *firſt* of theſe was the ſeparation of the eccleſiaſtical courts from the civil, which was effected in order to ingratiate the new king with the popiſh clergy, who had been for ſome time endeavouring, in every part of Europe, to exempt themſelves from the ſecular power. This was the more eaſily accompliſhed, becauſe, the diſpoſal of all the epiſcopal ſees being then in the breaſt of the king, he had taken care to fill them with Italian and Norman prelates. The *ſecond* alteration of the Engliſh conſtitution was more violent, and conſiſted in the depopulation of whole countries, for the purpoſes of the king's royal diverſion; and ſubjecting both them, and all the ancient foreſts of the kingdom, to the unreaſonable ſeverities of foreſt laws imported from the continent, by which the ſlaughter of a beaſt was made almoſt as penal as the death of a man. (See Forest and Game.) A *third* alteration in the Engliſh law was effected by narrowing the remedial influence of the county courts, the great ſeats of Saxon juſtice, and extending the *original* juriſdiction of all the king's juſticiars to all kinds of cauſes ariſing in all parts of the kingdom. (See Aula *regia*.) Hence all proceedings in the king's courts were ordained to be carried on in the Norman, inſtead of the Engliſh language; a badge of ſlavery as evident and ſignal as ever was impoſed upon a conquered people, which laſted till king Edward III. obtained a double victory, over the armies of France in their own country, and their language in our courts here at home. A *fourth* innovation was the introduction of the trial by combat, for the deciſion of all civil and criminal queſtions of fact in the laſt reſort. (See Combat.) The *laſt* and moſt important alteration, both in our civil and military polity, was the engrafting on all landed eſtates, a few only excepted, the fiction of feodal tenure; which drew after it a numerous and oppreſſive train of ſervile fruits and appendages; aids, reliefs, primer ſeiſins, wardſhips, marriages, eſcheats, and fines for alienation; the genuine conſequences of the maxim then adopted, that all the lands in England were derived from, and holden, mediately or immediately, of, the crown. See each article reſpectively, and Feodal *Tenure*.

"The nation at this period," ſays judge Blackſtone, "ſeems to have groaned under as abſolute a ſlavery as was in the power of a warlike, an ambitious, and a politic prince to create. The conſciences of men were enſlaved by four eccleſiaſtics, devoted to a foreign power, and unconnected with the civil ſtate under which they lived:—who now imported from Rome for the firſt time the whole *farrago* of ſuperſtitious novelties, which had been engendered by the blindneſs and corruption of the times, between the firſt miſſion of Auguſtin the monk, and the Norman conqueſt; ſuch as tranſubſtantiation, purgatory, communion in one kind, and the worſhip of ſaints and images; not forgetting the univerſal ſupremacy and dogmatical infallibility of the holy ſee. The laws too, as well as the prayers, were adminiſtered in an unknown tongue. The ancient trial by jury gave way to the impious deciſion by battle. The foreſt laws totally reſtrained all rural pleaſures and manly recreations. And in cities and towns the caſe was no better; all company being obliged to diſperſe, and fire and candle to be extinguiſhed by eight at night, at the ſound of the melancholy *curfew*. The ultimate property of all lands, and a conſiderable ſhare of the preſent profits, were veſted in the king, or by him granted to his Norman favourites; who, by a gradual progreſſion of ſlavery, were abſolute vaſſals to the crown, and as abſolute tyrants to the commons. Unheard of forfeitures, talliages, aids, and fines, were arbitrarily exacted from the pillaged landholders, in purſuance of the new ſyſtem of tenure. And to crown all, as a conſequence of the tenure by knight-ſervice, the king had always ready at his command an army of 60,000 knights, or *milites*; who were bound, upon pain of confiſcating their eſtates, to attend him in time of invaſion, or to quell any domeſtic inſurrection. Trade, or foreign merchandize, ſuch as it then was, was carried on by the Jews and Lombards; and the very name of an Engliſh fleet, which king Edgar had rendered ſo formidable, was utterly unknown to Europe; the nation conſiſting wholly of the clergy, who were alſo the lawyers; the barons, or great lords of the land; the knights, or ſoldiery, who were the ſubordinate land-holders; and the burghers, or inferior tradeſmen, who from their inſignificancy happily retained, in their ſocage and burgage tenure, ſome points of their ancient freedom. All the reſt were villeins or bondmen."

"From ſo complete and well-concerted a ſcheme of ſervility, it has been the work of generations for our anceſtors, to redeem themſelves and their poſterity into that ſtate of liberty, which we now enjoy:—and which therefore is not to be looked upon as conſiſting of mere encroachments on the crown, and infringements on the prerogative, as ſome ſlaviſh and narrow-minded writers in the laſt century endeavoured to maintain:—but as, in general, a gradual reſtoration of that ancient conſtitution, whereof our Saxon forefathers had been unjuſtly deprived, partly by the policy, and partly by the force, of the Norman." Blackſt. Com. Book iv. See Constitution.

Conquest, in the *Law of Nations*, is the acquiſition of ſovereignty by force of arms, by ſome foreign prince; who reduces the vanquiſhed under his empire. The right of conqueſt is derived from the laws of war; and when a people is ſubjected, the conduct of the conqueror is regulated by four kinds of law. Firſt, the law of nature, which dictates whatever tends to ſelf-preſervation; ſecondly, our reaſon, which teaches us to uſe others, as we would be treated ourſelves; thirdly, the laws of political ſociety, to which nature has not aſſigned any preciſe boundary; laſtly, the law which is derived from the particular circumſtances attending the conqueſt. Thus, a ſtate conquered by another will be treated in one of the four methods following: Either the conqueror will continue it under its own laws, and will only claim the exerciſe of civil and eccleſiaſtical ſovereignty; or he will impoſe a new form of government; or he will deſtroy the frame of their ſociety, and incorporate the inhabitants with others; or he will exterminate them. Ancient and modern hiſtory will ſupply numerous inſtances of theſe different modes of treatment. See Colony and Plantation.

The right of conqueſt is allowed by the law of nations, if not by that of nature; but in reaſon and civil policy it can mean nothing more than that, in order to terminate hoſtilities, a compact is either expreſsly or tacitly made between the conqueror and the conquered, that if they will acknowledge the victor for their maſter, he will treat them for the future as ſubjects, and not as enemies. *Puffend.* Ls. of Nat. viii. b. 24.

CONQUET, Le, in *Geography*, a pretty, rich, ſmall town of France, in the department of Finiſtere, with a good harbour, and excellent roads; 15 miles weſt from Breſt. It is one of the 84 maritime quarters into which modern France is divided, and the reſidence of a maritime ſyndic who ſuperintends this place, beſides Argenton, Lorſpoder, and Oueſſant.

CONQUISITORES. Among the Romans, theſe were commiſſaries or commiſſioners, charged by their functions with the raiſing of troops in the towns, and throughout the country; and obliged, at the ſame time, to make ſearch for thoſe who wiſhed or attempted to withdraw themſelves from the levy.

CONRAD, or Coenrads, Abraham, in *Biography*, an engraver and deſigner of Holland, who was born about 1620. The works of this artiſt, for the greater part, conſiſt of portraits, many of which are from his own drawings, and prove him to have poſſeſſed very conſiderable talents. His ſtyle of engraving is much varied in his different works: ſome of his prints very much reſemble thoſe of L. Voſtermans. Amongſt his beſt works the following may be enumerated: "Chriſtopher Love," *A. Conrad fec.* in fol.; "Jacob Triglande, Profeſſor of Theology to the Univerſity of Leyden," *Ab. Conradus fecit*, in fol.; "The Flagellation and the Crucifixion of Chriſt," two plates in folio, from Ab. Van Diepenbeck. Huber, Manuel des Arts.

Conrad I., emperor of Germany, was, previouſly to his attaining that high honour, duke of Franconia and Heſſe. On the death of Louis IV. king of Germany, A. D. 912, the nobility of the realm aſſembled at Worms, for the purpoſe of chooſing a ſucceſſor. They offered the crown to Otho, duke of Saxony, by whom, on account of his great age, it was not accepted. He requeſted them to turn their thoughts to the duke of Franconia, who was highly eſteemed for his great talents and excellent character. Upon this recommendation he was called to the vacant throne, though not with that unanimity which is calculated to ſecure general homage. The people of Lorrain were attached to Charles the Simple, whom they wiſhed to proclaim as their ſovereign: Conrad marched thither with great expedition, and by his preſence conciliated thoſe who were diſpoſed to reſiſt his authority. While he was thus engaged, Henry, duke of Saxony, ſon of Otho, joined by the dukes of Suabia and Bavaria, excited a rebellion. This, after ſurmounting ſeveral difficulties, he cruſhed, and gained a complete victory over his enemies. The Hungarians now made a dreadful irruption into his dominions, and, after marking their progreſs with fire and ſword, compelled him to purchaſe a peace on very diſgraceful terms: but, notwithſtanding all the exertions of his enemies, he retained the ſceptre, and conducted the affairs of the empire with conſiderable prudence till the time of his death. His conſtitution being broken by the fatigues to which he had been expoſed, and his health being much injured in conſequence of a wound which he had received in battle, he aſſembled the princes and ſtates of the empire, and ſeriouſly exhorted them to raiſe Henry, duke of Saxony, who had been his enemy, to the imperial throne. This is a rare inſtance, on the records of hiſtory, of a prince ſacrificing his private reſentment to the public good. He ſent the crown, ſceptre, and other regalia to his intended ſucceſſor; and after an active and reſpectable reign of ſeven years, he died, A. D. 918, in peace, with the conſciouſneſs of quitting life under the influence of Chriſtian principles.

Conrad II., emperor of Germany, was likewiſe duke of Franconia; he was ſurnamed The Salic, on account of his having been born on the banks of the river Sala, and was unanimouſly inveſted with ſupreme authority. He ſucceeded Henry II., and was crowned, according to ancient uſage, at Thonza. During the firſt two years of his reign, Conrad was chiefly employed in regulating the police, and other affairs of adminiſtration; but in the third, receiving intelligence that the Lombards had ſhaken off their allegiance, he was obliged to march into Italy. The rebels were ſoon reduced to obedience, and the king proceeded to Rome, where he was ſolemnly crowned by pope John, in preſence of Canute, king of England and Denmark, and Rodolphus, king of Burgundy. He was recalled to Germany, on account of an inſurrection, raiſed by the dukes of Suabia, Carinthia, and Worms, which he readily ſuppreſſed, and brought the offenders to the loweſt ſtate of ſubjection. By a decree of the empire, they were deprived of their dominions. The ſeven ſucceeding years were occupied by wars between the emperor, Poland, Bohemia, and Hungary: the detail of theſe would be unintereſting to our readers. The imperial arms were in general ſucceſsful; and on the demiſe of Rodolphus, Conrad acquired the peaceable poſſeſſion of the ſovereignty of Burgundy. A general revolt againſt the German dominions was planned in Italy, and fomented by many leading perſons: the emperor paſſed ſuddenly into that country, and ſeizing ſome of the principal malcontents, ſent them priſoners to Germany. He beſieged Milan, but without ſucceſs; and ſeverely chaſtiſed Parma. Being urged by the monks of Caſſino to protect them againſt the violence and oppreſſion of Pandulph, prince of Capua, he marched to that place, expelled the prince, and ſeized his country. Returning to Germany, he was ſeized with the gout in his legs, and died ſuddenly at Utrecht, in 1039, in the fifteenth year of his reign. He was univerſally revered as a juſt and magnanimous prince; and all thoſe who diſtinguiſhed themſelves in his ſervice had no reaſon to be diſſatisfied with the remunerations which they obtained. Among many inſtances of his munificence, it is ſaid that one of his attendants, who had loſt his leg in battle, received his boot-full of gold, which the emperor obſerved might defray the expence of his cure. He was interred in the cathedral church of Spires, which he had formerly founded and endowed.

Conrad III., another duke of Franconia and emperor of Germany, was nephew of the emperor Henry V., and elected to the imperial throne at Coblentz in 1138-9, as ſucceſſor to Lothaire II. This meaſure was warmly conteſted by Henry, duke of Bavaria, who poſitively refuſed to ſurrender the regalia, which had been depoſited in his hands by Lotharius. He was, however, at length compelled to ſubmit, with the loſs of his own dominions; and the diſappointment and chagrine which he ſuffered on the occaſion brought him to an early grave. Upon the death of this prince, his brother Guelph, with the aſſiſtance of the king of Sicily, made vigorous exertions for the recovery of the confiſcated duchies: a war enſued, and, after ſeveral indeciſive engagements, the duke was cloſely beſieged by the emperor in the caſtle of Weinſberg, celebrated for the conjugal fidelity and affection of the ladies; who, being permitted to leave the place with whatever they could carry, marched out, each with her huſband on her back. This inſtance of kindneſs and regard ſo much affected the emperor, that he readily came into terms with Guelph and his partizans. In this war we muſt look for the origin of the deſignations of the Guelphs and Ghibellines, which are ſo often referred to on the page of hiſtory. The troubles in Germany were immediately ſucceeded by a revolt of ſeveral of the towns of Italy, which threw off the ſovereignty of the empire, and formed themſelves into independant republics. Conrad was now prevailed on to join a cruſade againſt the Saracens, and took the croſs from the hands of Bernard. He accordingly ſet out for Paleſtine, at the head of ſixty thouſand men. Under his banners a troop of females rode in the attitude and armour of men; and the chief of theſe Amazons, from her gilt ſpurs and buſkins, obtained the epithet of the "golden-footed dame." This expedition proved unfortunate: one half of his troops periſhed by ſickneſs, occaſioned, it is believed, through unwholeſome proviſions, furniſhed by the treachery of the Greek emperor, Manuel Comnenus. Conrad, with the remainder, joined Louis VII. king of France, in the ſiege of Damaſcus, exhibiting great prowefs, but without any ſucceſs. The ſiege was raiſed, and the emperor returned to Germany, where he was overwhelmed with public calamity and private affliction, by another revolt of Guelph, and by the death of his eldeſt ſon. This laſt event preyed on his mind, and evidently affected his health. Aware of his approaching end, he was anxious to provide for the ſucceſſion, and recommended his nephew, Frederic Barbaroſſa, to the ſtates of the empire, as a prince of known courage and tried talents. His recommendation was approved, and Conrad died in a ſhort time after, at Bamberg, in the 14th year of his reign. He left one ſon by his empreſs Gertrude, whoſe tender age precluded him from taking any ſhare in the government.

CONRAD IV., the laſt emperor of Germany of this name, was duke of Suabia, and ſon of the emperor Frederick II. He was declared ſucceſſor to his father in 1250, but pope Innocent IV. refuſed to confirm the election. Conrad, notwithſtanding the denunciations of the pontiff, marched into Italy, in order to take poſſeſſion of the kingdom of the two Sicilies, which had been bequeathed to him by his father. He took the city of Naples after an eight months' ſiege: afterwards Capua and Aquino opened their gates to him. He did not long enjoy his ſucceſs: in 1254, he fell ſick, and died in the flower of youth, leaving one ſon, named Conradin, who, at the early age of fourteen, was beheaded by the orders of Charles of Anjou; and in him ended the line of Suabia. Moreri. Univer. Hiſt. Gibbon's Rom. Empire.

CONRAD is a name diſtinguiſhed in literary hiſtory, as well as among the princes of the earth; but as none of that appellation have become very illuſtrious by their works, we ſhall briefly notice them and their writings in a ſingle paragraph. The firſt was a German abbot of the Benedictine order, about the commencement of the tenth century: he wrote "A Continuation of the Hiſtory of France;" and on that account has, by ſome biographical writers, been ſuppoſed a Frenchman; by others, he has been confounded with Conrad of Cologne, who was author of the life of S. Wolphemius. Towards the concluſion of the eleventh century, *Conrad*, biſhop of Utrecht, flouriſhed, to which office he had been raiſed by his pupil, the emperor Henry. He is chiefly known by a work, entitled, "Apologia de Unitate Eccleſiæ conſervanda, et Schiſmate inter Henricum IV. Imp. ac Greg. VIII. Pont. Max." He wrote alſo a ſpirited defence of the imperial right on the ſubject of inveſtitures. The biſhop was aſſaſſinated in his palace, A. D. 1099, by a Frieſland architect, in revenge for having inſtructed him in the method of erecting maſſy buildings on a ſwampy ſoil, and afterwards employing a rival in conſtructing the collegiate church of which the biſhop was founder.—*Conrad* of Sheurn, a German monk, lived in the thirteenth century, and was author of "A Chronicle," and of more than fifty volumes on different ſubjects, chiefly hiſtorical, of which John of Aventine made much uſe in compoſing part of his annals. By his various writings, this monk obtained the honourable epithet of "philoſopher."—*Conrad* of Lichtenau, abbot of Urſberg, in the thirteenth century, was author of "A chronological Hiſtory," extending from Belus, king of Aſſyria, to the year 1449, which was afterwards continued, by an anonymous writer, to the reign of Charles V. It was originally printed at Straſburg, in 1537, and afterwards, with the continuation, in 1569, at Baſil. It created enemies, by ſome reflections on the wars carried on between the German emperors and the popes. The ſame author is ſaid to have written the lives of the ſaints, in 12 books; but they have not come down to us, and probably were never publiſhed.—*Conrad* of Mentz flouriſhed in the thirteenth century, and is known by a work, entitled, "Chronicum Rerum Moguntiarum," from the year 1140 to 1250, which was firſt publiſhed in 1535, and has undergone ſeveral different impreſſions.—About the ſame period lived *Conrad* of Marpurg, who was the firſt perſon of Germany that received the infamous commiſſion of inquiſitor from the papal ſee; an office which he executed with ſo much cruelty, that at length he fell a ſacrifice to the indignation of popular clamour. He wrote "The Life of the Princeſs Elizabeth of Thuringia," who has obtained a place among the ſaints.—*Conrad* is the name of two Dominican monks, natives of Saxony, in the fourteenth century. One was a member of the chapter of his order in that province, and the other appointed by the pope vicar-general of Saxony, in the year 1350. The former publiſhed, among many other things, "A Commentary on the Book of Job;" "A Concordance to the Bible;" "The Student's Dream;" and "A common-place Book for the Uſe of Preachers."—*Conrad* of Aſti, a Piedmonteſe Dominican monk, was author of "Commentaria in Jus Canonicum," and other pieces. He died in the year 1470.—In the ſixteenth century appeared *Conrad Leontinus*, a learned German Ciſtertian monk, who appears to have been well acquainted with the beſt writers in profane and ſacred literature, and to have maintained an intimate correſpondence with the moſt learned men of his time. He publiſhed, in the year 1507, at Baſil, "Nicholas de Lyra's Commentary on the Bible, with marginal Notes."—There were ſeveral others of this name, but it is needleſs to mention them all. *Conrad* of Mur, canon of the church of Zurich, lived in the thirteenth century, and is known for his treatiſe on the ſacraments, and the lives of the popes: and *Conrad* of Saxony wrote "A Chronicle," and ſome hiſtorical works, to which no date is aſſigned. Moreri.

CONRI, FLORENCE, a Franciſcan friar, was born in the province of Connaught, about the year 1560, and was ſent at an early age into Spain, as a ſtudent in theology and the philoſophy of the times. When he had finiſhed his ſtudies, he travelled into the Low Countries, where he acquired great reputation among the Catholics, by his aſſiduity and zeal in illuſtrating and defending the doctrines of St. Auguſtine. He was author of ſeveral tracts on theological ſubjects, among which were "The Mirror of the Chriſtian Life;" an "Iriſh Catechiſm," printed at Louvain, in 1626; and "Tractatus de Statu parvulorum ſine Baptiſmo decedentium ex hac Vita," Lovanii, 1624. As a politician, he was fixed on to conciliate his countrymen to the meaſures of the court of Spain, when Philip III. attempted the conqueſt of Ireland, during the reign of Elizabeth. On the failure of that enterprize he eſcaped from the country, and ſpent the remainder of his life in the Low Countries, and at Madrid, ſupported by a penſion from Spain, in recompence for the ſervices which he intended, but which proved ineffectual. He died at Madrid, in the year 1629. Moreri.

CONRINGIUS, Herman, a philoſopher of great talents, and almoſt univerſal learning, born at Norden in Eaſt Frieſland in November, 1606, received his education at Helmſtadt, where he was made doctor in medicine in 1636, and ſoon after advanced to the chair of profeſſor in that ſcience. He was alſo, in ſucceſſion, appointed profeſſor in phyſics, law, and politics. For his profound knowledge in the laws of nations and politics, he was conſulted, and made phyſician and aulic counſellor to Chriſtina, queen of Sweden, to the king of Denmark, and to ſeveral of the German princes and electors. Of his capacity for theſe employments abundant proof may be found in his numerous works in philoſophy, medicine, and hiſtory, which were long held in great repute, though now referred to rather from curioſity than for their utility. In all of them, however, there is a wonderful diſplay of learning. In his philoſophy he was a follower of the ſchool of Ariſtotle, as he proclaims in the firſt of his publications, *viz.* "De Calido innato, de Morte, et Vita, et de Origine Formarum, libri, omnia ad Ariſtotelis Sententiam elaborata," Lug. Bat. 1631, 8vo., republiſhed with additions in 1640, 43, and 46; "De Germanicorum Corporum Habitûs antiqui et novi Cauſis, Diſſertatio," Helmſt. 1645, 4to. This has been frequently reprinted. The author has ſome ingenious conjectures on the cauſes of the diminiſhed ſtature, and altered complexion, and habit of body, of the Germans, which he ſhews from indiſputable documents had taken place among theſe people. The ancient Germans were fair, with blue eyes, and abundant yellow hair, "robuſtis nato parentibus, ſero veneri ſe dediſſe, inque conjugio caſtos vixiſſe, et ſuas vires conſervaſſe integriores, et pleniores filiis impretiiſſe, &c. &c. An entire change in their mode of living, the uſe of ſtoves, of tobacco, &c. he conceives to have gradually undermined their conſtitutions, and to have produced the changes he ſtates to have taken place. An edition of this work was printed at Francfort, with notes, by Philip Burgſhaw, 8vo. 1727. "De Hermetica Ægyptiorum vetere, et Paracelſica nova Medicina," Helmſt. 1648, 4to.; reprinted, with additions, 1669: a work abounding with ingenious and learned ſpeculations, but little now attended to. "Introductio in univerſam Artem Medicam, ejuſque ſingulas Partes," 1654; re-edited by Schelhammer, 1687; and again by Hoffman, 1726, 4to.; containing an hiſtory and bib. medica, with obſervations on the principal ſects and writers in medicine, beſides numerous diſſertations on particular diſeaſes, as dropſy, pleuriſy, &c. Conringius is ſaid to have been remarkably diminutive in ſtature, but of great vivacity, and enjoying a ſtrong memory. He retained the ſituation of ſenior of the univerſity of Helmſtadt to the time of his death, which happened on the 12th of December, 1681. His character is contained in the following epitaph:

Hoc tumulo
Clauditur regum principumque conſiliarius,
Juris naturalis gentium publici doctor,
Philoſophiæ omnis peritiſſimus, practicæ et theoreticæ,
Philologus inſignis, orator, poeta, hiſtoricus, medicus,
Theologus,
Multas putas his conditas.
Unus eſt Hermannus Conringius, ſæculi miraculum,
Poſuit Henricus Meibomius.

Haller Bib. Eloy Dict. Hiſt.

CONSABURUS, in *Ancient Geography*, a town of Spain, towards the ſouth-weſt of Althæa Olcadum.

CONSANGUINEO, Writ de, in *Law*. See Assise *de Mort d'Anceſtor*.

CONSANGUINEUS Frater. See Consanguinity.

CONSANGUINITY, the relation of kinſhip, between perſons of the ſame blood, or ſprung from the ſame root; or, as it is defined by writers on theſe ſubjects, "*Vinculum perſonarum ab eadem ſtipite deſcendentium*;" *i. e.* the connection or relation of perſons deſcended from the ſame ſtock or common anceſtor. This conſanguinity is either *lineal*, when it ſubſiſts between perſons, of whom one is deſcended in a direct line from the other; as between A. B. and his father, grandfather, great grandfather, and ſo upwards in the direct aſcending line; or between A. B. and his ſon, grandſon, great grandſon, and ſo downwards in the direct deſcending line. Every generation, in this lineal direct conſanguinity, conſtitutes a different degree, reckoning either upwards or downwards: thus, the father of A. B. is related to him in the firſt degree, and ſo likewiſe is his ſon; his grandſire and grandſon in the ſecond; his great grandſire and great grandſon in the third. This is the only natural way of reckoning the degrees in the direct line, and therefore univerſally obtains, as well in the civil and canon, as in the common, law. Conſanguinity is *collateral*, when relations deſcend from the ſame ſtock or anceſtor, but do not deſcend one from the other. See Collateral.

It is eaſy to compute, by the rules of progreſſion, how many lineal anceſtors any man has within a certain number of degrees. Thus, it would appear that a perſon, at the 20th degree, or the diſtance of 20 generations, hath above a million of anceſtors: and if a ſimilar calculation be made of collateral kindred at the diſtance of 20 degrees forward, on the ſuppoſition that each couple of anceſtors leave, one with another, two children, the number will be 274877906944: as in the following tables:

Table I.

Lineal Degrees.	Number of Anceſtors.
1	2
2	4
3	8
4	16
5	32
6	64
7	128
8	256
9	512
10	1024
11	2048
12	4096
13	8192
14	16384
15	32768
16	65536
17	131072
18	262144
19	524288
20	1048576

In forming this table, it is evident that each perſon has two anceſtors in the firſt degree, and that the number is doubled at every remove, becauſe each of his anceſtors has alſo two immediate anceſtors of his own. In order to find the number of anceſtors at any particular degree, we need only to find a power of 2, the index of which is the number of degrees; *e. g.* $\overline{2}|^{5}$, $\overline{2}|^{10}$, $\overline{2}|^{15}$, &c. will give the correſponding number reſpectively. Or, the number of anceſtors at any even degree may be had by ſquaring the number of anceſtors at half that number of degrees: thus 16, the number of anceſtors at 4 degrees, is the ſquare of 4, the number of anceſtors at two; 256 is the ſquare of 16; 65536 of 256; and the number of anceſtors at 40 degrees would be the ſquare of 1048576, or upwards of a million of millions. Theſe powers are eaſily found by means of logarithms. See PROGRESSION.

TABLE II.

Collateral Degrees.	Number of Kindred.
1	1
2	4
3	16
4	64
5	256
6	1024
7	4096
8	16384
9	65536
10	262144
11	1048576
12	4194304
13	16777216
14	67108864
15	268435456
16	1073741824
17	4294967296
18	17179869184
19	68719476736
20	274877906944

It is obvious that in this table the numbers in the progreſſion increaſe much more rapidly than thoſe of the former table; for though the firſt born is 1, the ratio of the progreſſion is 4; that is, there is one kinſman (a brother) in the firſt degree, who makes, together with A. B., the *propoſitus*, as he is called, the two deſcendants from the firſt couple of anceſtors; and in every other degree, the number of kindred muſt be *quadruple* of thoſe in the degree which immediately precedes it. For, ſince each couple of anceſtors has two deſcendants, who increaſe in a duplicate ratio, it will follow that the ratio in which all the deſcendants increaſe downwards, muſt be double that in which the anceſtors increaſe upwards; but the anceſtors increaſe upwards in a duplicate ratio; therefore the deſcendants muſt increaſe downwards in a double duplicate; that is, in a quadruple ratio. This calculation may be formed by a more compendious proceſs, *viz.* by ſquaring the couples, or half the number of anceſtors at any given degree, which will furniſh the number of kindred we have in the ſame degree, at equal diſtance with ourſelves from the common ſtock, beſides thoſe at unequal diſtances. Thus, in the 10th lineal degree, the number of anceſtors is 1024; its half, or the couples, amount to 512; the number of kindred in the 10th collateral degree amounts, therefore, to 262144, or the ſquare of 512. Or, it will be ſeen in the table that $\overline{4}|^{3} = 64$, the number of kindred in the 4th collateral degree; $\overline{4}|^{4} = 256$, the number in the 5th degree; $\overline{4}|^{6} = 1024$, the number in the 6th degree, &c. and therefore if the number of degrees be denoted by n, $\overline{4}|^{n-1}$, will be the number of kindred in the degree expreſſed by n; which is eaſily obtained by the aid of logarithms in any degree, however remote. If any one will be at the trouble of recollecting the ſtate of the ſeveral families within his own knowledge, and of obſerving how far they agree with this account; that is, whether, on an average, every man has not one brother or ſiſter, four firſt couſins, ſixteen ſecond couſins, and ſo on; he will find that the preſent calculation is very far from being overcharged.

From the records of ſcripture we learn, that there is one couple of anceſtors belonging in common to us all, from whence the whole race of mankind is deſcended; and hence we deduce, as an obvious and undeniable conſequence, that all men are in ſome degree, however remote, related to each other. For, indeed, if we only ſuppoſe each couple of our anceſtors to have left, one with another, two children; and each of thoſe children on an average to have left two more; (and, without ſuch a ſuppoſition, the human ſpecies muſt be daily diminiſhing) we ſhall find that all of us have now ſubſiſting nearly 270 millions of kindred in the 15th degree, at the ſame diſtance from the ſeveral common anceſtors as we ourſelves are; beſides thoſe that are one or two deſcents nearer to or farther from the common ſtock, who may amount to as many more. And, if this calculation ſhould appear incompatible with the number of inhabitants on the earth, it is becauſe, by intermarriages among the ſeveral deſcendants from the ſame anceſtor, a hundred or a thouſand modes of conſanguinity may be conſolidated in one perſon, or he may be related to us a hundred or a thouſand different ways.

The method of computing theſe degrees in the canon law (Decretal. 4. 14. 3 & 9.) which our law has adopted (Co. Litt. 23.) is as follows: We begin at the common anceſtor, and reckon downwards; and in whatſoever degree the two perſons, or the moſt remote of them, is diſtant from the common anceſtor, that is the degree in which they are related to each other. Thus, Titius and his brother are related in the firſt degree; for, from the father to each of them is counted only one; Titius and his nephew are related in the ſecond degree; for the nephew is two degrees removed from the common anceſtor; *viz.* his own grandfather, the father of Titius. See Blackſt. Comm. vol. ii.

Marriage is prohibited by the church to the fourth degree of conſanguinity incluſive; but, by the law of nature, conſanguinity is no obſtacle to marriage, except it be in the direct line. See MARRIAGE.

Conſanguinity terminates in the ſixth and ſeventh degree, excepting in the ſucceſſion to the crown; in which caſe, conſanguinity is continued to infinity.

The civilians call *fratres conſanguinei*, thoſe born of the ſame father; in oppoſition to *fratres uterini*, who are only born of the ſame mother. See DESCENT.

According to the common opinion, thoſe were not allowed to complain of an inofficious teſtament, *i. e.* of being diſinherited without cauſe; excepting from the turpitude of the perſon appointed heir in their place. But Van Water endeavours to ſhew the contrary; and urges, that the *conſanguinei* might plead inofficioſity, even where the teſtament was not made in favour of a perſon incapable. See KINDRED.

CONSAR, in *Geography*, a town of Perſia, in the province of Irak; 52 miles N.W. of Iſpahan.

CONSARBRUCK, or CONZ, a town of Germany, in the electorate of Treves, ſituated at the conflux of the Saar and the Moſelle; 2 miles S. of Treves.

CONSBACH, a town of Sweden, in South Gothland; 32 miles N. of Wardberg.

CONSCIENCE, in *Ethics*, a ſecret teſtimony or judgment of the ſoul, or as ſome have defined it, a diſtinct faculty or power of the mind, by which it gives its approbation

tion to things it does that are naturally good; and reproaches itſelf for thoſe that are evil. Or, conſcience is a dictate of the underſtanding power, concerning moral actions; conſidered as it has the knowledge of laws; and conſequently as conſcious of what is to be done, or not done, with regard to the legiſlator.

In the more popular ſenſe of the word, conſcience is a judgment, either true or falſe, whereby we pronounce a thing good or evil. This makes what we call the inner *forum*, or tribunal. Accordingly, it ſhould be conſidered, not as a mere intellectual light, or informing faculty, a dictate of the practical underſtanding (as the ſchools call it), which directs, admoniſhes, and influences us, in what we *are to do;* but as it *acts* back upon the ſoul by a reflection on what we *have done;* and is, by that means, the ſource and cauſe of all that joy, or dejection of mind, of thoſe internal ſenſations of pleaſure or pain, which attend the practice of great virtues or great vices.

Some divines maintain, that conſcience is infallible; and hold it to be that immutable law whereby God will judge men: they deny that the underſtanding can be the ſource of errors, and lay them all at the door of the will. A man, ſay they, may ſecure himſelf from error, by forbearing to judge of things till he have a clear and diſtinct perception of them.

Some of the ſchoolmen diſtinguiſh between the conſcience antecedent to an action, and that conſequent to it: the firſt, called *antecedent* conſcience, determines what is good, and what evil; and conſequently preſcribes what is to be done, and what avoided. *Conſequent* conſcience is a kind of ſecondary or reflex judgment, with regard to the goodneſs, &c. of things, already done or committed.

The *rule* of conſcience is the will of God, ſo far as it is made known to us, either by the light of nature, or by that of revelation. With reſpect to the knowledge of this rule, conſcience is ſaid to be *rightly informed*, or *miſtaken; firm*, or *wavering*, or *ſcrupulous*, &c. With reſpect to the conformity of our actions to this rule when known, conſcience is ſaid to be *good*, or *evil*, &c.

In a moral view, it is of the greateſt importance that the underſtanding be well informed, in order to render the judgment or verdict of conſcience a ſafe directory of conduct, and a proper ſource of ſatisfaction. Otherwiſe, the judgment of conſcience may be pleaded, and it has actually been pleaded, as an apology for very unwarrantable conduct. Many atrocious acts of perſecution have been perpetrated, and afterwards juſtified, under the ſanction of an erroneous conſcience. It is alſo of no ſmall importance, that the ſenſibility of conſcience be duly maintained and cheriſhed; for want of which men have often been betrayed into criminal conduct without ſelf-reproach, and have deluded themſelves with falſe notions of their character and ſtate.

Dr. Reid (See his "Eſſays on the active Powers of Man," p. 252, &c.) has made the following obſervations on that power of the mind, which we call conſcience. 1. Like all our other powers, it comes to maturity by inſenſible degrees, and may be much aided in its ſtrength and vigour by proper culture. 2. Conſcience is peculiar to man. We ſee no veſtige of it in brute animals; and it is therefore one of thoſe prerogatives by which we are raiſed above them. Conſcience is evidently intended by nature to be the immediate guide and director of our conduct, after we arrive at the years of underſtanding. Other principles may urge and impel; but this only authoriſes. Other principles ought to be controlled by this: this may be, but never ought to be controlled by any other, and never can be with innocence. From theſe obſervations it evidently follows, that the moral faculty of conſcience is both an active and an intellectual power of the mind. As an active principle, it ſometimes concurs with other active principles, ſometimes oppoſes them, and ſometimes is the ſole principle of action. As an intellectual principle, we have by it, and by it alone, the original conceptions of right and wrong in human conduct, in their different degrees and different ſpecies.

Philoſophers in lieu of the word *conſcience*, which ſeems appropriated to theological matters, frequently uſe that of *conſciouſneſs*; which ſee.

The power of conſcience has been remarked in all ages of the world, and under all diſpenſations of religion; and hiſtory, both ſacred and profane, furniſhes innumerable examples, that are eminently inſtructive. One remarkable inſtance of this kind occurs in the hiſtory of Joſeph and his brethren (ſee Gen. chap. xlii. and particularly v. 21.) Another is preſented to us in the account which the evangeliſt Matthew has given us of the feelings and reflections of Herod the tetrarch, when he heard of the fame of Jeſus, after he had occaſioned the death of John the Baptiſt. (See Matth. xiv. 1, 2, 3.) Biſhop Atterbury has admirably pourtrayed the ſtate of Herod's mind, in his excellent ſermon on this ſubject. (Sermons, vol. iv. Serm. 4.) Many inſtances of a ſimilar kind occur in profane hiſtory. We ſhall content ourſelves with ſelecting one, and ſhall give it in the words of the elegant preacher already cited. "Tiberius, that complete pattern of wickedneſs and tyranny, had taken as much pains to conquer theſe fears (referring to the fears of futurity before deſcribed) as any man, and had as many helps and advantages towards it, from great ſplendour and power, and a perpetual ſucceſſion of new buſineſs, and new pleaſures: and yet, as great a maſter of diſſimulation as he was, he could not diſſemble the inward ſenſe of his guilt, nor prevent the open eruptions of it upon very improper occaſions. Witneſs that letter which he wrote to the ſenate from his impure retreat at Capreæ. Tacitus has preſerved the firſt lines of it; and there cannot be a livelier image of a mind filled with diſtraction and deſpair than they afford us: *Quid, ſcribam vobis, P. C. aut quomodo ſcribam, aut quid omnino non ſcribam hoc tempore, Dei me Deæque pejus perdant, quàm perire quotidie ſentio, ſi ſcio!* that is, "What, or how, at this time, I ſhall write to you, fathers of the ſenate, or what indeed I ſhall not write to you, may all the powers of heaven confound me yet worſe than they have already done, if I know or can imagine!" And *his* obſervation upon it is well worthy of *ours*, and very appoſite to our preſent purpoſe: "In this manner (ſays he) was this emperor puniſhed by a reflexion on his own infamous life and guilt; nor was it in vain that the greateſt maſter of wiſdom (he means Plato) affirmed, that were the hearts of tyrants once laid open to our view, we ſhould ſee there nothing but ghaſtly wounds and bruiſes; the conſciouſneſs of their own cruelty, lewdneſs, and ill conduct, leaving as deep and bloody prints on their minds, as the ſtrokes of the ſcourge do on the back of a ſlave. Tiberius (adds he) confeſſed as much, when he uttered theſe words; nor could his high ſtation, or even privacy and retirement itſelf, hinder him from diſcovering to all the world the inward agonies and torments under which he laboured." Thus that excellent hiſtorian. We cannot forbear ſubjoining the following fact, related by Mr. Fordyce in his "Dialogues on Education" (vol. ii. p. 401), as a real occurrence which happened in a neighbouring ſtate not many years ago. A jeweller, a man of good character and conſiderable wealth, having occaſion, in the way of his buſineſs, to travel at ſome diſtance from the place of his abode, took along with him a ſervant, in order to take care of his portmanteau. He had with him ſome of his beſt jewels, and a large ſum of money, to which his ſervant was likewiſe privy. When the maſter had occaſion to diſmount on the road, the ſervant, watching his opportunity, took a piſtol from his maſter's ſaddle and ſhot him dead on the ſpot; he then rifled him of his jewels and money, and hanging a large ſtone to his neck, threw him into the neareſt canal. With this booty he made off to a diſtant part of the country, where he had reaſon to believe that neither he nor his maſter were known. There he began to trade in a low way at firſt, that his obſcurity might ſcreen him from obſervation, and in the courſe of ſeveral years ſeemed to riſe, by the natural progreſs of buſineſs, into wealth and conſideration; ſo that his good fortune appeared at once the effect and reward of induſtry and virtue. Of this he counterfeited the appearance ſo well, that he grew into great credit, married into a good family, and by laying out his hidden ſtores diſcreetly, as he ſaw occaſion, and joining to all an univerſal affability, he was admitted to a ſhare in the government of the town, and roſe from one poſt to another, till at length he was choſen chief magiſtrate. In this office he maintained a fair character, and continued to fill it with no ſmall applauſe, both as a governor and a judge; till one day as he ſat on the bench with ſome of his brethren, a criminal was brought before him who was accuſed of murdering his maſter. The evidence came out full, the jury brought in their verdict that the priſoner was guilty, and the whole aſſembly waited the ſentence of the preſident of the court (an office which that day belonged to him), with great ſuſpence. In the mean while he manifeſted an unuſual diſorder and agitation of mind, and his colour often changed; at length he aroſe from his ſeat, and coming down from the bench, placed himſelf juſt by the unfortunate man at the bar. "You ſee before you (ſaid he, addreſſing himſelf to thoſe who had ſat on the bench with him) a ſtriking inſtance of the juſt retaliation of heaven, which this day, after 30 years' concealment, preſents to you a greater criminal than the man juſt now found guilty." He then proceeded to make an ample confeſſion of his guilt, and of all its aggravations. "Nor can I feel (continued he) any relief from the agonies of an awakened conſcience, but by requiring that juſtice be forthwith done againſt me in the moſt public and ſolemn manner." We may eaſily ſuppoſe the amazement of the whole aſſembly, and eſpecially of his fellow-judges. However, they proceeded, upon this confeſſion, to paſs ſentence upon him, and he died with all the ſymptoms of a penitent mind.

CONSCIENCE, *Court of.* See COURT.

CONSCIOUSNESS, in *Logic* and *Metaphyſics*, is the mind's perception of its own exiſtence, faculties, and operations; and, in this view of it, it is one of the ſources of judgment, and one ſpecies of evidence. Conſciouſneſs, ſays Dr. Reid, (Eſſays on the Intellectual Powers of Man, p. 578,) is an operation of the underſtanding of its own kind, and cannot be logically defined. The objects of it are our preſent pains, our pleaſures, our hopes, our fears, our deſires, our doubts, our thoughts of every kind; in a word, all the paſſions, and all the actions and operations of our own minds, while they are preſent. We may remember them when they are paſt: we are conſcious of them only while they are preſent. It is, therefore, a *firſt* principle that every thing exiſts of which we are conſcious. When a man is conſcious of pain, he is certain of its exiſtence; when he is conſcious that he doubts, or believes, he is certain of the exiſtence of theſe operations. And his conviction of the reality of theſe operations is not the effect of reaſoning: it is immediate and intuitive. The exiſtence, therefore, of the paſſions and operations of our minds, of which we are conſcious, is a firſt principle, which nature requires us to believe upon her authority. Indeed, this is the only principle of common ſenſe, which has never been directly called in queſtion, and which retains its authority with the greateſt ſceptics. Mr. Hume, after annihilating body and mind, time and ſpace, action and cauſation, and even his own mind, acknowledges the reality of the thoughts, ſenſations, and paſſions of which he is conſcious. From this ſource of conſciouſneſs we derive all that we know, and indeed all that we can know, of the ſtructure, and of the powers of our own minds; from which we may conclude, that no branch of knowledge ſtands upon a firmer foundation; for ſurely no kind of evidence can go beyond that of conſciouſneſs. Some have confounded conſciouſneſs and reflection, though they are eſſentially diſtinct. The former is common to men at all times, but is inſufficient to give us clear and diſtinct notions of the operations of which we are conſcious, and of their mutual relations, and minute diſtinctions. The ſecond, or attentive reflection upon theſe operations, making them objects of thought, ſurveying them attentively, and examining them on all ſides, is ſo far from being common to all men, that it pertains to very few.

Another firſt principle, in relation to the ſubject of this article is, that the thoughts of which any one is conſcious are the thoughts of a being which he calls *himſelf*, his *mind*, his *perſon*. "If any man aſks a proof of this," ſays Dr. Reid, "I confeſs I can give none; there is an evidence in the propoſition itſelf, which I am unable to reſiſt. Shall I think, that thought can ſtand by itſelf without a thinking being? or that ideas can feel pleaſure or pain? My nature dictates to me that it is impoſſible. And that nature has dictated the ſame to all men, appears from the ſtructure of all languages; for in all languages men have expreſſed thinking, reaſoning, willing, loving, hating, by perſonal verbs, which from their nature require a perſon who thinks, reaſons, wills, loves, or hates. From which it appears, that men have been taught by nature to believe that thought requires a thinker, and reaſon a reaſoner, and love a lover."

"Here," continues Dr. Reid, "we muſt leave Mr. Hume, who conceives it to be a vulgar error, that beſides the thoughts we are conſcious of, there is a mind which is the ſubject of thoſe thoughts." If the mind be any thing elſe than impreſſions and ideas, it muſt be a word without a meaning. The mind, therefore, according to this philoſopher, is a word which ſignifies a bundle of perceptions; or when he defines it more accurately, "It is that ſucceſſion of related ideas and impreſſions, of which we have an intimate memory and conſciouſneſs." Whence it follows that "I am; ſays our author, "that ſucceſſion of related ideas and impreſſions, of which I have the intimate memory and conſciouſneſs. But who is the I that has this memory and conſciouſneſs of a ſucceſſion of ideas and impreſſions? Why, it is nothing but that ſucceſſion itſelf."

Identity of conſciouſneſs, according to Mr. Locke, conſtitutes identity of perſon. For a farther diſcuſſion of this ſubject, ſee IDENTITY.

CONSCRIPT, CONSCRIPTUS, a popular term in the Roman hiſtory, uſed in ſpeaking of ſenators, who were called *conſcript* fathers, *patres conſcripti;* becauſe their names were written in the regiſter, or catalogue of the ſenate.

Livy, lib. i. cap. 1. tells us, that when Brutus filled up the places of the ſenators cut off by Tarquin, with others choſen out of the equeſtrian order, thoſe new ſenators only had the appellation given them of *patres conſcripti*.

CONSCRIPTS alſo denote men raiſed to recruit the Imperial and French armies. All men capable of bearing arms in Hungary and Bohemia, have been uſually enregiſtered and obliged to march wherever their ſervices were called for. The conſcripts in France, during the laſt and preſent war, have been raiſed on ſimilar principles.

The militia of Great Britain comes likewiſe in ſome meaſure under this denomination or deſcription, with this difference, that the men have been raiſed by ballot, and do not leave their native country, unleſs they voluntarily offer their ſervices for that purpoſe.

CONSECRATION, the act of converting or ſetting apart, any profane, or common thing, to a pious purpoſe; with certain ceremonies, prayers, benedictions, &c. appropriate to it.

Conſecration is the reverſe of ſacrilege and profanation, which conſiſt in perverting a thing ſet apart for a pious purpoſe, to a profane and popular one.

The biſhop conſecrates a church, or a chalice; the pope conſecrates medals, agnus dei's, &c. and grants indulgences to thoſe who bear ſuch about them with devotion. The conſecration, or dedication, of a church is an epiſcopal ceremony, conſiſting in a great number of benedictions, with aſperſions and unctions of chriſm, &c. on the walls, both withinſide and without. The form for conſecrating churches, chapels, and church-yards, or places of burials, in England, may be ſeen in Wilkins's Concilia Magnæ Britanniæ, &c. vol. iv. p. 668. It directs that the biſhop and clergy, of whom there are to be at leaſt two, ſhall enter the church or chapel in their ſeveral habits, and, as they walk up from the weſt to the eaſt end, repeat alternately the 24th Pſalm; the biſhop beginning, "The earth is the Lord's," &c. with the "Gloria patri." When they are come to the Lord's table, the biſhop ſitting in his chair ſhall have the inſtrument of dedication, donation, and endowment of the church or chapel, church-yard, or burial-place, preſented to him by the founder, or ſome proper perſon, which he ſhall cauſe to be read by his regiſter, or other officer; and then the inſtrument ſhall be laid on the table, and he ſhall ſtand on the north ſide of it, and turning to the congregation, deliver an addreſs to them, which is followed by ſuitable prayers. One of the prieſts then reads the ſervice of the day, introducing proper pſalms and leſſons: after which, the biſhop proceeds to the communion ſervice, and inſtead of the collect of the day, uſes one proper to the occaſion. When the Epiſtle and Goſpel are read, they are ſucceeded by the Nicene creed and the ſermon; and then the biſhop is to proceed with the ſervice of the communion. When the ſervice in the church is finiſhed, the biſhop and clergy with the people ſhall go into the churh-yard, and make uſe of a prayer for the occaſion. See *ubi ſupra.*

The cuſtom of conſecrating perſons, temples, altars, veſtments, utenſils, &c. is very ancient; and all the ceremonies thereof are preſcribed under the old law. When thoſe conſecrations relate to men, they are properly called *ordinations*; excepting thoſe performed to biſhops and kings, which ſtill retain the name of *conſecration.* Thoſe which only conſiſt in a ceremony inſtituted by the church, are more properly called *benedictions.* When they regard churches, altars, veſſels, &c. they are properly called *dedications.*

In the trial of archbiſhop Laud, A. D. 1644, it was one of the charges alleged againſt him by the commons, that he had traiterouſly endeavoured and practiſed "to alter and ſubvert God's true religion by law eſtabliſhed in this realm, and wiſhed them to ſet up popiſh ſuperſtition and idolatry, and to reconcile us to the church of Rome." One branch of this charge was his introducing and practiſing certain popiſh innovations, and ſuperſtitious ceremonies, not warranted by law, nor agreeable to the practice of the church of England ſince the reformation. In proof of this charge, the managers, on the part of the commons, inſiſted on his countenancing the ſetting up of images in churches, church-windows, and other places of religious worſhip. See IMAGE.

Another popiſh innovation charged on the archbiſhop was, his ſuperſtitious manner of conſecrating chapels, churches, and church-yards, ſuch as had been practiſed in Creed-church, and in the church of St. Giles's in the Fields. The managers objected further, his conſecrating altars with all their furniture, as pattens, chalices, altar-cloths, &c. even to the knife that was uſed for cutting the ſacramental bread; and his dedicating the churches to certain ſaints, together with his promoting annual revels, or feaſts of dedication, on the Lord's day, in ſeveral parts of the country, by which that holy day was profaned, and the people encouraged in ſuperſtition and ignorance. With reſpect to the conſecration of churches, the archbiſhop replied, that the practice was as ancient as Moſes, who conſecrated the tabernacle, with all its veſſels and ornaments; that the temple was afterwards conſecrated by Solomon; that as ſoon as Chriſtian churches began to be built, in the reign of Conſtantine the Great, they were conſecrated, as Euſebius teſtifies concerning the church of Tyre, (E. H. l. x. c. 3.), and ſo it has continued to the preſent time. Beſides, if churches were not conſecrated, they would not be holy, &c. &c. As to the manner of conſecrating Creed-church, St. Giles's, &c. his grace confeſſed that, when he came to the church-door, that paſſage in the Pſalms was read, "Lift up your heads, O ye gates, even lift them up, ye everlaſting doors, that the king of glory may come in;" that he kneeled and bowed at his entrance into the church, as Moſes and Aaron did at the door of the tabernacle; that he declared the place holy, and made uſe of a prayer like one in the Roman pontifical; that afterwards he pronounced divers curſes on ſuch as ſhould profane it, but denied his throwing duſt into the air, in which he ſaid, the witneſſes had forſworn themſelves; for the Roman pontifical does not preſcribe throwing duſt into the air, but aſhes; and he conceived there was no harm, much leſs treaſon in it. As the conſecrating of churches, and alſo dedicating them to God, has been of ancient uſage, ſo has the conſecration of altars and their furniture; and ſuch conſecrations are neceſſary, for elſe the Lord's table could not be called holy, nor the veſſels belonging to it, as they uſually are; yea, there is an holineſs in the altar, which ſanctifies the gift, which it could not do, unleſs itſelf was holy; if there be no dedication of theſe things to God, no ſeparation of them from common uſe, then there can be no ſuch thing as ſacrilege, or difference between our holy table and a common one. And as to the form of conſecrating theſe things, the archbiſhop alleged, that he had it not from the Roman pontifical, but from biſhop Andrews.

The managers for the commons replied, that if the temple was conſecrated, it was by the king himſelf, and not by the high-prieſt; and if the tabernacle was conſecrated, it was by Moſes, the civil magiſtrate, and not by Aaron the high-prieſt; but we read, they ſaid, of no other conſecrating the tabernacle and its utenſils, but anointing them with oil, for which Moſes had an expreſs command; nor of any other conſecrating the temple, but of Solomon's making an excellent prayer in the outward court, not in the temple itſelf, and of his hallowing the middle court by offerings and peace-offerings; and it is obſervable, that the cloud and glory of the Lord filled the temple, ſo that the prieſts could not ſtand to miniſter before Solomon made his prayer, which ſome call his conſecration. But if it ſhould be allowed that the temple was conſecrated in an extraordinary manner, we have no mention either in Scripture, or in Jewiſh writers, of the conſecration of their ſynagogues, to which our churches properly ſucceed. And, after all, it is no concluſive way of arguing, to derive a Chriſtian inſtitution from the practice of the Jewiſh church, becauſe many of their ordinances were temporary, and aboliſhed by the coming of Chriſt. Moreover, it is ſaid, that from the beginning of Chriſtianity, we have no credible authority for conſecrating churches for 300 years. Euſebius, in his life of Conſtantine the Great, does indeed mention his conſecrating a temple which he built over our Saviour's ſepulchre at Jeruſalem; but how?—with prayers, diſputations, preaching, and expoſition of ſcripture, as he expreſsly defines it (cap. 45.) Here were no proceſſions, no knocking at the doors by the biſhop, crying, "Open ye everlaſting doors;" no caſting duſt or aſhes into the air, and pronouncing the ground holy; no reverencing towards the altars, nor a great many other inventions of later ages. Theſe were not known in the Chriſtian church, till the very darkeſt times of popery; nay, in thoſe very dark times, we are told by Otho, the pope's legate, in his Eccleſiaſtical Conſtitutions, that in the reign of king Henry III., there were not only divers pariſh churches, but ſome cathedrals in England, which had been uſed for many years, and yet never conſecrated by a biſhop. But the archbiſhop's method of conſecrating churches, it is ſaid, evidently appears to be a modern popiſh invention; for it is agreed by Gratian, Platina, the Centuriators, and others, that the popes Hyginus, Gelaſius, Silveſter, Felix and Gregory, were the firſt inventors and promoters of it; and it is no where to be found but in the Roman pontifical, publiſhed by command of pope Clement VIII. (De Eccleſiæ dedicatione, p. 209, 280.) for which reaſon it was exploded and condemned by our firſt reformers, and particularly by biſhop Pilkington, in his comment upon Haggai (ch. i. v. 7, 8.) and archbiſhop Parker, who (in his Antiq. Brit. p. 85, 87.) expreſsly condemns the archbiſhop's method of conſecration, as popiſh and ſuperſtitious. (See ALTAR.)

The archbiſhop, however, ſays, that if churches are not conſecrated, they cannot be holy; whereas many places that were never conſecrated are ſtyled holy, as the moſt holy place, and the holy city Jeruſalem; and our homilies ſay, that the church is called holy, not of itſelf, but becauſe God's people reſorting thither are holy, and exerciſe themſelves in holy things; and it is evident that ſanctification, when applied to places, is nothing elſe but a ſeparation of them from common uſe to a religious and ſacred purpoſe, which may be done without the ſuperſtitious method abovementioned; and though the archbiſhop avers, that he had not his form of conſecration from the Roman pontifical, he acknowledges that he had it from biſhop Andrews, who could have had it no where elſe.

As for the conſecration of altars, pattens, chalices, altar-cloths, and other altar-furniture, its original is no higher than the Roman miſſal and pontifical, in both which there are particular chapters and ſet forms of prayer for this purpoſe: but to imagine that theſe veſſels may not be reputed holy, though ſeparated to an holy uſe, unleſs they are thus conſecrated, is deſtitute of foundation in reaſon or ſcripture, and contrary to the practice of the church of England, and the opinion of our firſt reformers. As to the practice of *dedication*, &c. ſee DEDICATION. Neal's Hiſt. of the Puritans, vol. ii. ch. 5. 4to.

CONSECRATION *of the Pope*, a ceremony which is particularly deſcribed by cardinal Raſponi, in his book concerning the church of the Lateran; and which is alſo related by father Bonanni, in his medallic hiſtory of the popes; and by Lenfant, in his hiſtory of the council of Conſtance. "Before the uſage of the conclave was introduced by Gregory the tenth," ſays cardinal Raſponi, "the cardinals, three days after the obſequies of the former pope, convened in the Lateran church, where, after the invocation of the Holy Spirit, and the celebration of maſs, they proceed to the election of a pope. The election being made, the firſt cardinal deacon inveſted the pope elect in his pontifical habits, and announced the name which he choſe to take;" for it has been the cuſtom now, for ſeveral centuries, that the pope ſhould aſſume a new name on being elected. "Afterwards, two cardinals, the moſt eminent in dignity, one on his right hand, the other on his left, conducted him to the altar, where he proſtrated himſelf in adoration of God, whilſt they ſang the *Te Deum*. After the *Te Deum*, the cardinals ſeated the pope in a marble chair, which was behind the altar, under a ſort of dome, or vault, where the pope, being ſet, admitted the cardinals, the biſhops, and ſome others, to kiſs his feet, and to receive the *kiſs of peace*. Then the pope riſing, the cardinals conducted him through the portico to another chair, bored like what is called in French, *ſelle percée*. This chair was thence very properly named *ſtercoraria*, the ſtercorary. It was formerly placed before the portico of the patriarchal baſilic, and is now to be ſeen in the cloiſter of that baſilic." The uſe of theſe chairs, however, was afterwards aboliſhed by Leo the tenth, probably for this, amongſt other reaſons, becauſe the perforated chair was become connected with the fabulous ſtory of the female pope. That, however, is not a proteſtant fable, as ſome perſons ignorantly pretend, for it was current long before the days of Luther. But the continuance of the uſe of that chair preſerved the memory of the ſtory, and might appear to the credulous an evidence of its truth. Whilſt the pope ſat on the ſtercorary, the choir ſang theſe words of ſcripture: Suſcitat de pulvere egenum, et de ſtercore erigit pauperem, ut ſedeat cum principibus, et ſolium gloriæ teneat. Pſalm, cxiii. 7. The laſt clauſe is not in the pſalm. *He raiſeth the poor out of the duſt, and lifteth the needy off the dunghill, that he may ſet him with the princes of his people, and that he may poſſeſs the throne of glory.* The intention of this ceremony, it was ſaid, was to inſinuate to the pope the need there is of the virtue of humility, which ought to be the firſt ſtep of his greatneſs. After remaining ſome time in this chair, the pope received from the hands of the chamberlain three deniers, which he threw to the people, pronouncing theſe words: *Silver and gold I have none for my pleaſure, but what I have I give you.* Afterwards, the prior of the Lateran baſilic, and one of the cardinals, or one of the canons of that baſilic, took the pope between them, and whilſt they walked in the portico, ſhouts of acclamation were raiſed near the baſilic, and the election was declared, with the name which the pope had taken. In this manner they conducted the pope to the baſilic of St. Sylveſter, where, being placed before this baſilic in a chair of porphyry, the prior of the baſilic put into his hands a *ferula*, in ſign of correction and government, and the keys, to denote the power which God gave to St. Peter, prince of the apoſtles, of opening and ſhutting, of binding and looſing, and which paſſes (according to our hiſtorian) ſucceſſively to all the Roman pontiffs. Thence the pope, carrying the ferula, and the keys, went to place himſelf in another chair, reſembling the former; and after remaining there ſome time, reſtored the ferula and the keys to the prior, who girt him with a girdle of red ſilk, giving him a purſe of the ſame colour and ſtuff, wherein there were twelve precious ſtones, and a ſmall bit of muſk. Onuphrius, in his treatiſe on the baſilic of the Lateran, ſays, that it was the prior of this baſilic who gave theſe things to the pope. His ſitting in the two chairs denoted the primacy which St. Peter conferred on him, and the power of preaching the goſpel conferred by St. Paul. The girdle ſignified continence and chaſtity, the purſe denoted the treaſure, out of which the poor were to be nouriſhed, the twelve precious ſtones repreſented the power of the twelve apoſtles, which reſides totally in the pontiff; in fine, the muſk denoted the fragrancy of good works, according to that ſaying, *We are to God a ſweet ſavour of Chriſt.* In this chair the pope elect admitted the miniſters of the palace to kiſs his feet, and to receive the kiſs of peace. There, too, ſeveral pieces of ſilver were delivered to him by the chamberlain, to the value of ten pence. Theſe he threw to the people at three different times, pronouncing theſe words, *He hath ſcattered; he hath given to the poor; his righteouſneſs remaineth for ever.* All this being done, the pope elect went next Sunday, attended by all the orders of the ſacred palace, and the principal people of the city, to the baſilic of the Vatican, and there, before the confeſſion of St. Peter, he was ſolemnly conſecrated by the biſhop of Oſtia, to whom this office ſpecially belongs. After this function, the archdeacon and the ſecond deacon gave the pall to the pope, the archdeacon pronouncing theſe words, *Receive the pall, which is the plenitude of the pontifical office, to the honour of Almighty God, of the moſt happy virgin his mother, of the bleſſed apoſtles St. Peter and St. Paul, and of the holy Roman church.*"

After this deſcription, cardinal Raſponi adds theſe words: "This is what was done when the pontiff was announced or proclaimed in the church of the Lateran; but when the election was made in the Vatican, the pope, immediately after being conducted to the altar by two cardinals, or after having performed his adoration, and offered a ſecret prayer, kneeling, was placed in a chair behind the altar, where he admitted the cardinal biſhops, and the others, during the ſinging of the *Te Deum*, to kiſs his feet, and to receive the kiſs of peace. The following Sunday they aſſembled in the ſame church, and the pope, crowned according to the cuſtom of his anceſtors, went to the Lateran palace; but before entering it, he ſeated himſelf in the *ſtercorary*, where, ſitting down thrice, according to cuſtom, he was introduced by the cardinals into the baſilic, diſtributing money to the populace. There he aſcended a throne behind the altar, where he admitted the canons of the baſilic to kiſs his feet, and to receive the kiſs of peace: which being done, he went to place himſelf in the chairs that were before the oratory of St. Sylveſter, where all was performed that has been recited above. But if it happened that the pope was created out of Rome, all the clergy, when he made his entry into that city, and before entering the gate of the Lateran, went to meet him without the gate, in pontifical habits, with the ſtandard of the croſs and cenſers; and, entering thus into the Lateran church, they obſerved, though in an order ſomewhat different, all the ceremonies mentioned above. And if the pope, coming to Rome after his conſecration, went to the church of St. Peter, the ſame rites were uſed there as in the Lateran church, except only that he did not receive the canons of St. Peter to kiſs his feet in the portico, and that he did not ſit down on the *ſtercorary*, which is not in that church. For this reaſon, the next day after maſs, he went without the tiara to the Lateran palace, and before entering the baſilic, he placed himſelf on the ſtercorary, with the accuſtomed ceremonies."

CONSECRATION, or, as it is more uſually called, BENEDICTION *of the waters*, denotes a ceremony annually practiſed in the Greek church, on the 6th of January, or, as we denominate it, Twelfth-day. For this ceremony at St. Peterſburg, a ſort of wooden chapel or tabernacle, painted green, and ſtuck round with boughs of firs, is conſtructed on the ice of the Neva, between the Admiralty and the Imperial palace. This little building is covered with a dome, reſting on eight ſmall columns, on which ſtands the figure of John the Baptiſt, with the croſs in his hand, amidſt bulruſhes; the inſide of the edifice being decorated with paintings, repreſenting the baptiſm of Jeſus, his transfiguration, and other tranſactions of his life. From the centre of the dome is ſuſpended, by a chain, a monſtrous large holy-ghoſt of wood, over the aperture in the ice, round which are ſpread rich carpets. This little temple is entirely ſurrounded with paliſadoes, which are alſo ornamented with fir-branches; the ſpace within being likewiſe covered with carpets. A ſort of gallery round the building communicates with a window of the palace, from which the imperial family come forth to attend the ceremony; though for ſeveral years paſt (ſays Mr. Tooke) the empreſs and her grandchildren only ſaw the ſolemnity from the windows of the palace. The ceremony begins immediately when the regiments of guards have taken their ſtation on the river. Then the archbiſhop appears amid the ſound of church-bells and the firing of the cannon of the fortreſs, and proceeds along the carpets, attended by his train of biſhops and other eccleſiaſtics, into this little church, where, ſtanding at the hole in the ice, he dips his crucifix three times in the water, at the ſame time repeating prayers, and concludes with a particular one to the great ſaint Nicholas; which done, the water is accounted bleſſed. The prelate then ſprinkles with it the whole ſurrounding multitude, and the banners of all the regiments which are at that time in Peterſburg. When the conſecration is ended, he retires: and now the people preſs in crowds to the hole in the ice, where they drink it with pious avidity; mothers, notwithſtanding the cold, dip their naked babes in the ſtream, and men and women pour it on their heads; every one holds it a duty to take home a veſſel of the water, in order to purify their houſes, and for the cure of certain diſeaſes, for which it is affirmed to be a powerful ſpecific: during which four popes, one at each corner of the aperture, chant a ſort of litany for the occaſion. Tooke's Life of Cath. II. vol. i. p. 180.

CONSECRATION, in *Eccleſiaſtical Law*, is one of the ways by which a benefice may be vacated; the others being by death, by ceſſion, by reſignation, and by deprivation. Thus, when a clerk is promoted to a biſhopric, all his other preferments are void the inſtant he is conſecrated; but there is a method, by the favour of the crown, of holding ſuch livings *in commendam*; which ſee.

CONSECRATION is particularly uſed for the benediction of the elements in the euchariſt.

The Romaniſts define it, the converſion of the bread and wine into the real body and blood of Jeſus Chriſt: and that this is the ſentiment of their church, is evident from the prieſt's elevating the hoſt immediately after conſecration, for the people to adore it. See ELEVATION, HOST, &c.

There is a great controverſy between the Latin and Greek churches, touching the words of conſecration; the common opinion among the Romaniſts, agreeable to St. Thomas and the ſchoolmen, is, that the conſecration of the bread and wine conſiſts in theſe words, *This is my body; this is my blood.* The Greeks, on the contrary, attribute the change of the elements to a certain prayer, which they call the *invocation of the Holy Ghoſt*, rehearſed after the words, *This is* *my body; this is my blood;* which the Greeks maintain are only neceſſary in the proceſs of the conſecration, as they contain the hiſtory of the inſtitution; not as they contribute any thing to the change.

CONSECRATION *of various animals,* was common among the ancient Greeks and Romans. Suetonius mentions the conſecration of a great number of horſes by Julius Cæſar, when he paſſed the Rubicon; and Euſtathius obſerves, that it was common among the Greeks to conſecrate whole herds of cattle, and ſeveral ſorts of fowls, eſpecially geeſe and peacocks, to their gods; giving ſuch animals their liberty, and forbidding all perſons to touch or moleſt them. Athenæus remarks, that they paid the ſame reſpect to fiſhes, particularly thoſe beſt adapted to the palate; and Pliny takes notice, that the dolphin of Octavius Anicius had this favour conferred upon him. Ælian likewiſe relates, that they ſometimes put necklaces about the necks of their fiſhes, and then turned them looſe to their proper element. The Romans alſo had their magical conſecrations: it being cuſtomary for their emperors to offer ſacrifices, repeat charms, and diſpoſe ſtatues in certain places, imagining that ſuch magical operations would hinder barbarians from entering their dominions. Thus Marcus Antoninus endeavoured to fortify himſelf againſt the invaſion of the Marcomanni; and ſome have thought that the palladium of Troy, and the vocal ſtatue of Memnon, were of this kind. Macrobius has given us a particular deſcription of the conſecration of the Roman pontiffs, to the following purport: they dug a pit in the earth, into which the perſon to be conſecrated was let down, dreſſed in prieſtly veſtments, and the pit was covered with a plank bored almoſt full of holes; a bull, crowned with garlands of flowers, was placed on this plank, and his throat being cut, the blood poured through the plank on the prieſt, who received it on his head and face. On aſcending from the pit, covered with blood, he received the ſalutation of *Pontifex.*

CONSECRATION, among *Medaliſts,* is the ceremony of the *apotheoſis* of an emperor; or his tranſlation into heaven, and reception among the gods. See APOTHEOSIS.

On medals, the *conſecration* is thus repreſented: on one ſide is the emperor's head, crowned with laurel, ſometimes veiled; and the inſcription gives him the title of *divus:* on the reverſe is a temple, a buſtum, an altar, or an eagle taking its flight towards heaven, either from off the altar, or from a cippus: at other times the emperor is ſeen in the air, borne up by the eagle; the inſcription always, CONSECRATIO.

Theſe are the uſual ſymbols: yet on the reverſe of that of Antoninus, is the Antonine column. In the apotheoſis of empreſſes, inſtead of an eagle there is a peacock. As to the honours rendered theſe princes after death, they were explained by the words *conſecratio, pater, divus,* and *deus.* Sometimes around the temple or altar are put, *memoria felix,* or *memoriæ æternæ:* for princeſſes, *æternitas,* and *ſideribus recepta:* on the ſide of the head, *dea,* or Θεα. See MEDAL.

CONSECTARY, a propoſition that follows, or is deduced, from ſome preceding definition, lemmata, axioms, concluſions, or the like. Some rather chooſe to call it a *conſequence:* and others a *corollary,* &c.

CONSECUTIVE CHORDS, in *Muſic,* are ſuch as immediately ſucceed each other in compoſition or performance. See MUSIC, *Plate* IV. Holder truly obſerves, when ſpeaking of the rule in compoſition, which diſallows a ſucceſſion of octaves or fifths, except by contrary motion, that in ſtrictneſs the ſame applies to all conſecutive intervals whatever; but that the intermixture of major and minor thirds, and major and minor-ſixths in the ſcale, renders the occurrence of conſecutive major-thirds, major-ſixths, minor-thirds or minor-ſixths, very rare and inoffenſive in their cloying effect upon the ear, compared with thoſe of fourths, fifths, or octaves, if care is not taken by the compoſer to prevent the ſucceſſion of the latter, except in contrary motions.

CONSECUTIVELY, CONSECUTIVÉ, in the *School Philoſophy,* is ſometimes uſed in oppoſition to *antecedently,* and ſometimes to *effectively,* or *cauſally.*

Thus, ſay the ſchoolmen, the corruption of one thing is the generation of another, not *effectively,* but *conſecutively:* that is, ſince matter cannot be without form, it is neceſſary, that the generation of one thing follow upon the corruption of another.

CONSEDIA, in *Ancient Geography,* a place of Gallia Lyonnenſis, ſituated, according to the Itinerary of Antonine, between *Condate* and *Fanum Martio.*

CONSEIL DE GUERRE, Fr. *Council of War.* This is compoſed of the general in chief, and the general officers of the army, which he commands, whether it be held for the purpoſe of deliberating among themſelves on the meaſures they ought to purſue in a difficult conjuncture, of an offenſive or defenſive nature or otherwiſe; or for ſome act of military juſtice; or for accepting, regulating, ſtipulating, or refuſing articles of a propoſed capitulation; or for eſtabliſhing rules and regulations for the police and diſcipline of the troops; or, in fine, for judging of any military crime or offence.

CONSEIL *de Guerre ſecret,* Fr. A ſecret council of war. A ſecret council held by the king and his miniſters for deliberating on a defenſive, offenſive, or federative war.

CONSENT *of* PARTS, in the *Animal Economy.* See SYMPATHY.

CONSENTES, in *Mythology,* derived from the old Latin *conſo, to counſel,* denote twelve ſuperior deities among the Romans, or the "dii majorum gentium," who were apprehended to belong to the council of Jupiter. They were comprehended by Ennius in the following diſtricts:

> "Juno, Veſta, Minerva, Ceres, Diana, Venus, Mars,
> Mercurius, Jovis, Neptunus, Vulcanus, Apollo."

Thoſe which were eſteemed the ſuperior deities, and were the principal objects of the Pagan worſhip, had been men, according to Cicero (Taſcul. Diſput. lib. i. c. 12, 13.); and this was taught even in the myſteries. Varro mentions twelve deities under the ſame denomination, who ſuperintended agriculture. Lib. i. De Re Ruſtica.

Theſe conſentes had a temple at Piſa in Italy; and they had their common altar at Athens, as Plutarch (in Nicia) informs us. Ariſtophanes ſays, it was uſual to ſwear by them. In ancient inſcriptions they are thus marked; J.O.M. *i.e. Jovi optimo maximo,* CÆTERISQ. DIS CONSENTIBUS. They were alſo called "Dii magni," "cæleſtes," or "nobiles;" and are repreſented as occupying a different part of heaven from the inferior gods, who are called "Plebs."

CONSENTIA were feaſts inſtituted in honour of theſe deities.

CONSENTIA, in *Ancient Geography, Coſenza,* a town of Italy and capital of the country of the Brutii by whom it was built. It was ſituated on the ſmall river Crathis. Alexander, king of Epirus, ſurpriſed it in his expedition into Italy. See COSENZA.

CONSEQUENCE, in *Logic,* the concluſion of a reaſoning, or argument.

The two premiſes of a ſyllogiſm being granted, the conſequence muſt alſo be granted.

In a more reſtrained ſignification, conſequence is uſed for the relation or connexion between two propoſitions, whereof one follows, or is inferred, from the other.—Thus: *It is an animal, and therefore feels.*

CONSEQUENT, the laſt propoſition of an argument; being ſomething deduced or gathered from a preceding argumentation. An enthymeme only contains two propoſitions, the *antecedent* and *conſequent:* if the *antecedent* be abſurd, the *conſequent* muſt be ſo too.

Consequent, in a more preciſe ſenſe, is uſed for the propoſition which contains the concluſion, conſidered in itſelf, and without any regard to the *antecedent:* in which ſenſe, the *conſequent* may be true, though the *conſequence* be falſe.

Consequent *of a ratio*, in *Arithmetic*, the latter of the two terms of a ratio: or that to which the antecedent is referred. See Proportion.

Thus, in $a : b$, or a to b, b is the conſequent, a the antecedent.

CONSEQUENTS, in *Rhetoric*, are alſo uſed to ſignify ſuch things, as being allowed, neceſſarily, or very probably, infer their antecedents. Thus with reſpect to a ſubſtance, it is corruptible, and therefore material.

CONSEQUENTE, in the *Italian Muſic*, is uſed to ſignify concords, or thoſe intervals which afford pleaſure, be they either perfect, as the fifth and eighth, or imperfect, as the third, ſixth, &c. See Octave.

CONSEQUENTIA, in *Aſtronomy*, is oppoſed to *antecedentia;* and a motion *in conſequentia* is a motion in the order of the ſigns of the zodiac.

CONSEQUENTIAL Damages, in *Law*. See Damage.

CONSEQUENZA, *Ital.* a term in *Muſic*, uſed by Zarlino and other old authors, inſtead of *Fuga;* but P. Martini makes it ſynonymous with *Ripoſta*, or reply to a ſubject given.

CONSERANS, or Conferans, in *Geography*, the name, before the revolution, of a country in France, in Gaſcony, and the dioceſe of a biſhop, who reſided at St. Liſier, the capital; it was bounded on the eaſt by Foix, on the ſouth by Catalonia, and on the north and weſt by Comminges.

CONSERVATION, in *Ontology*, denotes giving duration, or continuance in exiſtence to all creatures, in contradiſtinction to creation, which gives exiſtence to all created ſubſtances. Some of the ancient ſchoolmen have repreſented conſervation as a continued creation; to which it has been objected that as God, whenever he creates a ſubſtance, muſt create it with all the properties, modes, and accidents which belong to it, it will follow, that he muſt at the ſame time create or give being to, all their ſinful thoughts and inclinations, and even their moſt criminal and abominable actions; or, in the moſt complete ſenſe of the term, be the author of ſin. Watts's Philoſ. Eſſ. Eſſ. xi § 4.

CONSERVATIVE Suture. See Suture.

CONSERVATOR, an officer eſtabliſhed for the ſecurity and preſervation of the privileges granted to ſome cities and communities; or, a perſon who has a commiſſion to judge of, and decide, the differences ariſing among them. In moſt catholic univerſities, there are two *conſervators;* the *conſervator* of royal privileges, or thoſe granted by kings; and the *conſervator* of apoſtolical privileges, or thoſe granted by the pope. The firſt takes cognizance of perſonal and mixed cauſes between the regents, ſtudents, &c. and the latter of ſpiritual matters between eccleſiaſtics.

Anciently there were appointed *conſervators* of treaties of peace between princes; and theſe conſervators became judges of the infractions made on a treaty, and were charged with procuring ſatisfaction to be made. They were uſually the feudatories of the ſeveral powers. In lieu of conſervators, princes now have recourſe to other indifferent princes to guarantee their treaties. See Guarantee.

Conservator *of the peace*, in our *Ancient Cuſtoms*, was a perſon who had an eſpecial charge, by virtue of his office, to ſee the king's peace kept.

Till the erection of juſtices of the peace by king Edward III. there were ſeveral perſons who by common law were intereſted in keeping the ſame: ſome having that charge as incident to other offices; and others ſimply, or of itſelf, called *cuſtodes*, or *conſervators of the peace.* Thoſe that were ſo by virtue of their office ſtill continue; but the latter are ſuperſeded by the modern juſtices.

The chamberlain of Cheſter is ſtill a *conſervator* in that county: by virtue of his office. 4 Inſt. 212.

Sheriffs of counties at common law are conſervators of the peace; and conſtables, by the common law, were conſervators, but ſome ſay they were only ſubordinate to the conſervators of the peace, as they now are to the juſtices.

The king's majeſty is, by his office and dignity royal, the principal conſervator of the peace within all his dominions; and may give authority to any other to ſee the peace kept, and to puniſh ſuch as break it: hence it is uſually called "the king's peace." The lord chancellor, or keeper, the lord treaſurer, the lord high ſteward of England, the lord mareſchal, the lord high conſtable of England, (when any ſuch officers are in being,) and all the juſtices of the court of King's Bench (by virtue of their offices,) and the maſter of the rolls (by preſcription) are general conſervators of the peace throughout the whole kingdom, and may commit all the breakers of it, or bind them in recognizances to keep it. The other judges are only ſo in their own courts. The coroner is alſo a conſervator of the peace within his own county; as is alſo the ſheriff; and both of them may take a recognizance or ſecurity for the peace. Conſtables, tithing-men, and ſuch like, are alſo conſervators of the peace within their own juriſdiction; and may apprehend all breakers of the peace, and commit them till they find ſureties for their keeping it.

Thoſe that were, without any office, ſimply and merely conſervators of the peace, either claimed that power by preſcription, or were bound to exerciſe it by the tenure of their lands; or, laſtly, were choſen by the freeholders in full county court before the ſheriff; the writ for their election directing them to be choſen "de probioribus et potentioribus comitatus ſui in cuſtodes pacis." But when queen Iſabel, the wife of Edward II., had contrived to depoſe her huſband by a forced reſignation of the crown, and had ſet up his ſon Edward III., in his place, this being an unprecedented meaſure, cauſed an alarm; and, therefore, in order to prevent any inſurrections, and diſturbance of the peace, the new king ſent writs to all the ſheriffs of England, vindicating the manner of his obtaining the crown, and commanding each ſheriff to keep the peace throughout his bailiwick, on pain and peril of diſinheritance and loſs of life and limb. Soon after it was ordained in parliament, that for the better maintaining and keeping of the peace in every county, good men and lawful, who were no maintainers of evil, or barretors in the country, ſhould be aſſigned to keep the peace. Thus, and at this time, the election of conſervators of the peace was taken from the people, and given to the king; ſuch aſſignment being conſtrued to be by the king's commiſſion. Nevertheleſs, they were ſtill called only conſervators, wardens, or keepers of the peace, till the ſtatute 34 Edw. III. c. 1. gave them the power of trying felonies; and then they acquired the more honourable appellation of juſtices. Blackſt. Comm. vol. i. See JUSTICE.

CONSERVATOR *of the truce and ſafe conducts; conſervator induciarum & ſalvorum regis conductuum*, was an officer appointed in every ſea-port, under the king's letters patent. His charge was to enquire of all offences committed againſt the king's truce and ſafe conducts, upon the main ſea, out of the franchiſes of the cinque-ports, as the admirals were wont to do, and ſuch other things as are declared in ſtatute 2 Hen. V. ſt. 1. cap. 6.

Two men learned in the law of the land were joined to ſuch conſervators, for hearing and determining according to that law the ſame treaſons, when committed within the body of any county. The above-cited ſtatute, ſo far as it made theſe offences amount to treaſon, was ſuſpended by 14 Hen. VI. c. 8., and repealed by 20 Hen. VI. c. 11., but revived by 29 Hen. VI. c. 2., which gave the ſame powers to the lord chancellor, aſſociated with either of the chief juſtices, as belonged to the conſervators of truce and their aſſeſſors; and enacted that, notwithſtanding the party be convicted of treaſon, the injured ſtranger ſhould have reſtitution of his effects, prior to any claim of the crown. See SAFE *Conduct.*

CONSERVATORIO, *Ital.* a title given in Italy to almoſt all charity-ſchools; but chiefly to thoſe where children are taught muſic, and are otherwiſe educated with a view to that profeſſion. The *conſervatorios* of the city of Venice have been much celebrated by all travellers previous to the revolution: it had four of theſe ſchools: the *Oſpidale della Pietà*, the *Mendicanti*, the *Incurabile*, and the *Oſpidaletto a S. Giovanni e Paulo*, at each of which there was a performance every Saturday and Sunday evening, as well as on great feſtivals. At theſe, the performers, both vocal and inſtrumental, were all girls; the organ, violins, flutes, violoncellos, baſſoons, and even double-baſes, kettle-drums, and French-horns, were ſupplied by females. Each of theſe eſtabliſhments was a kind of foundling hoſpital for natural children and orphans, under the protection of ſeveral nobles, citizens, and merchants, who, though the revenue is very great, yet contribute annually to its ſupport. Theſe girls are maintained here till they are married, and all thoſe who have talents for muſic are taught by the beſt maſters of Italy.

There were three conſervatorios in the city of Naples, for the education of boys who were intended for the profeſſion of muſic, of the ſame kind with thoſe of Venice, for girls. As the ſcholars in the Venetian conſervatorios have been juſtly celebrated for their taſte and neatneſs of execution, ſo thoſe of Naples have long enjoyed the reputation of being the firſt *contra-puntiſts*, or compoſers in Europe. It is from theſe ſeminaries that Italy, and all Europe, have been delighted with the genius and talents of the two Scarlattis, Vinci, Leo, Pergoleſi, Porpora, Farinelli, Cafarelli, Gizziello, Durante, Jomelli, Perez, Piccini, Trueta, Anfoſſi, Sacchini, Paeſiello, and innumerable others of the firſt eminence among compoſers and performers both vocal and inſtrumental.

CONSERVATORY, in *Gardening*, a place conſtructed ſomewhat in the manner of the green-houſe, but more ſpacious and elevated, and finiſhed in a neater and more perfect manner; being deſigned for containing and preſerving the more rare and curious ſorts of exotic plants, as well as for affording amuſement by being provided with walks laid with ſome ſort of neat material, according to the taſte of the proprietor, in a ſerpentine or other irregular manner between the plants.

Houſes of this nature ſhould have dry and rather elevated ſituations, at a ſmall diſtance from the reſidence, and be ranged in ſuch a manner as to have the benefit of the ſun as much as poſſible during the day. They muſt likewiſe be provided with flues for the purpoſe of communicating fire heat when it may be neceſſary, and alſo valves and other contrivances for the introduction of freſh air when wanted, and to afford due ventilation.

The ſides, ends, and roofs, muſt be formed with glaſs, as in the green-houſe, in order to admit light freely, and at the ſame time protect the plants.

It has been generally conſidered as ſynonymous with green-houſe, but its principle or eſſential difference conſiſts in this, that in the latter the trees and plants are either in tubs or pots; and placed on ſtands or ſtages through the winter till they are removed into ſome ſheltered ſituation abroad for the ſummer; while in the former the ground plan is laid out in beds and borders made up of the fineſt compoſitions of ſoils or of earthy materials that can be procured, three or four feet in depth; in which the trees and plants, taken out of their tubs or pots, are regularly planted, in the ſame manner as hardy plants in the open air. And inſtead of taking out the plants in the ſummer, as in the green-houſe, the whole of the glaſs roof is taken off, and the plants expoſed to the open air; when on the approach of autumn-froſts the lights are again put on, and remain ſo till the ſtate of the ſeaſon is ſuch as that they can be removed again without danger from cold.

In caſes of neceſſity, it is evident however that theſe buildings may alſo be uſed as green-houſes by introducing ſtages inſtead of beds, in which caſe the glaſs-roof ſhould be fixed. Other conveniences may be attached to them, ſuch as retiring rooms, ſeed rooms, aviaries, &c. Some buildings of this ſort are, according to the editor of Miller's dictionary, formed ſo as to have one of the wings facing the ſouth-eaſt, and the other the ſouth-weſt, ſo that from the time of the ſun's firſt appearance upon any part of the building, until it goes off at night, it may be conſtantly reflected from one part to the other, and the cold winds be alſo kept off from the front of the centre building. In the area of the adjoining rooms or wings, many of the more tender exotic plants may be placed in the ſummer ſeaſon and in the ſpring before the plants can be ſet out. The beds and borders of this area may be full of anemonies, ranunculuſes, early tulips, &c. which will be paſt flowering, and the roots fit to take out of the ground, by the time the plants are taken out of the houſe. In the centre of this area may be a ſmall baſon of water, which will be very convenient for watering the plants, not only on account of its nearneſs, but becauſe the water will be ſoftened and warmed by the reflection from the glaſſes. And the wing facing the ſouth-eaſt ſhould always be preferred for the warmeſt, or bark-ſtove, becauſe the ſun, at its firſt appearance in the morning, ſhines directly upon the glaſſes, and warming the air of the houſe, gives new life to the plants, after the long nights of the winter ſeaſon.

It is alſo farther obſerved, that in theſe buildings, if there are not ſheds running behind them their whole length, the walls ſhould not be leſs than three bricks thick, and if they are even more it will be better, becauſe where the walls are thin and expoſed to the open air, the cold will penetrate; and when the fires are made the heat comes out through the walls, ſo that it will require a larger quantity of fuel to maintain a proper temperature of warmth in the houſes; and in general, the cloſer and better theſe houſes are built, the leſs fuel will be required to warm them, ſo that the firſt expence in building them properly will be the cheapeſt, where the after expence of fires is taken into the account.

The ground plan and elevation of an elegant and very convenient improved houſe of this ſort may be ſeen in the appropriate plate.

CONSERVATORY is ſometimes uſed for a place to preſerve ſnow and ice. See Phil. Tranſ. N° 8. p. 140. See ICE-*Houſe.*

CONSERVE, in *Pharmacy*, &c. a dry confect, or form of medicine, or food, contrived to preſerve the flowers, leaves, roots, peels, or fruits of ſeveral ſimples, as near as poſſible to what they were when freſh-gathered; and to give them an agreeable taſte.

Conſerves are compoſitions of recent vegetable matters and ſugar beaten together into an uniform maſs. Vegetables whoſe virtues are ſoon loſt by drying, may be preſerved in this manner for a conſiderable time unimpaired, the ſugar preventing the natural decompoſition and moulding which would otherwiſe take place.

The preparation of the conſerves is as ſimple as poſſible. The ſugar is firſt ground to fine powder, and then mixed by long beating (not by ſolution) with the vegetable pulp or other material. No heat or other mode of preparation is employed, ſo that the vegetable matter remains as nearly as poſſible in the ſtate in which it exiſted in the plant at the moment of gathering. The conſerves directed by the London college are thoſe of hips, roſes, ſloes, arum and ſquills. Of theſe the two laſt alone can be conſidered as active medicines; and the arum is exhibited with peculiar efficacy in this form, as its pungency to the palate is a little ſheathed, whilſt its internal ſtimulating powers remain unaltered.

The *conſerve of arum*, or cuckow-pint, is a compoſition of arum bruiſed, half a pound, and double refined ſugar, $1\frac{1}{2}$ pound, beaten together in a mortar. Thoſe who hold in veneration the integrity and experience of Sydenham, will have no doubt of the effects of this medicine in rheumatic caſes. This conſerve may be given to adults in doſes of a dram.

The *conſerve of the hip*, or "conſerva cynoſbati," is formed by mixing one pound of hips with 20 ounces, by weight, of double refined ſugar, powdered. This pulp ſhould be ſeparated with great care from the rough prickly matter incloſing the ſeeds; a ſmall quantity of which, retained in the conſerve, is apt to occaſion an uneaſineſs at the ſtomach, a pruritus about the anus, and ſometimes vomiting.

The *conſerve of the ſloe*, "conſerva pruni ſylveſtris," is prepared by putting the ſloes in water upon the fire, that they may ſoften, taking care that they do not burſt; then taking them out of the water, preſſing out the pulp, and mixing it with three times its weight of double refined ſugar.

The *conſerve of ſquills*, "conſerva ſcillæ," is made by beating together in a mortar one ounce by weight of freſh ſquill with five ounces by weight of double refined ſugar. This conſerve is directed to be prepared in a ſmall quantity, in order to guard againſt its variation in ſtrength. It may be given to adults, from half a dram to two ſcruples, or more; eſpecially when freſh.

For the *conſerve of ſea-worm-wood*, the outer rind of the *Seville orange*, *wood-ſorrel*, and of the *red roſe;* pluck the leaves from the foot-ſtalks, and the unblown petals from the calyx, cutting off the heels: take off the outer rind of the oranges with a grater: when you have thus prepared them, bruiſe them with a wooden peſtle in a marble mortar; and then beat them up with three times their weight of double-refined ſugar, until they are mixed. The ſugar ſhould be powdered by itſelf, and paſſed through a ſieve, before it is mixed with the vegetable maſs; otherwiſe it cannot be properly incorporated. Roſe buds, and ſome other vegetables, are uſually prepared for mixing with ſugar by a ſmall wooden mill, contrived for that purpoſe. All the conſerves are to be kept in cloſe veſſels, eſpecially thoſe of arum and ſquill.

With regard to fruits, as currants, &c. they ſet them on the fire to make them yield their juice, then drain and ſtrain them, and thicken what comes from them over the fire, and add to it the ſugar. This laſt ſort of conſerve is particularly called a *jelly;* which ſee.

CONSERVES, Fr. in *Military Language.* See COUNTER-GUARD, or *contre-garde*, the names by which this work is uſually and beſt known.

CONSET'S BAY, in *Geography*, a bay on the N.E. coaſt of the iſland of Barbadoes, N. of Conſet's point, which is a cape, 10 miles N.E. of Bridge-town.

CONSETTI, ANTONIO, in *Biography*, an hiſtorical painter, native of Modena, where he enjoyed conſiderable reputation, in the laſt century. He was born in the year 1686, and is ſaid to have been ſucceſſively the diſciple of his countrymen Franceſco Stringa, and Donato Creti of Bologna, from whoſe precepts and example he acquired a correct ſtyle of drawing, and facility of compoſing. Unfortunately, however, his colouring is deſtitute of thoſe charms of union and ſoftneſs, which captivate the eye at firſt ſight. The principal part of the life of this artiſt was ſpent in the ſtate of Modena, where his pictures are by no means uncommon, and where he died in 1766. Lanzi. Storia Pittorica.

CONSIDERATIO CURIÆ, in *Law*, terms often occurring in law proceedings, and where matters are determined by the court. "Ideo conſideratum eſt per curiam," *i. e.* therefore it is conſidered and adjudged by the court. *Conſideratio curiæ*, &c. denotes the judgment of the court.

CONSIDERATION, the material cauſe, or *quid pro quo*, of any contract, and without which no contract is obligatory or binding.

This conſideration is either *expreſſed*; as if a man bargain to give ten guineas for a horſe, or to ſell his land for a certain ſum, or to grant it in exchange for other lands, &c.; or when a perſon agrees for a ſtipulated ſum to do a thing: or *implied*, when the law itſelf enforces a conſideration; as if a man coming into an inn, take meat, drink, and lodging for himſelf and horſe, the law preſumes he intends to pay for them, though there be no expreſs contract between him and his hoſt: and if he diſcharge not the houſe, the hoſt may ſtop his horſe.

Conſiderations may be regarded either as pertaining to *contracts* generally, or to *deeds* in particular. As to *contracts*, conſideration may be defined to be the reaſon which moves the contracting party to enter into the contract. The civilians hold, that in all contracts, either expreſs or implied, there muſt be ſomething given in exchange, or ſomething that is mutual or reciprocal. This thing, which is the price or motive of the contract, is called the conſideration; and it muſt be a thing lawful in itſelf, or elſe the contract is void. A *good* conſideration is that of blood or natural affection between near relations; the ſatisfaction accruing from which the law eſteems an equivalent for whatever benefit may move from one relation to another. (3 Rep. 83. 1 Inſt. 271. 1 Rep. 176.) This conſideration may ſometimes, however, be ſet aſide, and the contract become void, when it tends in its conſequences to defraud creditors or other third perſons of their juſt rights. But a contract for any *valuable* conſideration, as for marriage, for money for work done, or for other reciprocal conſiderations, can never be impeached at law; and, if it be of a ſufficient adequate value, is never ſet aſide in equity: for the perſon contracted with has then given an equivalent in recompence, and is therefore as much an owner, or a creditor, as any other perſon. Theſe valuable conſiderations are divided by the civilians into four ſpecies. 1. *Do, ut des;* as when I give money or goods on a contract to receive in return money or goods: of this kind are all loans of money upon bond, or promiſe of repayment, and all ſales of goods, in which there is an expreſs contract to pay ſo much for them, or elſe the law implies a contract to pay as much as they are worth. 2. *Facio, ut facias;* as when I agree with a man to do his work for him, provided that he will do mine for me; or if two perſons agree to intermarry; or to do any other poſitive acts on both ſides: or, to forbear on one ſide on conſideration of ſomething done on the other, as that in conſideration A, the tenant, will repair his houſe, B, the landlord, will not ſue him for waſte: or, for mutual forbearance on both ſides. 3. *Facio, ut des;* as, when a man agrees to perform any thing for a price, either ſpecifically mentioned, or left to the determination of the law to ſet a value on it. Thus, when a ſervant hires himſelf to his maſter for agreed wages, he contracts to ſerve his maſter for that ſpecific ſum: or, otherwiſe, if he be hired generally, he is under an implied contract to perform this ſervice for its reaſonable worth. 4. *Do, ut facias;* as, when I agree with a ſervant to give him ſuch wages upon his performing ſuch work, which is the laſt ſpecies inverted; for *ſervus facit, ut herus det,* and *herus dat, ut ſervus faciet.*

A conſideration of ſome ſort or other is ſo abſolutely neceſſary to the forming of a contract, that a *nudum pactum*, or agreement to do or pay any thing on one ſide, without any compenſation on the other, is totally void in law; and a man cannot be compelled to perform it. (Dr. and Stud. l. 2. c. 24.) Thus, if one man promiſes to give another 100 *l.*, nothing is contracted for or given on the one ſide, and therefore nothing is binding on the other. And, however a man may or may not be bound to perform it, in honour or conſcience, which the municipal laws do not decide; thoſe laws will certainly not compel the execution of what he had no viſible inducement to engage for; and, therefore, our law has adopted the maxim of the civil law, that "ex nudo pacto non oritur actio." But any degree of reciprocity will prevent the pact from being nude; nay, if even the thing be founded on a prior moral obligation (as a promiſe to pay a juſt debt, though barred by the ſtatute of limitations), it is no longer *nudum pactum*. And as this rule was principally eſtabliſhed to avoid the inconvenience that would ariſe from ſetting up mere verbal promiſes, for which no good reaſon could be aſſigned, it therefore does not hold in ſome caſes, where ſuch promiſe is authentically proved by written documents. For if a man enters into a voluntary bond, or gives a promiſſory note, he ſhall not be allowed to aver the want of a conſideration in order to evade the payment; for every bond from the ſolemnity of the inſtrument, and every note from the ſubſcription of the drawer, carries with it an internal evidence of a good conſideration. Courts of juſtice will therefore ſupport them both, as againſt the contractor himſelf; but not to the prejudice of creditors or ſtrangers to the contract. Plowd. 308, 309. Hard. 4. 1 Ch. Rep. 157. Ld. Raym. 760. Fonblanque, Treat. Eq. 334. *n.*). See CONTRACT.

With regard to *deeds*, it may be obſerved, that they muſt be founded upon good and ſufficient conſideration; not upon an uſurious contract (ſtat. 13 Eliz. c. 8.); nor upon fraud or colluſion, either to deceive purchaſers *bona fide* (ſtat. 27 Eliz. c. 4.), or juſt and lawful creditors (ſtat. 13 Eliz. c. 5.); any of which bad conſiderations will vacate the deeds, and ſubject ſuch perſons as put the ſame in uſe, to forfeitures, and often to impriſonment. A deed alſo, or other grant made without any conſideration, is, as it were, of no effect; for it is conſtrued to enure or to be effectual, only to the uſe of the grantor himſelf. (Park. § 533.). The conſideration may be either a *good* or a *valuable* one. A good conſideration is ſuch as that of blood, or of natural love and affection, when a man grants an eſtate to a near relation; being founded on motives of generoſity, prudence, and natural duty. A valuable conſideration is ſuch as money, marriage, or the like, which the law eſteems an equivalent given for the grant (3 Rep. 83.); and is therefore founded in motives of juſtice. Deeds made upon good conſideration only, are conſidered as merely voluntary, and are frequently ſet aſide in favour of creditors, and *bona fide* purchaſers. See DEED.

A mere voluntary curteſy will not be a good conſideration of a promiſe; but the value and proportion of the conſideration is not material for maintaining an action, whether it be a penny or 100 *l.*; but a jury will give damages proportionable to the loſs. (Hob. 5. 10 Rep. 76.) A conſideration that is void in part, is void in the whole; and if two conſiderations be alleged, and one of them is found falſe by the jury, the action fails. (Hob. 126. Cro. Eliz. 848.) But if there be a double conſideration for the grounding of a promiſe, for the breach of which an action is brought; though one of the conſiderations be not good, yet if the other be good, and the promiſe broken, the action will lie upon that breach; for one conſideration is ſufficient to ſupport the promiſe. (1 Lill. 297.) A conſideration muſt be lawful, to ground an *aſſumpſit.* (2 Lev. 161.) Where conſiderations are valuable, and conſiſt of two or more parts, there the performance of every part ought to be ſhewn. (Cro. Eliz. 579.) In caſe a deed of feoffment be made of lands, or a fine and recovery be paſſed, and no conſideration is expreſſed in the deed, &c. for the doing thereof, it ſhall be intended by the law, that it was made in truſt for the uſe of the feoffer or conuſor; for it ſhall be preſumed he would not part with his land without a conſideration; and yet the deed ſhall be conſtrued to operate ſomething, and that which is moſt reaſonable. (4 Lill. Abr. 299.) Blackſt. Com. vol. ii. Jacob's Law Dict. by Tomlins.

CONSIGLIONE, in *Geography*, a town of the iſland of Sicily, in the valley of Mazar; 19 miles S. of Palermo.

CONSIGNE, Fr. parole or counter-ſign. When uſed in the maſculine gender, it alſo means a perſon formerly paid by the French government for reſiding conſtantly in a garriſoned town in order to take cognizance of all perſons that entered by the gates or went out of them. He had a place allotted to him, and regularly delivered a report to the governor or commandant of the place.

CONSIGNÉ. A perſon who could not paſs the poſt, or quit the houſe, to which the order of his ſuperior had conſigned him.

CONSIGNMENT, or **CONSIGNATION**, the depoſiting any ſum of money, bills, papers or commodities, in ſure hands; either by order of a court of juſtice, in order to their being delivered to the perſons to whom they are adjudged; or voluntarily, in order to their being remitted to the perſons they belong to, or ſent to the places they are deſtined for.

CONSIGNMENT *of goods*, is the delivering or making them over to another. Thus goods are ſaid to be conſigned to a factor, when they are ſent to him to be ſold, &c. or when a factor ſends back goods to his principal, they are ſaid to be conſigned to him.

CONSILINUM, in *Ancient Geography*, a town of Italy, in a gulf between Brutium and Zephyrium, according to P. Mela. Frontinus ſays, that it was a Roman colony, and places it in Lucania.

CONSILIUM, *dies conſilii*, in *Law*, was a time allowed for the accuſed to make his defence, and to anſwer the charge of the accuſer. It is now uſed for a ſpeedy day appointed to argue a demurrer; which the court grants after a demurrer joined, on reading the record of the cauſe. See IMPARLANCE.

CONSIMILI CASU. See CASU.

CONSISTENCE, a ſtate of reſt, wherein things capable of growth or decreaſe, continue for ſome time at a ſtand, without either.

This term is particularly uſed with regard to trees, for the time, or age, beyond which they do not grow, and yet at which they do not decline.

Thus we diſtinguiſh three ſtates or ſtages of a tree; its growth, conſiſtence, and return: and theſe are common to all trees, even fruit trees.

The conſiſtence of an oak is from fifty to a hundred and ſixty years: ſome, however, hold, that their conſiſtence only commences from a hundred years; aſſerting that they grow till that time, and that they continue in that ſtate of perfection to two hundred years of age.

CONSISTENCE, in *Phyſics*, is that ſtate of a body wherein its component particles are ſo connected, or entangled among themſelves, as not to ſeparate or recede from each other.

Conſiſtence only differs from continuity in this, that conſiſtence implies a regard to motion or reſt, which continuity does not; it being ſufficient to denominate a thing continuous, that its parts are contiguous to each other.

When uſed relative to a diſeaſe, it imports the criſis or acme thereof: when applied to the humours, excrements, or excretions, it imports their ſtate as to thickneſs or thinneſs.

CONSISTENCE is particularly uſed with regard to bodies conſidered as they are more ſoft, or more hard, more liquid, or more dry.

Forms of medicines, as electuaries, lambatives, boluſes, ſyrups, unguents, &c. differ chiefly in conſiſtence.

Not only the gratefulneſs, but alſo the operation, of medicines, depend in ſome meaſure on their conſiſtence; for medicines of a thick conſiſtence are taken into the ſtomach, and penetrate into the body with greater difficulty than ſuch as are thin and liquid; and it requires more trouble to ſwallow a thick than a thin medicine: for this reaſon thick medicines are generally nauſeous and ungrateful; and this is the reaſon why cathartic boluſes are often diſſolved in ſome agreeable liquor, ſince in this form they are more grateful than in any other: for this reaſon alſo apozems are generally clarified by whites of eggs, or a ſtrainer.

On the contrary, a thick conſiſtence is on ſome occaſions more to be deſired; in ulcers of the aſpera arteria, and œſophagus, for inſtance, where we muſt give medicines made up with gum tragacanth, or other ſubſtances of a like nature, which by their viſcidity fix the medicines, as it were, longer to the part affected.

CONSISTENT *Bodies*, is a term uſed by Mr. Boyle, for ſuch as we ordinarily call *firm*, or *fixt bodies*; in oppoſition to *fluid* ones.

That author has a particular eſſay on the *atmoſphere of conſiſtent bodies*; wherein he ſhews, that all, even ſolid, hard, ponderous and fixed bodies, do exhale or emit effluvia to a certain ſpace all around them.

CONSISTENTES, in *Church Hiſtory*, a kind of penitents who were allowed to aſſiſt at prayers, but could not be admitted to receive the ſacrament.

CONSISTORIAL *Advocate*. See ADVOCATE.

CONSISTORY, or *Roman* CONSISTORY, denotes the college of cardinals: or the pope's ſenate, and council, before whom judiciary cauſes are pleaded.

Du-Cange derives the word from *conſiſtorium*; i. e. *locus ubi conſiſtitur*; uſed chiefly for a veſtible, gallery, or antechamber, where the courtiers wait for admiſſion; and called *a conſiſtente multitudine*.

The conſiſtory is the firſt court, or tribunal of Rome: it never meets but when the pope pleaſes to convoke it: the pope preſides in it in perſon, mounted on a magnificent throne, and habited in his *pontificalia*; on the right are the cardinal biſhops and prieſts, and on the left the cardinal deacons.

The place where it is held, is a large hall in the apoſtolical palace, where princes and ambaſſadors of kings are received. The other prelates, prothonotaries, auditors of the rota, and other officers, are ſeated on the ſteps of the throne: the courtiers ſit on the ground; ambaſſadors on the right, and conſiſtorial and fiſcal advocates behind the cardinals.

Beſides the public conſiſtory, there is alſo a private one, held in a retired chamber, called the chamber of *papegay*; the pope's throne here being only raiſed two ſteps high.

Nobody is here admitted but the cardinals, whoſe opinions are collected, and called *ſentences*. Here are firſt propoſed and paſſed all bulls for biſhoprics, abbeys, &c. Hence biſhoprics, and abbeys, are ſaid to be conſiſtorial benefices; in regard, they muſt be propoſed in the conſiſtory, the annates be paid to the pope, and his bulls taken.

Anciently they were elective; but by the concordat, which aboliſhes elections, they are appointed to be collated by the pope alone, on the nomination of the prince.

CONSISTORY was alſo the name of a court under Conſtantine, where he ſat in perſon, and heard cauſes: the members of this court were called *comites*.

CONSISTORY is alſo uſed among the reformed, for a council or aſſembly of miniſters and elders, to regulate their affairs, diſcipline, &c.

CONSISTORY, or *Court Chriſtian*, in the *Engliſh Laws*, is a council of eccleſiaſtical perſons, or the place of juſtice in an eccleſiaſtical or ſpiritual court.

Every archbiſhop and biſhop has a conſiſtory-court, held, before his chancellor or commiſſary, who is the judge, and ſuppoſed to be ſkilled in the civil and canon law, either in his cathedral, or in ſome other convenient place of his dioceſe, for eccleſiaſtical cauſes, ariſing within their reſpective dioceſes. In places of the dioceſe, far diſtant from the biſhop's conſiſtory, the biſhop appoints a commiſſary, *commiſſarius foraneus*, to judge in all cauſes within a certain diſtrict, and regiſter to enter his decrees, &c. (2 Rol. Abr. 286. Seld. Hiſt. Tithes, 413, 414.) The ſpiritual court was anciently, in the time of the Saxons, joined with the county or hundred court; and the original of the conſiſtory court, as divided from thoſe courts, is found in a law of the Conqueror, quoted by lord Coke.

From this court there lies an appeal to the archbiſhop of each province reſpectively, by virtue of ſtat. 24 Hen. VIII. c. 12.

CONSOLATION, one of the places in *Rhetoric*, wherein the orator endeavours to abate and moderate the grief or concern of another.

In conſolation, a principal regard is to be had to the circumſtances and relations of the parties. Scaliger conſiders this exceeding well, De Arte Poetica. "The conſolator, ſays he, is either a ſuperior, an inferior, or an equal; with regard, either to preferment, honour, wealth, wiſdom, or age. Livia is therefore to comfort Ovid, in a manner very different from that wherein Ovid comforts Livia. Thus, as to authority, a father and ſon, Cicero and Pompey, are to conduct their conſolations very differently: ſo in wealth; as if a client ſhould undertake to comfort Craſſus: in wiſdom; as when Seneca comforts Polybius and his mother: as to age, there need no examples."

"A ſuperior may interpoſe his authority, and may even chide; a wiſe man may even diſpute; ſentences will become him. An inferior is to ſhew reſpect and affection, and own he had this from ſome wiſe or learned perſon: an equal to appeal to their common friendſhip."

CONSOLE, in *Architecture*, a bracket or projecting body commonly in the ſhape of the letter S, which is uſed to ſupport a cornice, vaſe, buſt, ſtatue, or even a column, as in the barbarous architecture of the Diocletian palace at Spalatro. Corbel is eſſentially the ſame thing as conſole, but is generally confined to the deſcription of Gothic building.

CONSOLIDA, in *Botany*, Major; Bauh. Pin. See Symphytum *officinale*.

Consolida *media*; Bauh. Pin. See Ajuga.

Consolida *paluſtris*; Taber. See Senecio *paluſtris*.

Consolida *regalis*; Bauh. Pin. Taber. Mons. See Delphinium.

CONSOLIDATION, in *Law*, the combining and uniting of two benefices into one; ſtat. 37 Hen. VIII. cap. 21. which union is to be by the aſſent of the ordinary, patron, incumbent, &c. and to be of ſmall churches lying near together.

The term is borrowed from the civil law; where it properly ſignifies an union of the poſſeſſion, or occupation, with the property. Thus, if a man hath by legacy *uſufructum fundi*, and afterwards buys the property, or fee-ſimple, of the heir; this is called a conſolidation.

Consolidation, in *Surgery*, is the proceſs of nature, by which a ſolution of continuity is united, either in a ſoft or hard part of the body; and, as this proceſs was formerly ſuppoſed to be within the controul of ſurgeons, the remedial applications employed for that purpoſe were denominated *conſolidating medicines*, or *ſarcotics*. Of this kind were the different balſamic and reſinous unguents, with all the ſtimulating compoſitions containing turpentine. The ſurgeon may certainly vary the ingredients of his dreſſings in ſuch a manner as to change the ſurface of a ſore, and, in many caſes, ſo as to occaſion a healing proceſs; but, after all, he acts only as the hand-maid of nature, and is unable to advance one ſtep towards the conſolidation of a wound, unleſs there be a previous tendency in the part to heal.

Warm ſtimulating applications will indeed cauſe a flow of blood to the part whereon they are applied; and by exciting the healthy action of blood-veſſels, as well as by increaſing the ſenſibility of the ſkin or adjacent ulcerated ſurface, they may promote ſuppuration, and even contribute to effect a cure, where it ſeemed unlikely before. In this ſenſe of the term, therefore, we may admit the exiſtence of conſolidating remedies.

CONSONANCE, in *Grammar*, denotes a like cadence, or cloſe of words, periods, &c.

Conſonances are ordinarily faults in diſcourſe, eſpecially in Engliſh proſe: though the ancients make a figure of them, which they call ὁμοιοτέλευτον. Too great a conſonancy in the rhymes has always an ill-effect.

Consonance, in *Muſic*, ſignifies the union or agreement of two ſounds produced at the ſame time, and in this ſenſe, it includes all ſorts of muſical intervals, which naturally divide themſelves into three kinds, *viz.* 1ſt. Concords, or ſuch as produce an agreeable and pleaſing effect upon the ear; ſee that article. 2d. Imperfect or tempered concords, which are intervals nearly related to concords in reſpect to their poſition in the ſcale, as explained when we were treating of perfect concords, and alſo in partaking ſomewhat of the pleaſing effect of the concords to which they belong, when not too much tempered; theſe are alſo further diſtinguiſhed by the phenomena of Beats, ſee that article; and Imperfect *Concords*: and 3d. Diſcords, which are intervals that have a grating or diſagreeable jarring effect upon the ear, or ſometime a fluttering roughneſs when nearly equal to an imperfect concord, or to certain intervals in the ſcale, as the tones major and minor, the tritone, ſemidiapente, and others, as mentioned in relating Dr. Robiſon's experiments upon the concords. See Discord and Flutter. Conſonance, conſidered as ſignifying a ſound ariſing from ſeveral others ſounding together, whether agreeable or diſagreeable to the ear, may be divided into *concord* and *diſcord*. On this principle, Dr. Holder defines *conſonancy*, "A paſſage of ſeveral tunable ſounds through the medium, frequently mixing and uniting in their undulated motions, cauſed by the well-proportioned commenſurate vibrations of the ſonorous bodies, and conſequently arriving ſmooth and ſweet, and pleaſant to the ear; as, on the contrary, *diſſonancy*, he maintains to ariſe from diſproportionate motions of ſounds, not mixing, but jarring and claſhing as they paſs, and arriving in the ear grating and offenſive."

This notion of a conſonance exactly quadrates with that we have already laid down for a *concord*. Accordingly, moſt authors confound the two together; though ſome of the more accurate diſtinguiſh them; making conſonance to be what the word implies, a mere *ſounding of two or more notes together*, or *in the ſame time*; in contradiſtinction to the motion of thoſe ſounds *in ſucceſſion*, or one after the other.

In effect, the two notions coincide; for two notes, thus played in conſonance, conſtitute a concord; and two notes that pleaſe the ear in conſonance, will likewiſe pleaſe it in ſucceſſion. Notes in conſonance conſtitute harmony, as notes in ſucceſſion conſtitute *melody*.

In the popular ſenſe, conſonances are either *ſimple* or *compound*, &c. The moſt perfect conſonance is uniſon; though many, both among the ancients and moderns, diſcard it from the number of conſonances; as conceiving conſonance an agreeable mixture of different ſounds, grave and acute; not a repetition of the ſame ſound.

The ſecond conſonance is the octave; then the fifth, the fourth, the thirds, and the ſixths: the reſt are multiples, or repetitions of theſe.

Conſonance is ſometimes uſed by writers in the ſame ſenſe with concord, and thus, ſuch are ſaid to be variable, and the term imperfect is prefixed when applied to intervals which have a major and a minor of *the ſame name*, as thirds and ſixth, and perfect when applied to concords which never change their name, as the fifth, fourth, and octave; the abſurdity of this uſe of the words perfect and imperfect is ſo apparent, that we wiſh to ſee them diſuſed, and diſcountenanced in elementary books on muſic, in order that theſe terms may excluſively apply to intervals correctly tuned or perfect in reſpect of their accordance, or the reverſe: there was an impropriety in originally aſſigning one name to the thirds and to the ſixth, which naturally have no nearer relation to each other, than the fourth and fifth, or octave and uniſon, or even ſo much; but theſe being eſtabliſhed in uſe, may ſafely remain, without our continuing to confound and reverſe all ideas of perfection and imperfection, in conſequence only of this defect in the muſical nomenclature.

Conſonances are ſaid, by Dr. Smith, (Harmonics, p. 19.) to be *pure,* where none of the equal times between the pulſes of the acuter ſound are ſubdivided by any intermediate pulſe of the graver; and *interrupted* when any of thoſe equal times are interrupted by one or more pulſes of the graver ſound. See Cycle.

CONSONANT, in *Grammar*, a letter which cannot be perfectly ſounded by itſelf; but joined with a vowel, forms an articulate ſound, by a particular motion or contact of the parts of the mouth: and hence the name *con-ſonant,* q. d. *quæ ſonant cum alia.*

A conſonant, conſidering it philoſophically, is nothing elſe but the modification of a ſound, produced by means of the organs of the voice, not a production of ſound itſelf: thus, v. gr. the ſounds ſignified by the characters, *a, e, i, o, u,* &c. are differently modified when we ſay *ab*, than when we ſay *ac* or *ca, ad* or *da*; and thoſe modifications are called *conſonants.*

Accordingly, Dr. Wilkins (Eſſay towards a real Character, p. 366.) defines conſonants to be thoſe letters, in the pronouncing of which the breath is intercepted, by ſome colliſion or cloſure, among the inſtruments of ſpeech: and for this reaſon, he ſays, they are ſtyled "*clauſæ literæ,*" in contradiſtinction to vowels, which are "*apertæ.*" See Vowel.

Conſonants are divided into *ſingle,* as *b, m, q,* &c. and *double,* as *x* in *axillary,* correſponding to the *ξ* of the Greeks.

Conſonants have been alſo divided into *mutes* and *ſemi-vowels.* The mutes are ſuch as cannot be ſounded *at all* without a vowel, and all of which begin their ſound with a conſonant; as *b, d, g, k, p, q, t,* and *c* hard, being expreſſed *be, de, te,* &c. The ſemi-vowels have of themſelves an imperfect ſound, and all begin with a vowel; as *l, m, n, r, f, s,* &c, being ſounded *ef, el, em,* &c. Four of theſe, viz. *l, m, n, r,* are diſtinguiſhed by the name of *liquids,* from their readily uniting with other conſonants, and flowing, as it were, into their ſounds. The mutes, as ſome writers have deſcribed them, are thoſe conſonants whoſe ſounds cannot be protracted; and the ſemi-vowels are thoſe whoſe ſounds can be continued at pleaſure, partaking of the nature of vowels, from which they derive their name. The mutes may again be ſubdivided into *pure,* being thoſe whoſe ſounds cannot be at all prolonged, as *k, p, t*; and *impure,* whoſe ſounds may be continued for a ſhort time, as *b, d, g.* The ſemi-vowels may be ſubdivided into *vocal* and *aſpirated:* the former being formed by the voice, and the latter by the breath. The vocal, which are eleven, are *l, m, n, r, v, w, y, z, th* flat, *zh, ng*; and the aſpirated, five in number, are *f, h, ſ, th* ſharp, *ſh.* The vocal ſemi-vowels may be ſubdivided into *pure,* which are formed entirely by the voice, and *impure,* which are ſuch as have a mixture of breath with the voice. Of the pure there are ſeven, viz. *l, m, n, r, w, y, ng*; and four of the impure, viz. *v, z, th* flat, *zh.* The popular writer, whoſe "Grammar" we are now citing, has given the following liſt, exhibiting the ſounds of the conſonants, which are twenty-two in number.

b	*as heard in*	bay, tub.
d	——	day, ſad.
f	——	off, for.
v	——	van, love.
g	——	egg, go.
h	——	hot.
k	——	kill, oak.
l	——	lap, all.
m	——	my, mum.
n	——	no, on.
p	——	pit, map.
r	——	rat, far.
ſ	——	ſo, leſs.
z	——	zed, buzz.
t	——	to, mat.
w	——	wo.
y	——	ye.
ng	——	ing.
ſh	——	ſhy, aſh.
th	——	thin.
th	——	then.
zh	——	viſion.

Mr. Murray adds, that ſeveral letters marked in the Engliſh alphabet, as conſonants, are either ſuperfluous, or repreſent, not ſimple, but complex ſounds. C, *e. g.* is ſuperfluous in both its ſounds; the one being expreſſed by *k,* and the other by *ſ.* G, in the ſoft pronunciation, is not a ſimple but a complex ſound; as *age* is pronounced *adge.* *J* is unneceſſary, becauſe its ſound, and that of the ſoft *g,* are in our language the ſame. Q, with its attendant *u,* is either complex, and reſolvable into *kw,* as in *quality*; or unneceſſary, becauſe its ſound is the ſame with *k,* as in *opaque.* X is compounded of *gs,* as in *example,* or of *ks,* as in *expect.* See Murray's Engliſh Grammar, p. 4, &c. ed. 8.

Dr. Wilkins (ubi ſupra) diſapproves of the common diviſion of conſonants into *ſemi-vowels* and *mutes*; and prefers the diſtribution of them into three kinds, *viz.* ſpiritous or breathed, ſemi-ſpiritous or half-breathed, and non-ſpiritous or breathleſs. By the former he means ſuch conſonants as require to the framing of them a more ſtrong emiſſion of the breath, either through the noſe or mouth; and he diſtinguiſhes thoſe that are formed by expiration through the noſe into ſonorous, as *m, n, ng,* and mute, as *hm, hn,* and *hng:* the ſonorous being ſuch as require ſome vocal ſound for framing them, and the mutes being other letters of the ſame configuration, pronounced by a ſtrong emiſſion of the breath, without any vocal ſound. The ſpiritous conſonants that are formed by breathing through the mouth are alſo of two kinds, *viz.* ſonorous, as *v, dh, l, r, z, zh*; and mute, as *f, th, hl, hr, ſ,* and *ſh.*

Semi-ſpiritous or half-breathed conſonants are ſuch as are accompanied with ſome kind of vocal murmur, as *b, d, g*; whereas thoſe are denominated non-ſpiritous or breathleſs which are wholly mute, as *p, t, c.* Thus, *b* and *p* are framed when the breath is intercepted by the cloſure of the lips; the firſt of them being more ſoft, with ſome kind of murmur; the other more hard, and wholly mute. Again, *d* and *t* are commonly framed by an appulſe or colliſion of the top of the tongue againſt the teeth or upper gums; the firſt being more ſoft and gentle, with ſome kind of murmur; the other wholly mute. Moreover, *g* and *c* are framed more inwardly, by an interception of the breath towards the throat by the middle or root of the tongue, with ſuch a kind of difference between them as ſubſiſts in the two former caſes. The conſonants already enumerated belong to the claſs of thoſe that are ſimple; but thoſe that are called compound are uſually diſtinguiſhed into ſuch as are aſpirated, and ſuch as are double: the former ſeem to be blended with *h*, and are uſually ſo written; and the latter are compounded of ſome of the other letters, but for the ſake of diſpatch and brevity in writing, they are in ſeveral languages expreſſed by ſingle characters, and reckoned in the alphabet as if they were diſtinct ſpecies of ſimple letters: ſuch in the Latin alphabet are *q* and *x*, and the double letter *z*, whoſe power is the ſame as *ds* or *ts*. The conſonant *q* is allowed to be a compound of *c* and *u*; but what is the true original of *j* conſonant, and that power attributed to *ch* in the words *charity*, *cheeſe*, &c. have not been ſo well aſcertained. It is plain that neither of them is a ſingle letter, becauſe in the prolation of them we do not end with the ſame ſound with which we began: it ſeems, however, to be plain that *j* conſonant is a compound of *d* and *zh*, and *ch* of *t* and *ſh*. As for the other three conſonants that are reckoned in the common alphabet, *k*, *w*, *y*, Dr. Wilkins thinks them unneceſſary. If *c*, he ſays, be uſed always according to its proper power, *k* muſt be ſuperfluous; and therefore the Welſh, who uſe *c* for only one kind of ſound, have no *k*. And as for the letters *w* and *y*, their power is the ſame with that of the vowels ȣ and ι, as will evidently appear when they are rapidly pronounced before any other vowel by way of diphthong, ſo as to make but one ſyllable, ȣar or war, ſȣim or ſwim, ιes or yes, ιoke or yoke. Upon the whole, Dr. Wilkins enumerates 34 ſimple letters, 8 of which are vowels, and 26 conſonants, beſides 24 diphthongs. See LETTER.

According to ſome writers, the moſt natural diviſion of conſonants is that of the Hebrew grammarians; who have been imitated in this reſpect by the grammarians of other oriental languages: theſe divide the conſonants into five claſſes, with regard to the five principal orders of the voice; which all contribute, it is true, but one more notably than the reſt, to certain modifications, which make five general kinds of conſonants. Each kind, or claſs, comprehends ſeveral conſonants, which reſult from the different degrees of the ſame modification, or from the different motions of the ſame organs.

Theſe organs are the *throat*, *palate*, *tongue*, *teeth*, and *lips*; whence the five claſſes of conſonants are denominated *guttural*, *palatal*, *lingual*, *dental*, and *labial*.

We account ſixteen conſonants in the Engliſh alphabet, viz. *b*, *c*, *d*, *f*, *g*, *k*, *l*, *m*, *n*, *p*, *q*, *r*, *ſ*, *t*, *x*, *z*; to which there are three others to be added, viz. the *h*, and *j* conſonants, and *v* conſonant, which make the whole number of conſonants nineteen: one whereof is guttural, viz. the aſpirate *h*; five palatal, viz. *c*, as when pronounced before *a*, *o*, and *u*, as in *cavern*, *corn*, *curioſity*; *g*, as in *Geneva*; *j* conſonant in *julep*; *k* in *kernel*; and *q* in *query*. To theſe ſome have added *w* and *y*, which are really conſonants when they begin a word or ſyllable; although in every other ſituation they are called vowels. That they are conſonants when uſed as initials ſeems to be evident, from their not admitting the article *an* before them, and from their following a vowel without any hiatus or difficulty of utterance; that in other ſituations they are vowels appears from their regularly taking the ſound of other vowels.

The four *lingual* conſonants are *d*, *l*, *n*, *t*; the four *dental* are *r*, *s*, *x*, *z*, the three laſt whereof are *hiſſers*; and five *labial*, *b*, *f*, *m*, *p*, and *v* conſonant.

With regard to which diviſion it may be obſerved, that though the *g* be modified in three different manners, as it comes before an *a*, an *o*, or an *u*; yet it is ſtill a conſonant of the palate; that the *j* conſonant differs in nothing but its figure from the *g* before *e* or *i*; that *k* has the ſame pronunciation with the *c*; that *x* comprehends the ſound of two letters in its ſound, viz. *c* or *k*, and *ſ* or another *c*, as in *Alexander*, and *Alexis*, which we pronounce as if wrote *Alecſander* and *Aleccis*, or *Alecſis*; and that the *c* before an *e* or *i*, is no conſonant of the palate, becauſe in that caſe it loſes its proper ſound, and aſſumes the hiſſing ſound of the *ſ*.

The abbot Dangeau thinks the nature of the diviſion of the Hebrew grammarians to be very reaſonable; but he does not acquieſce in the diſtribution they have made of them: to find a natural and juſt diviſion of the conſonants, he obſerves, no regard muſt be had to the characters that repreſent them; nor any thing be conſidered but their ſound, or the modification they give the ſound.

On this principle, the ſame author finds in the French five *labial* conſonants, *b*, *p*, *v*, *f*, and *m*; five *palatal* ones, *d*. *f*, *g*, *k*, *n*; four *hiſſers*, *ſ*, *z*, *j*, *ch*; two *liquids*, *l* and *r*; two that run into and mix with each other, as *ll*, and *gn*; which laſt, however, is peculiar to the French language; and the *h* aſpirate.

He adds, 1. That *m* and *n* are properly two naſal conſonants; the *m*, a *b* paſſed through the noſe, and the *n* a *d*, in like manner, pronounced through the noſe; and, in effect; people with a cold pronounce *barket* for *market*, *deed* for *need*, &c.

2. That among the conſonants, ſome are weak, others ſtrong; their difference conſiſting in this, that the former are preceded with a ſmall emiſſion of the voice, which ſoftens them, which the latter have not. The weak are *b*, *c*, *d*, *g*, *z*, *j*; the ſtrong, *p*, *f*, *t*, *k*, *ſ*, *ch*.

It may be here obſerved, that when we ſpeak of a perſon's talking *through the noſe*, it muſt be underſtood in a ſenſe quite different from what the words ſeems naturally to import: ſince the noſe in this caſe concurs leſs to the pronunciation than when we do not ſpeak through the noſe; in regard the air, not being able to make its way through the noſe, is returned into the mouth, where it forms a dull obtuſe ſound, called *naſal*.

From the whole we may conclude, that the exceſs of conſonants in one language above another only conſiſts in this, that there are more modifications of ſound received and eſtabliſhed in the one than in the other: for all men, having the ſame organs, may form the ſame modifications; ſo that it is entirely owing to cuſtom, nothing to nature, that the Engliſh have not the ϑ of the Greeks, the *ain* and *heth* of the Hebrews, the *ch* of the Germans, the *gn* of the French, the *gl* of the Italians, the *ll* of the Welſh, &c.

Alſo, that the Chineſe have no *r*, the Iroquois no labial conſonants, the Hurons have abundance of aſpirates, and the Arabs and Georgians abundance of double conſonants: which laſt is owing to this, that they make ſeveral organs concur ſtrongly and equally to the modification of a ſound; whereas, in the reſt, only one organ is moved very ſtrongly and ſenſibly, and the reſt weakly.

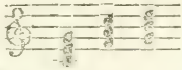
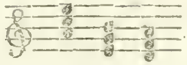
It is hence alſo viſible, that in all languages the aſpirates, or guttural letters, are real conſonants; ſince the throat modifies the ſound as much as the palate, tongue, or lips.

Laſtly, to find all the conſonants that may be formed in any language, there needs nothing but to obſerve all the modifications that the ſounds of ſpeech will admit of, by which we ſhall have all the conſonants practicable.

Dr. Hunter (Edinb. Tranſ. vol. ii.) in his inveſtigation of the manner in which conſonants are formed, diſtinguiſhes them in two different reſpects, viz. by the operation of the breath which is employed to make them audible. There are *five* poſitions, he ſays, by which the vocal ſound is to be articulated: the *firſt* is formed by the cloſe junction of the lips, ſo that no breath is ſuffered to tranſpire, and the juſt modification of this poſition is that called *oral*, when the paſſage of the breath or ſound by the noſe is ſtopped, and thus are formed the letters *p* and *b*; and the ſecond modification, termed the *naſal*, is formed by opening the communication, or exit, by the noſe, and ſuffering the ſound or breath to paſs that way; in which caſe the letter *m* is ſounded. The *ſecond* poſition is formed by the application of the under lip to the fore-teeth of the upper jaw, which do not form an abſolute interruption to the breath, but ſuffer it to paſs in an audible manner, by means of the reſtraint with which it is made to paſs: and then are produced the letters *f* and *v*. The *third* poſition is formed by a ſimilar application of the tongue to the fore-teeth, and a ſimilar expreſſion of the breath; theſe producing the two conſonants θ and *th*. The *fourth* poſition is formed by the application of the point or fore part of the tongue to the root of the ſame teeth, or fore part of the palate, which poſition may be variouſly modified; as by applying the tongue cloſely to the palate, ſo as to form an abſolute interruption of the breath, in a manner ſimilar to that of the firſt poſition, which may be called the *mute* modification, and which ſeems to form the conſonants *t* and *d*. 2. The tongue is not kept cloſely fixed to the palate, but ſuffers the breath to be expreſſed in an audible manner, ſimilar to thoſe of the ſecond and third poſitions: this may be termed the *ſibilating* modification, and is that by which are expreſſed *ſ* and *z*. 3. The paſſage of the breath between the point of the tongue and the palate is opened alternately in a quick and tremulous vibration: this may be denominated the *vibratory* modification, and ſerves to form the letter *r*. 4. The paſſage of the breath or ſound is not interrupted in any degree, but it is made to paſs in a very peculiar manner through the mouth; for this purpoſe the tongue is cloſely applied to the fore part of the palate, but it is retracted on each ſide ſo as to leave an open ſpace, and then a paſſage is preſerved for the breath, which goes under the tongue and out of the mouth: this may be termed the *liquid* modification, and ſerves to form the ſonorous letter *l*. 5. The lateral paſſages opened for the breath in the laſt modification are ſhut, and the ſound at the ſame time is ſuffered to eſcape by the naſal paſſage, as in the ſecond modification of the *firſt* poſition: this may be denominated the *naſal* modification, and produces the letter *n*. The *fifth* poſition is formed in all reſpects like the *fourth*, but only by a different part of the tongue and palate, and has the ſame number of modifications, which correſpond in their nature, and may be denominated in the ſame manner. Thus, the letters *k* and *g* are formed in the *mute* modification; *ſh* and *j* in the *ſibilating;* the guttural or Northumbrian *r* in the *vibratory;* the Spaniſh *ll*, or the French *l mouillée*, in the *liquid;* and the guttural *n* or the Engliſh *ng* in the *naſal* modification. Having thus explained the ſeveral poſitions of the organ, with their different modifications, Dr. Hutton proceeds to illuſtrate the formation of the conſonants, and articulations of voice, by the action of the breath and ſound. In all the poſitions of the articulating organ, he ſays, there is either employed the ſimple aſpiration of the breath, or a ſound produced in the wind-pipe, and modified in the articulating organ. Thus, in all the poſitions, and in ſeveral of their modifications, there are produced two diſtinct articulators, according either as ſound is emitted along with the articulation, or only the breath employed without any other ſound. Hence proceeds the diſtinction of mutes and conſonants among the articulators of voice.

But in each of theſe diſtinctions of mutes and conſonants, it is neceſſary to make a ſub-diſtinction, according as the articulator is either perfect or imperfect, whether as a mute or as a conſonant. Each of theſe, the author explains in the following manner: The perfect mute can only take place in thoſe poſitions in which the breath is abſolutely interrupted by the cloſe or impervious organ; which does not happen in the ſecond and third poſitions, and only in ſome of the modifications of the fourth and fifth. This mute articulator is formed, either by interrupting the vocal ſound with the cloſe poſition, in which caſe it is a final articulator; or by beginning to expreſs the vocal ſound in this cloſe poſition, when it forms, upon opening the paſſage, an initial articulator. Of this kind there are juſt three articulators, correſponding to the three poſitions in which the organ may be abſolutely cloſed, in relation to the exit of the breath: theſe are *p* in the *firſt* poſition, *t* in the *fourth*, and *k* in the *fifth* poſition. The imperfect mute is formed by emitting a guttural ſound, or that of the wind-pipe, in theſe three poſitions of the mute articulator. The ſound here is extremely limited; for it is neceſſarily reſtricted to that quantity of breath which may be expelled through the ſounding wind-pipe in compreſſing the air, or diſtending the cavity of the cloſe organ. Theſe ſhort ſounded articulators may therefore be termed imperfect mutes. The *b*, *d*, and *g*, are the three imperfect mutes, correſponding to the three abſolute mutes, *p*, *t*, and *k*, of the *firſt*, *fourth* and *fifth* poſitions. In the ſibilating articulators of the *ſecond* and *third* poſitions, and of the ſecond modification of the *fourth* and *fifth* poſitions, the breath may be continually emitted, either with the ſimple expiration, or attended with the guttural ſound. This, then, forms two caſes of articulation, differing from each other, and alſo from the other two caſes of mute articulation; ſeeing that in the preſent caſe, whether the conſonant be formed with a guttural ſound, or only an audible aſpiration, it is a continued thing, and is not neceſſarily terminated, as in the mutes, by the cloſe poſition of the organ. Now, as in the caſe of mutes, we have the diſtinction of perfect and imperfect, with regard to that ſpecies of letter, ſo, in the caſe of conſonants, we have a ſpecies which is perfect, and one which is imperfect. The imperfect ſpecies of conſonant-articulators is formed in the four ſibilating poſitions and modifications juſt now mentioned, *viz.* the *f* in the *ſecond* poſition, the θ in the *third* poſition, the *ſ* in the ſibilating modification of the *fourth*, and the *ſh* in that of the *fifth* poſition. To perfect thoſe four conſonants, we have merely to add the guttural ſound to the continued expiration, and we then produce of the *f* the *v*, of the θ the *th*, of the *ſ* the *z*, and of the *ſh* the *j*. We have now only remaining the *naſal* modification of the *firſt* poſition, which gives the conſonant *m;* the *vibratory* modification of the *fourth* and *fifth* poſitions, which give two ſpecies of the letter *r;* the *liquid* modifications, which give two ſpecies of the letter *l;* and the *naſal* modifications of thoſe two laſt poſitions, which give two ſpecies of the letter *n*. In none of all theſe is formed a diſtinct articulator, by means of the ſimple aſpiration; conſequently all theſe are perfect conſonants. Our author obſerves, that the letter *h* is a general articulator, which is formed in many different poſitions of the vocal organ. Diphthongs and conſonant-vowels, or rather articulating vowels, are formed in the following manner: the diphthong, by ſounding both vowels equally in the time of one; the conſonant-vowel again, by an unequal diviſion of this time, or by ſliding quickly from the poſition of the two extreme vowels *i* and *u*, to the vocal ſound which is to be thus articulated. See Vowel.

Consonant, is a term in *Muſic*, which Dr. Callcott in his Muſical Grammar applies to the concords, octave, fifth, fourth, thirds major and minor, and ſixths major and minor. The conſonant triads, or common chords, according to the ſame author are,

in the major mode , and in the minor mode . See Triad.

CONSORT, *Queen*. See Queen.

CONSOUND, in *Botany*. See Symphytum and Solidago.

CONSOW, in *Geography*, a town of Poland, in the palatinate of Sandomirz; 28 miles S.E. of Radom.

CONSPIRACY, in *Law*, is taken for a combination or confederacy to do ſomething evil, or illegal: though in the original ſenſe of the word, and in its uſe in other languages, it ſignifies merely an agreement, whether for good, bad, or matters indifferent.

In our ſtatutes and law books, *conſpiracy*, in a general ſenſe, is frequently confounded with *maintenance*. and *champarty*.

Conspiracy, in its ſpecial ſignification, is uſed for a confederacy of two, at leaſt, falſely to indict one, or procure him to be indicted of felony; who, after acquittal, ſhall have writ of conſpiracy. See 33 Edw. I. ſtat. 2. 7 Hen. V. 18 Hen. VI. c. 12. The term is now commonly uſed for the unlawful combination of journeymen to raiſe their wages, or to refuſe working, except on certain ſtipulated conditions; an offence particularly provided for by ſtat. 2 & 3 Ed. VI. c. 15. reviſed, continued, and confirmed by ſtat. 22 & 23 Car. II. c. 19 (now expired); which enacts, among other things, that "if any artificers do conſpire, that they ſhall not do their work but at a certain price, or ſhall not take upon them to finiſh what another hath begun, or ſhall do but a certain work in a day, or ſhall not work but at certain times, every perſon ſo conſpiring ſhall forfeit for the firſt offence, 10*l.* or be impriſoned 20 days; for the ſecond, 20*l.* or be pilloried; and for the third, 40*l.* or be pilloried, loſe an ear, and become infamous." This ſtatute appears to be yet in force, though it be not frequently reſorted to for remedy in this caſe; the proceeding being uſually by indictment for conſpiracy.

By the common law all conſpirators wrongfully to prejudice a third perſon are highly criminal. 1 Hawk. P. C. c. 72. § 2. ſtat. 5 Eliz. c. 4. Journeymen confederating and refuſing to work unleſs for certain wages, may be indicted for a conſpiracy, although the ſtatutes which regulate their work and wages do not direct this mode of proſecution; for the offence conſiſts in the conſpiring, and not in the refuſal: and all conſpiracies are illegal, though the ſubject-matter of them may be lawful. Thus alſo, a bare conſpiracy to do a lawful act to an unlawful end is a crime, though no act be done in conſequence of it. 8 Mod. 321. The fact of conſpiring need not be proved on the trial, but may be collected by the jury from collateral circumſtances. 1 Black. Rep. 392. Stra. 144. And if the parties concur in doing the act, although they were not previouſly acquainted with each other, it is conſpiracy. 1 Hawk. P. C. c. 72. § 2. Writ of conſpiracy lies for him that is indicted of a treſpaſs, and acquitted, though it was not felony; alſo upon an indictment for a riot. 2 Mod. 306. 5 Mod. 405. Writ of conſpiracy lies where a man is falſely indicted of any crime which may prejudice his fame or reputation; and though it doth not import ſlander, if it endanger his liberty, or the indictment be injurious to his property, &c. 3 Salk. 97.

But though a conſpiracy to charge falſely be indictable, yet the party ought to ſhew himſelf to be innocent; for the writ of conſpiracy doth not lie without an acquittal. Mod. Caſ. 127. 185, 186. Not only writ of conſpiracy, which is a civil action at the ſuit of the party, but alſo action on the caſe in the nature of a writ of conſpiracy, doth lie for a falſe and malicious accuſation of any crime, whether capital or not capital, even of high treaſon; and this, though the bill of indictment be found *ignoramus*, or it does not go ſo far as an indictment. And the ſame damages may be recovered in ſuch action as in a writ of conſpiracy, where the party is lawfully acquitted by verdict. 1 Rol. Abr. 111, 112. 9 Rep. 56. Gilb. Ca. 185. 10 Mod. 148. 214. Salk. 15. An action on the caſe is preferable, as it is more in uſe, and the proceedings more eaſy and not attended with ſuch niceties as the writ of conſpiracy.

If one falſely and maliciouſly procure another to be arreſted, and brought before a juſtice of peace to be examined concerning a felony, &c. on purpoſe to vex and diſgrace him, and put him to charges and trouble, although he is not indicted for the ſame, yet he may have an "action on the caſe;" in which he need not aver that he was lawfully acquitted, as he ought to do in a writ of conſpiracy; but he muſt aver that the accuſation was *falſé et malitioſé*, which words are neceſſary in the declaration; and it muſt appear that there was no ground for it. And as an "action on the caſe" may be proſecuted againſt one perſon, where the writ of conſpiracy or indictment doth not lie but againſt two, this action is moſt commonly brought. 1 Danv. Abr. 208. 213. 2 Inſt. 562. 638.

Conſpirators may be indicted at the ſuit of the king, and at the common law, one may prefer an indictment againſt conſpirators, though nothing be executed: however, the conſpiracy ought to be declared by ſome act, or promiſe to ſtand by one another, &c. But a bare conſpiracy will not maintain a writ of conſpiracy, at the ſuit of the party, becauſe he is not damaged by it; though it is a ground for an indictment. 9 Rep. 56. 2 Roll. Abr. 77. If the defendants can ſhew any foundation or probable cauſe of ſuſpicion, they ſhall be diſcharged: and if a man hath good cauſe of ſuſpicion, that a perſon is guilty of felony, and cauſes him to be indicted, in proſecution of juſtice, action of conſpiracy will not lie; but it is otherwiſe if the proſecutor impoſes the crime of felony, where no crime of felony was committed. 1 Roll. Abr. 115. 4 Rep. 438. Conſpiracies ought to be out of court; for if a proſection be ordered in a courſe of juſtice, and witneſſes appear againſt a party, &c. there ſhall be no puniſhment; and if perſons acted only as jurors in a criminal matter, or judges in open court, there is no ground for proſecution. S. P. c. 173. 12 Rep. 24. If all the defendants but one are acquitted on indictment for conſpiracy, this one muſt be alſo acquitted; becauſe one perſon alone cannot be indicted for this crime: and huſband and wife, being but one perſon, may not be indicted alone for a conſpiracy. 2 Rol. Abr. 708. The acquittal of one perſon is the acquittal of another upon indictment of conſpiracy (3 Mod. 220.) *i. e.* where only two are indicted, and it is not laid or proved that they conſpired with others, unknown. However, where one is found guilty, according to the opinion of lord chief juſtice Hale, if the other doth not come in upon proceſs, or if he dies pending the ſuit, judgment ſhall be had againſt the other. 1 Vent. 234. It hath been reſolved, that if an "action on the caſe" be brought againſt ſeveral perſons, and all but one be acquitted, yet judgment may be given againſt that one only. 1 Hawk. 192. Judgment may be alſo given againſt one only before the trial of the others: and it has been held, that a conſpiracy may be laid without any overt act. 1 Str. 193. Perſons acting ſeparately may be alſo guilty of a conſpiracy; as particularly in the caſe where they are all of a family, *e. g.* huſband, wife, and ſervants. 1 Str. 144.

If the parties are found guilty of conſpiracy, upon an indictment of felony, at the king's ſuit, the judgment anciently was, that they ſhould loſe their "frank-law," (which diſabled them to be put upon any jury, to be ſworn as witneſſes, or to appear in perſon in any of the king's courts,) and that their lands, goods, and chattels ſhould be forfeited into the king's hands, their houſes and lands ſtripped and waſted, their trees rooted up, and their bodies impriſoned. This is commonly called "villainous" judgment, and is given by the common law, and not by any ſtatute, and in ſome books it is ſaid generally to be the proper judgment upon every conviction of conſpiracy at the ſuit of the king, without any reſtriction to ſuch as endangered the life of the party; but this point doth not ſeem to be any where ſettled. 1 Hawk. 193. 2 Inſt. 143. 222. This judgment, however, hath been but ſeldom given; there being no inſtance of it ſince the reign of Edw. III. The uſual mode of puniſhment at preſent is by pillory, fine, impriſonment, and ſurety for good behaviour. Burr. 996. 1027. Str. 196. The quarter ſeſſions have juriſdiction over this offence. Finch. 80. 8 Mod. 321. And on motion in arreſt of judgment, the defendant muſt be perſonally preſent in court. Stra. 1227. Burr. 931.

In caſes where villainous judgment is impoſed, the matter of the conſpiracy ought to touch a man's life. As fine and impriſonment are at this day the uſual puniſhment for conſpiracy, ſo on writ of conſpiracy, &c. the party ſhall be fined, and render damages. 1 Hawk. P. C. 72.

CONSPIRATION, Fr. See Conspiracy.

Conspiration, *contre le ſervice du Roi*, conſpiracy againſt the king's ſervice. Under the old government of France every conſpiracy, colluſive, or unlawful combination or underſtanding againſt the king, his governors, commanders, or other officers, was regarded as a capital military offence; and by an order of the 1ſt July 1727, it was enacted that every perſon convicted of ſuch a crime ſhould be broken on the wheel.

CONSPIRATIONE, in *Law*, a writ that lies againſt *conſpirators*. Reg. Orig. 134. F. N. B. 114.

CONSPIRATORS, according to the ſtatute, are thoſe that do confederate, or bind themſelves by oath, covenant, or other alliance, that every one of them ſhall aid, and bear the other, falſely and maliciouſly, to indict, or cauſe to indict, or falſely to move, or maintain pleas: and ſuch as retain men in the country, with liveries or fees, to maintain their malicious enterprizes: and this extendeth as well to the takers, as the givers: and ſtewards, and bailiffs, of great lords, which, by their office, or power, undertake to bear, or maintain quarrels, pleas, or debates, that concern other parties than ſuch as touch the eſtate of their lords, or themſelves. 33 Edw. I. ſtat. 2. 2 Inſt. fol. 384. 562.

Moreover, againſt conſpirators, falſe informers and embracers of inqueſt, the king hath provided a writ in the chancery; and the juſtices of either bench and juſtices of aſſize, ſhall, on every plaint, award inqueſt thereupon. Stat. 28 Ed. I. ſt. 3. c. 10. There are alſo conſpirators in treaſon, by plotting againſt the government, &c. See Treason.

CONSPIRING Powers, in *Mechanics*, are all ſuch as act in directions not oppoſite to one another. See Power, and Motion.

CONSTABLE. This appellation hath afforded ample matter of diſquiſition to learned antiquarians. Hiſtory has traced it backwards from its introduction to England, through France, Germany, and Greece, to the imperial ſeat at Conſtantinople, in the days of Conſtantine the Great; and if we aſcend farther towards the Eaſt, we ſhall find the term *cône* or *cûne* in Paleſtine, which ſignified in the times of the Old Teſtament, a ſtability, ſtrength, or ſtay. Some trace of this word has been diſcoverable in the appellation of Laocoon at Troy, and particularly in that of Conſtantine, who was himſelf of oriental extraction, having ſprung from Dardania, a country of Upper Mœſia, and ſaid by flatterers to have been deſcended from Dardanus and the Trojans. It is not improbable that this appellation of the emperor might have occaſioned the adoption of the word into the Roman language about the ſame time. For it was at that period that the word *count*, obviouſly deduced from *cone* or *cune*, firſt became a name of dignity; and from thence was tranſmitted weſtwards, with ſome variation, according to the different genius of languages throughout the provinces. Amongſt the Saxons the word was *koning* or *kyninge*, from which, without doubt, we derive our word king. Moreover, the word *ſtole*, *ſtolle*, *ſtaſle*, or *ſtable*, by an eaſy tranſmutation of the ſeveral letters frequent in almoſt all languages, which ſeems to be the other conſtituent of the appellation *conſtable*, is likewiſe common to the languages of the middle ages, and ſignifies a ſtanding place, diviſion, or department, called by the Romans *ſtatio*. According to this etymology, the word *conſtable* ſignifies the ſtability or ſtay of the place, or the ſtrong man of the diviſion. Thoſe who derive it from the Saxon, diſcover conſtable in *koningſtapel*, denoting the ſupport of the king. But others, as ſir Henry Spelman, and Dr. Cowel, conſidering that we borrow the name, as well as the office, from the French, deduce it, with greater probability, from that language; in which it is plainly derived from *comes ſtabuli*, the maſter of the ſtables, or perhaps of the horſe, an officer well known in the empire; ſo called, becauſe, like the great conſtable of France, as well as the lord high conſtable of England, he was to regulate all matters of chivalry, tilts, tournaments, and feats of arms, which were performed on horſeback. Accordingly, they ſuppoſe, that the dignity, which at firſt was civil, in time became military, and the maſter of the ſtables was made general of the army.

Constable *of England, Lord High,* is an ancient officer of the crown, now diſuſed in England, except on ſolemn occaſions, as the king's coronation, and the like. The firſt conſtable of England is ſaid to have been created by the conqueror, who appointed Ralph de Mortimer, one of the principal commanders of his army; and the office continued till the reign of Henry VIII., A. D. 1521; when it became extinct, as the powers annexed to it rendered it troubleſome to the king, by the attainder of the third duke of Buckingham, who derived it from the Bohuns, earls of Hereford, and in whom it was hereditary. Since this time there hath not been any permanent high conſtable; but the office has been kept vacant, except on particular occaſions. About a century after, *viz.* in 1627, it was alſo ſuppreſſed in France, by an edict of Louis XIII.; though the office has been exerciſed in the command of the marſhals, by the firſt officer in the army. See CONNETABLE.

What authority and juriſdiction belonged to the conſtable, we may partly learn from a ſtatute of the 13th of Richard II., in which it is ſaid "that he ought to have cognizance of contracts touching feats of arms and of war out of the realm, and alſo of ſuch things relating to arms or war within the realm, as could not be determined or diſcuſſed by the common law, with other uſages and cuſtoms appertaining to the ſame matters, which other conſtables before that time had duly and reaſonably uſed." Madox (Hiſt. Excheq. c. 11.) ſays, that he was a high officer, both in war and peace. As the duties enjoined on the conſtable and mareſchal or marſhal, as well in war as in peace, in camp and in court, were multifarious, honourable, and confidential; ſo the powers, privileges, authority, and preeminence of thoſe officers, were extenſive, judicial, executory, and reſpectable. The powers and functions of each of theſe two high officers, when acting in their military capacities, were, in ſome inſtances, concurrent; in others, ſeparate and independent. In the diſcharge of ſome official duties, they were upon an equal footing, and the marſhal acted as coadjutor to the conſtable, but in others, the former was ſubordinate and ſubſervient to the latter. The functions of the conſtable, in his civil capacity, were few, and in a great meaſure reſtricted to certain perſonal attendances on the king in his court, on high feſtivals, and on occaſions when ſuch affairs were tranſacted as required pomp and ſolemnity. In his military capacity, the conſtable examined the number and qualifications of thoſe who were ſent by the military tenants, either into the field or garriſon, and alſo of the ſtipendiaries retained by the king, and gave them either their admittance or diſcharge. When the army took the field, and was commanded by the king in perſon, the conſtable acted as his lieutenant, and was next to him in authority; but whenever the king was abſent, the conſtable had the ſupreme and ſole command of the forces. In both caſes, the marſhal was the ſubſtitute or vice-general of the conſtable. See COURT *of Chivalry*, and MARSHAL.

From thoſe mighty magiſtrates, the conſtables of England, are derived the inferior ones, ſince called the *conſtables of hundreds and franchiſes:* theſe were firſt ordained in the thirteenth year of Edward I. by the ſtatute of Wincheſter (13 Ed. I. ſtat. 2. c. 6.); which, for the conſervation of the peace, and view of armour, and for preſenting defaults of armour, and of the ſuits of towns and of highways, &c. appointed, that two conſtables ſhould be choſen in every hundred and franchiſe.

Theſe are what we now call *conſtabularii capitales*, or *high conſtables;* becauſe continuance of time, and increaſe of people, &c. have occaſioned others of like nature, but inferior authority, in every town and pariſh, called *petty conſtables*, or *ſub-conſtabularii*, firſt inſtituted (as ſome ſay) about the reign of Edward III.

Although it has been a prevalent opinion, maintained by Coke, Hale, and others, that high conſtables are not more ancient than the ſtatute of Wincheſter above cited; yet Hawkins concurs with others in maintaining, that both conſtables of hundreds, commonly called high conſtables, and alſo conſtables of tythings, now denominated petty conſtables or tything-men, exiſted by the common law, and were not firſt ordained by the ſtatute of Winton or Wincheſter; for that ſtatute doth not ſay, that ſuch officers ſhall be conſtituted, but evidently ſeems to ſuppoſe that there were ſuch before the making of it. 2 Hawk. 61. That the high conſtable was inſtituted long before the ſtatute of Winton is a fact aſcertained by a writ or mandate of Henry III., preſerved in the Adverſaria to Watts's edition of Matt. Paris, and from which chapters 4 and 6 of the ſtatute of Winton are evidently taken. By this writ it is provided, "that in every hundred there ſhall be *conſtituted* a CHIEF CONSTABLE, at whoſe mandate all thoſe of his hundred, ſworn to arms, ſhould aſſemble and be obſervant to him, for the doing of thoſe things which belong to the conſervation of the king's peace." No mention of this officer, it is believed, can be any where found prior to the date of this inſtrument; which perhaps may no more determine the queſtion as to his original creation than the ſtatute of Winton. As for the "conſtable of the vill," or petty conſtable, as he is frequently called by way of diſtinction from the chief conſtable, this officer has been repeatedly acknowledged to be one of the moſt ancient officers in the realm, for the conſervation of the peace (Poph. 13. 4 Inſt. 265.). It muſt be confeſſed, however, that no mention of him by this identical name is any where found to occur anterior to the writ or mandate of king Henry III. already mentioned; by which it is alſo provided, that in every village or townſhip there ſhould be conſtituted a conſtable or two, according to the number of the inhabitants. But it is partly certain that lord Coke's idea is well founded, and that "this officer is actually owing to the inſtitution of the frank-pledge, uſually attributed to king Alfred," and was in fact originally the ſenior or chief pledge of the tything or *decima*. Hence it appears, that the ordinance of Henry III., far from inſtituting the office, merely enlarged the number of officers, placing them in towns and villages, inſtead of franchiſes; hence it might frequently happen, that a manor of great extent had only a ſingle conſtable for ſeveral townſhips; a caſe exactly ſimilar ſometimes occurring at this day, in which a townſhip, comprehending ſeveral hamlets, equally populous perhaps with itſelf, has only one conſtable for the whole. Upon the whole, it ſeems highly probable, that, at the common law, and before the mandate of Henry III., the conſtable of the hundred and the conſtable of the manor, were officers of the ſame nature and authority, originating at the ſame time and differing only as to the extent of their ſeveral diſtricts; in ſhort, that they bore to each other the ſame analogy as ſubſiſted between the bailiff of the hundred and the bailiff of the manor. Hence it follows, that the conſtable of the hundred neither poſſeſſed nor could have exerciſed any more authority within the precinct of the latter, than the conſtable of one manor poſſeſſed or could have exerciſed in another; the manor being to all intents and purpoſes exempt from, and excluded out of the hundred.

High conſtables are choſen at the court leets of the franchiſe or hundred over which they preſide, or, in default of that, by the juſtices at their quarter ſeſſions, or by the greater number of the juſtices of the diviſion: and they are ſworn at the ſeſſions, or by warrant from the ſeſſions; which courſe hath often been allowed and commended by the juſtices of aſſize. Dalt. c. 28. Salk. 150. And by ſtat. 29 Geo. II. c. 25, §8, 9, in Weſtminſter a high conſtable is to be elected annually by the dean or high ſteward or his deputy at a court leet. But by 1 Geo. ſtat. 2. c. 13. high conſtables are required to take the oaths of allegiance, ſupremacy, and abjuration, as other perſons who qualify for offices; but they are not within the ſtatute of the 25 C. II. c. 2. as to receiving the ſacrament and ſubſcribing the declaration againſt tranſubſtantiation; and petty conſtables are exempted both from the one and from the other. The petty conſtables have two offices united in them; the one ancient, the other modern. Their ancient office is that of *Head*-BOROUGH (which ſee), tything-man, or borſholder, who are as ancient as the time of Alfred; and their more modern office is that of conſtable merely, which was appointed (as it has been ſaid) ſo lately as the reign of Edward III., in order to aſſiſt the high conſtable. And, in general, the ancient head-boroughs, tything-men, and borſholders, were made uſe of to ſerve as petty conſtables; though not ſo generally, but that in many places they ſtill continue diſtinct officers from the conſtable.

The common law requires, that every conſtable ſhould be *idoneus homo*, i. e. apt and fit to execute the ſaid office; and in law he is ſaid to be *idoneus* when he poſſeſſes three qualifications, *viz.* honeſty, knowledge, and ability, (8 Rep. 41. *b.*) And if one be elected conſtable, who is not *idoneus*, he by the law may be diſcharged of his office, and another who is *idoneus* appointed in his place. He muſt alſo be an inhabitant of the place for which he is choſen, (12 Mod. 256.) nor ſhould he be the keeper of a public-houſe, (6 Mod. 42.) which is made an expreſs diſqualification in Weſtminſter, by ſtat. 29 Geo. II. c. 25. Perſons exempt from ſerving the office of conſtable are aged perſons, and in Weſtminſter thoſe 63 years old are expreſsly exempted by ſtat. 31 Geo. II. c. 17. § 13;—aldermen of London;—the preſident, commons and fellows of the college of phyſicians in London, by 32 Hen. VIII. c. 40; but no other phyſicians, nor they elſewhere:—apothecaries, practiſing in, or within ſeven miles of London, free of the company, or in the country having ſerved ſeven years, ſtat. 6 and 7 W. III. c. 4;—ſurgeons, free of the company of ſurgeons in London, examined, approved, and exerciſing the ſcience, by ſtats. 5 Hen. VIII. c. 6: 32 Hen. VIII. c. 42: 18 Geo. II. c. 15; and by cuſtom all ſurgeons (Com. Rep. 312.), and it ſeems by the ſame ſtats. barbers free of that company in London;—attornies of the courts of K. B. and C. P.;—practiſing barriſters;—diſſenters, being teachers and preachers in a congregation, tolerated by law, taking the oaths and making the required declaration, but not others, by 1 W. c. 18. § 11;—foreigners naturalized, who may rather be ſaid to be incapacitated;—militia-men, during the time of their ſervice, by 26 Geo. III. c. 107. § 130;—ſervants to members of parliament, but doubtful;—proſecutors of felons to conviction; the original proprietors, or firſt aſſignee of a certificate (commonly called a tyburn-ticket), if a pariſh or ward office; within the pariſh or ward where the felony happened; to be only once uſed, by 10 and 11 W. c. 23. § 23; but this is no exemption from ſerving the office for a manor, nor, as it ſhould ſeem, for a vill or townſhip; nor where the office is to be executed out of the privileged diſtrict;—but maſters of arts, juſtices of peace in another county, officers of the guards, officers or watchmen at the Cuſtom-houſe, tenants in ancient demeſne, and younger brothers of the trinity-houſe, cannot plead exemption. If, however, a gentleman of quality, or a phyſician, officer, &c. be choſen conſtable, where there are ſufficient perſons beſides, and no ſpecial cuſtom exiſts; ſuch perſons, it is ſaid, may be relieved in B. R. 2 Hawk. P. C. 100. c. 10. § 41. A conſtable, whoſe office is miniſterial, and not judicial, may appoint a deputy; but the conſtable is anſwerable, and his deputy ought to be ſworn, though this is not in all caſes neceſſary; but if the deputy is allowed and ſworn, the principal is not reſponſible. Diſſenters choſen to the office of conſtable, &c. ſcrupling to take the oaths, may execute the office by deputy, who ſhall comply with the law in this behalf, ſtat. 1 W. & M. c. 18. § 7. And by 31 Geo. III. c. 32. the like privileges are given to Roman Catholics on their taking and ſubſcribing the oath and declaration therein ſpecified. Conſtables may appoint a deputy to execute a warrant, when by reaſon of ſickneſs, &c. they cannot do it themſelves. A woman made conſtable, by virtue of a cuſtom, that the inhabitants of a town ſhall ſerve by turns, on account of their eſtates or houſes, may procure another to ſerve for her, and the cuſtom is good.

Conſtables are choſen by the common law at the leet, or, where there is no leet, at the tourn; ſometimes by the ſuitors, and ſometimes by the ſteward; and now, in many towns and pariſhes, by the pariſhioners: all according to ancient and particular uſage. But by whomſoever they ſhall be choſen and appointed, they are to be ſworn and placed in their office by the lord, or his ſteward, or by the ſheriff reſpectively, as being judge of the court. 2 Hawk. 62. If the conſtable be preſent when choſen, he is to take the oath in court; if abſent, he may be ſworn before a (ſingle) juſtice of the peace: but in the latter caſe, he ought to have ſpecial notice of his election, and a time and place ſhould be appointed for his taking the oath (well and truly to ſerve the office). Every petty conſtable being a principal peace officer, and it being neceſſary for the preſervation of the peace, that every vill ſhould be furniſhed with one, the juſtices of the peace have, ever ſince the inſtitution of their office, taken upon them, as conſervators of the peace, not only to ſwear the petty conſtables, who have been choſen at a tourn or leet, but alſo to nominate and ſwear thoſe who have not been choſen at any ſuch court, on the neglect of the ſheriffs or lords to hold their courts, or to take care that ſuch officers are appointed in them. And this power of juſtices of the peace, having been confirmed by the uninterrupted uſage of many ages, ſhall not now be diſputed, but ſhall be preſumed to have been grounded on ſufficient authority. Some have carried this point ſo far, as to allow the juſtices, at their ſeſſions, to ſwear one who was choſen at the leet, and unduly rejected by the ſteward, who had ſworn another in his place. 2 Hawk. 65. A conſtable has been ſworn by a ſingle juſtice of the peace; and upon motion for an information as not being duly ſworn, the court held this to be a good ſwearing. 2 Strad. 1149. It is certain that juſtices of the peace had power to nominate and ſwear conſtables, on the default of the tourn or leet, before the ſtatute of 13 & 14 C. II. c. 12.; and therefore that they have ſuch authority in ſome caſes not mentioned in that ſtatute, which enacts, that if a conſtable ſhall die, or go out of the pariſh, any two juſtices may make and ſwear a new one, until the lord ſhall hold a leet, or till the next quarter ſeſſions, who ſhall approve of the officer ſo made and ſworn, or appoint another; and if any officer ſhall continue above a year in his office, the juſtices in their quarter ſeſſions may diſcharge him, and put in another, till the lord ſhall hold a court as aforeſaid. 2 Hawk. 65. 13 & 14 C. II. c. 12. § 15. It ſeems to be clear at this day, that the King's Bench hath power by mandamus to compel the court or judge to ſwear a conſtable duly choſen. 2 Hawk. 65. And conſtables lawfully choſen, if they ſhall refuſe to be ſworn, may be bound over by a juſtice of the peace to the aſſizes or ſeſſions, there to be indicted. Dalt. c. 28. 2 Str. 920. But it ſeems that a juſtice hath no power to commit any perſon for ſuch refuſal and no more, the proper mode being to indict him upon his refuſal; and if found againſt him, to aſſeſs a good fine upon him. Cro. Car. 567.

Conſtables of London, which city is divided into 26 wards, and every ward into precincts, in each of which is a conſtable, are nominated by the inhabitants of each precinct on St. Thomas's day, and confirmed, or otherwiſe, at the court of wardmote; and after they are confirmed, they are ſworn into their office, at a court of aldermen, on the next Monday after Twelfth-day. The oath of theſe conſtables is long and particular, and comprehends a variety of duties, now ſeldom performed, but regulated by articles of the Wardmote inqueſt, which directs the conduct of the conſtable; who is a kind of ſuperintendant of the morals of the inhabitants, and who ought to notice all new-comers, that thoſe whoſe character is bad may be required to give ſecurity for their good behaviour, or be impriſoned. Carth. 129. 138. Every conſtable may execute warrants through the whole city. Such as are choſen into the office are obliged to place the king's arms, and the arms of the city, over their doors; and if they reſide in alleys, at the ends of ſuch alleys, towards the ſtreets, to ſignify that a conſtable lives there, and that they may be more eaſily found when wanted.

The general duty of all conſtables, both high and petty, is to keep the king's peace in their ſeveral diſtricts; and for this purpoſe they are armed with very large powers, of arreſting, and impriſoning, and of breaking open houſes, and the like. One of their principal duties, ariſing from the ſtatute of Wincheſter, which appoints them, is to keep watch and ward in their reſpective juriſdictions. See WARD and WATCH.

If any one ſhall make an affray or aſſault upon another, in the preſence of the conſtable, or ſhall threaten to kill, beat, or hurt another, or in a fury be ready to break the peace; the conſtable may commit him to the ſtocks, or other ſafe cuſtody, and afterwards take him before a juſtice, or to a gaol, until he ſhall find ſurety for the peace; and if the party will not find ſurety to the conſtable, he may impriſon the party till he ſhall do it, provided the offence be in his own view. Dalt. c. 1. Cro. Eliz. 375, 376. The duties of conſtables are ſo numerous and minute, in conſequence of a variety of ſtatutes, that the mere recital of them would extend this article beyond its due bounds. They will be found under ſeveral different heads or titles, that occur in this work.

If a conſtable neglect any duty incumbent on him either by common law or by ſtatute, he may be indicted and fined by the juſtices of peace, to whom he is ſubordinate. If he will not return his warrant, or certify what he has done under it, he may be fined. If he wilfully lets a felon eſcape out of the ſtocks, and go at large, it is felony; and it ſeems generally agreed, that all voluntary eſcapes in the officer amount to the ſame crime as the offender was guilty of, whether treaſon or felony. 2 Hawk. P. C. c. 19. § 22, &c. It is a miſdemeanour in him to diſcharge an offender, brought to the watch-houſe by a watchman in the night. In ſhort, he is liable to various pecuniary, and ſometimes perſonal, puniſhments, on neglecting the duty impoſed on him by various ſtatutes. As by his office he is ſubordinate to a juſtice of the peace, he is bound to execute his warrants; and therefore it hath been reſolved, that where a ſtatute authoriſes a juſtice of the peace to convict a man of a crime, and to levy the penalty by warrant of diſtreſs, without ſaying to whom ſuch warrant ſhall be directed, or by whom it ſhall be executed, the conſtable is the proper officer to ſerve ſuch warrant, and indictable for diſobeying it. 2 Hawk. 262. By 33 Geo. III. c. 55. two juſtices, at any ſpecial or petty ſeſſions, upon complaint upon oath, of any neglect of duty, or diſobedience of any lawful warrant or order of any juſtice, by any conſtable, or other peace or pariſh officer, (ſuch perſon being duly ſummoned to appear and anſwer to ſuch charge,) may impoſe, upon conviction, any reaſonable fine, not exceeding 40*s*., upon ſuch conſtable, &c.; and if not paid, levy the ſame by diſtreſs and ſale of the goods of ſuch offender, to be applied to the poor of the pariſh or place where he reſides; or for want of ſuch diſtreſs, the offender ſhall be committed to the houſe of correction for any time not exceeding ten days. The officer executing ſuch warrant, if required, ſhall ſhew the ſame to the perſon, whoſe goods and chattels are diſtrained, and ſuffer a copy of it to be taken. 27 Geo. III. c. 26.

On the other hand, the conſtable is protected by law, in the execution of his duty. By ſtat. 7 Jac. I. c. 5. 21 Jac. II. c. 12. if any action is brought againſt a conſtable for any thing done by virtue of his office, he, and all who aid him, may plead the *general iſſue,* give the ſpecial matter in evidence, and if he recovers, ſhall have double coſts; but this muſt be certified on the record by the judge: and ſtat. 19 Geo. II. c. 21. againſt profane ſwearing, gives treble coſts. By ſtat. 24 Geo. II. c. 44. no action ſhall be brought againſt any conſtable or others aſſiſting him for any thing done in obedience to any warrant of a juſtice of peace, until demand of the peruſal and copy of ſuch warrant, and the ſame hath been refuſed or neglected for the ſpace of ſix days, &c. &c. No action ſhall be brought againſt any conſtable but within ſix months after the act committed. For the charges of conveying malefactors to gaol, ſee COMMITMENT. By 27 Geo. II. c. 20. the conſtable executing a juſtice's warrant, for levying a penalty or other ſum of money directed by an act of parliament by diſtreſs, may deduct his own reaſonable charges; and if any perſon ſhall be appointed to execute any warrant for felony, two juſtices may order by warrant under their hands a reaſonable allowance to ſuch ſpecial conſtable for his expences and loſs of time, to be paid by the treaſurer out of the county rate. 41 Geo. III. c. 78. Two juſtices may in like manner order an allowance to be made to any high conſtable for exttaordinary expences incurred in the execution of his office, to be defrayed in the ſame manner. And by 18 Geo. III. c. 19. every conſtable, headborough, and tything-man, ſhall every three months, and within fourteen days after he goes out of office, deliver to the overſeers of the poor a written account, entered into a book kept for that purpoſe, and ſigned by him, of all ſums expended in conſequence of his office, which the overſeers within the next fourteen days ſhall lay before the inhabitants, and if approved, the money ſhall be paid out of the poor rate: but if diſallowed, they are to return the book to the conſtable, who may produce it before a juſtice of peace, giving reaſonable notice to the overſeers; and the juſtice ſhall examine the account, ſettle the ſum due, ſign the account, and order payment out of the poor rate; the overſeers, however, may appeal to the quarter ſeſſions.

If a onſtable commits a perſon in charge, he is not liable to an action for falſe impriſonment, though the charge be ill-founded; and if the conſtable is aſſaulted in the execution of his office, and the conſtable kill the aſſailant in a conteſt, it is no felony; but if the conſtable is killed, it ſhall be conſtrued premeditated murder. A juſtice of peace's warrant is a ſufficient juſtification of a conſtable in a matter within the juriſdiction of ſuch juſtice.

High conſtables ſhall account, if required, at the general or quarter ſeſſions, for the general county-rate by them received, on pain of being committed to gaol until they account; and they ſhall pay the money in their hands, according to the order of the court, under the like penalty. 12 Geo. II. c. 29.

Conſtables may be removed in the ſame manner and by the ſame authority by which they were choſen. The ſheriff, or ſteward of the leet, having power to place a conſtable in his office, has alſo a power of removing him. Juſtices of the peace have alſo diplaced ſuch conſtables as have been choſen and ſworn by them. Dalt. c. 28. 2 Hawk. 63, 65. And by 13 & 14 Geo. II. c. 12. if a conſtable ſhall continue above a year in his office, the ſeſſions may diſcharge him, and put another in his place, till the court ſhall hold a leet. And if the court, or other judge, ſhall refuſe to diſcharge a conſtable, the King's Bench may compel them by mandamus. 2 Hawk. 65. If a conſtable be diſcharged without juſt cauſe, the court of King's Bench will by rule of court order him to be reſtored to his place. Bulſt. 174.

Constables *of the Caſtles*, in *Antiquity*, were keepers or governors of the caſtles of the king, or of great barons, who were frequently hereditary, or by feudal tenure; ſuch were the conſtable of the Tower, the conſtable of London, or Baynard's caſtle, the conſtables of the caſtles of Dover, Windſor, Cheſter, Caernarvon, and other caſtles in Wales; ſome of which offices, though not now hereditary, are remaining to this day. Their office ſeems to have been the ſame with that of the *caſtellani*, or governors of caſtles. Theſe conſtables are thoſe to whom Magna Charta (c. 17. 20.) refers; and who in the ſtat. of Weſtm. 1. (3 Ed. I.) c. 15. are called conſtables of fees, and there conſidered as keepers of priſons; a conſtituent part indeed of all ancient caſtles. 2 Inſt. 31. The ſtatute of 5 Hen. IV. c. 10. reciting the oppreſſions of theſe conſtables, and enacting that none be impriſoned but in the common gaol, ſeems to have put an end to a race of tyrants, who, by their miſconduct, had rendered themſelves odious to the people.

Constable *of France*. See Connetable.

Constable, *Provoſt of the*. See Provost.

Constable, in *Biography*, general of the Dominican order about the end of the ſixteenth century, was born at Ferrara, to which city he was conſtituted inquiſitor, and afterwards nominated maſter of the holy palace by pope Gregory XIII. In literary hiſtory he is known by a work entitled, "De cauſis in ſancto officio cognoſcendis," which related to the hiſtory of the dreadful tribunal invented by the founder of his order. His own zeal in the duties of the office to which he had been choſen was exemplary; and to exceſſive fatigue and over exertions occaſioned in viſiting on foot the monaſteries under his government, is to be aſcribed an illneſs that terminated in his death, at Venice on 17th of Sept. 1582. Moreri.

CONSTADT, or Kunstadt, in *Geography*, a ſmall town of Pruſſia, ſituated in Lower Sileſia, in the principality of Oels.

CONSTANCE, Costantz, or Costnitz, a conſiderable town of Wirtemberg, in the circle of Swabia, formerly a free imperial city, under the protection of Auſtria, delightfully ſituated at the north-weſtern extremity of the lake of Conſtance, where the Rhine iſſues out of it again; or between the two lakes; 45 miles N.E. from Zurich. N. lat. 47° 40′. E. long. 9° 12′. The fort of Peterhauſen defends it on the left ſide of the Rhine. "I was much afflicted," ſays Mr. Coxe, who viſited this place in 1776 (ſee Travels in Switzerland, vol. i. p. 16.) "with the ſolitary appearance of a town once ſo flouriſhing in commerce, and ſo celebrated in the annals of hiſtory. A dead ſtillneſs reigns throughout; graſs grows in the principal ſtreets; in a word, it wears the melancholy aſpect of being almoſt totally deſerted, and ſcarcely contains 3000 inhabitants. This city has endured a ſad reverſe of fortune; it was formerly in alliance with Zuric and Baſle; and, ſupported by their aſſiſtance, expelled the biſhop, and embraced the reformation. But the Proteſtant cantons being worſted in 1351; and the league of Smalcalde, of which Conſtance was a member, being defeated by Charles V., the town was obliged to ſubmit to the emperor," (having been placed under the ban of the empire in the year 1548, for deſerting the Roman Catholic religion), "and readmit the Catholic religion. From this period it loſt its independence." In 1549 it was placed under the power of the houſe of Auſtria by Ferdinand I.; and though the eſtates of Swabia refuſed their aſſent, the ſubjection was ratified by the diet at Augſburg. Being neglected by the houſe of Auſtria, the town fell to decay. Conſtance ſomewhat revived, and afforded the proſpect of becoming a commercial town, through the permiſſion granted by the emperor Joſeph, to the emigrants from Geneva, of ſettling and carrying on their trade and manufactures, with very conſiderable privileges; the principal of which were the following: *viz.* the right of purchaſing or building houſes; the free exerciſe of religion, entirely independent of the Catholic clergy; the power of erecting a tribunal for the purpoſe of deciding all affairs relative to their manufactures and commerce; exemption from ſerving in the militia and quartering ſoldiers, from all contributions during the ſpace of 20 years, from duties on their tools and utenſils; and the invariable eſtabliſhment of the ſtandard of the gold and ſilver employed in their manufactures. "Theſe favourable terms (ſays Mr. Coxe) ſigned on the 30th of June 1785, attracted ſo many ſettlers to Conſtance, that in my ſecond viſit to this place, on the 25th of October 1787, the new colony of Genevans conſiſted of 70 families, compriſing 350 perſons: among theſe were 54 watch-makers, who had introduced the different branches of manufacture which belong to their trade. Four hundred watches were already finiſhed, and above 1400 more were preparing. The emperor alſo has granted to Mr. Macaire the convent of Dominicans lately ſecularized, towards eſtabliſhing a manufacture of printed linens and cottons. The refectory is appropriated for the chapel of the new colony." "This convent, which was once the aſylum of monkiſh ſuperſtition, is now the ſeat of trade and induſtry; and it muſt ſuggeſt a pleaſing reflection to a philoſophic mind, that a ſucceſſor of Sigiſmond, who violated his word," (as in the caſe of Huſs) "ſhould have conſigned to a reformed eſtabliſhment that very convent in which the Bohemian divine was impriſoned, and from which he was led to the ſtake; and that the moſt enlarged principles of toleration ſhould be manifeſted in the ſame ſpot where perſecution was inculcated by precept and examples. It is the triumph of reaſon and religion over bigotry and intolerance." Since the period to which we have now referred, France has extended its revolutionary ſpirit and operations to the ſtates of Switzerland; and time muſt develope their effects on the liberty and commerce, and conſequent proſperity of the country. See Helvetic Confederacy and Switzerland. At preſent the manufactures and commerce of Conſtance are inconſiderable. Its celebrity is chiefly owing to a council held here from 1414 to 1418, which depoſed three popes, *viz.* John XXIII., Gregory XII., and Benedict XIII., who had ſet up againſt each other; appointed Martin V. in their room, condemned the doctrine of Wickliff, and committed his works to the flames, in 1415; and cauſed John Huſs and Jerome of Prague to be burnt, the former July 6, 1415, and the latter May 30, in 1416. At this council the aſſembled fathers on the 14th of June in 1415, paſſed the famous decree which took the cup from the laity in the celebration of the euchariſt, ordered that the Lord's ſupper ſhould be received by them only in one kind, *i. e.* the bread, and rigorouſly prohibited the communion in both kinds. The hiſtory of this council by L'Enfant is compoſed with great accuracy and elegance. A ſecond edition of this work appeared at Amſterdam in the year 1728, in 2 vols. 4to.: the firſt was publiſhed in 1714. For an account of the treaty at Conſtance, A. D. 1183; ſee the article City.

CONSTANCE, *Lake of*, ſeparates Switzerland from that part of Germany hitherto called the circle of Swabia.

It is divided into three parts: the upper part, which is the broadeſt, is called *Boden-See*, the middle part *Bodmer-See*, and the lower part *Zeller-See*.

The ſuperior lake is about 15 leagues in length, and 6 in its greateſt breadth. The borders conſiſt of gently riſing hills; on the left hand Swabia, and on the right Thurgau, with a variety of ſcattered towns, villages, and monaſteries, and delightful villas, which afford ſeveral views to thoſe who navigate the lake, that are truly enchanting. The form of the lake inclines to an oval, and the water is of a greeniſh hue. This lake, like all the other lakes of Switzerland, is conſiderably deeper in ſummer than in winter; a circumſtance which is owing to the firſt melting of the ſnow from the neighbouring mountains. It abounds with all ſorts of fiſh, and more particularly with the ſpecies of trout, called in its vicinity "Illankin," and by Linnæus SALMO *lacuſtris*. A little above Stein, which is an independent town, under the protection of Zurio; the Rhine widens conſiderably, and forms the inferior lake of Conſtance, or the *Zeller-ſee*, which is divided into two branches; from Stein to Conſtance is about 16 miles, and from the latter to Zell, its greateſt breadth, about 10.

Near Merſbourg the lake of Conſtance is ſaid to be 350 fathoms deep. This great depth is extremely advantageous to commerce, the lake being navigated by veſſels of 100 tons and upwards. There are two iſlands in its middle, on one of which is the town of Lindau, formerly a free imperial city, but belonging now to the king of Bavaria, who, by the treaty of the confederation of the Rhine, has engaged to have it fortified and provided with artillery eſtabliſhments. On the other iſland, about a mile in circumference, is the town of Meinau, which belonged to the knights of the Teutonic order, and whoſe ſituation is delightful.

The Rhine enters the lake of Conſtance at its ſouth-eaſtern extremity, and iſſues out of it again at the north-weſt, not far from Stein. There is an ancient, and generally accredited tradition, that the Rhine, in croſſing the lake in all its length, does not mix with its water. The ſame is ſaid of the Rhone, which runs through the lake of Geneva. Pliny the Elder, and Ammianus Marcellinus, are the authors of theſe fables. It is true that the two rivers are diſtinctly ſeen ſome time after their entrance into the lakes, but the difference of colour vaniſhes as ſoon as they have depoſited the ſand which they carry. Mr. Coxe, ſeated on board a veſſel on the lake, in vain attempted to diſtinguiſh the waters of the Rhine from thoſe of the lake. The river, in its courſe from the ſuperior lake, being exactly of the ſame beautiful greeniſh colour as the inferior lake into which it flows; it is evident that the one can never be diſtinguiſhed from the other. Probably, upon its firſt entrance into the ſuperior lake it is troubled, and, conſequently, for ſome diſtance, its current may be eaſily traced; but it purifies itſelf by degrees, and becomes an indiſtinct part of the great body of water.

Of no better foundation is the report that the lake of Conſtance never freezes. Wagner aſſures that it was frozen in 1572 and 1596, when two inhabitants of Conſtance walked over the lake on the ice, meaſured it, and found it to be 7265 fathoms long, from Romizhorn to Bouchorn, which is not its whole length.

CONSTANCY, in a general ſenſe, denotes immutability; but in ethics, or the philoſophy of the human mind, the term implies reſolution or ſteadineſs, particularly under adverſe trials and ſuffering. It was the ſaying of a heathen philoſopher, that there cannot be imagined upon earth a ſpectacle more worthy of the regard of the creator, intent on his works, than a brave man ſuperior to his ſufferings. Nothing, indeed, can be more noble or honourable, than to poſſeſs courage ſufficient for executing the injunctions of reaſon and conſcience; for maintaining the dignity of our nature, and the ſtation aſſigned us; and for being ſo much unafflicted by poverty, pain, and even death itſelf, as not to do any thing that is reproachful or ſinful in order to avoid them. To poſſeſs this temper, is to be great above title and fortune; and manifeſts a mind of heavenly extraction, and worthy of the offspring of the deity. Of this kind, many illuſtrious inſtances occur in hiſtory, and particularly in the hiſtory of the Chriſtian church, and of the laſt moments of confeſſors and martyrs.

CONSTANS I., FLAVIUS JULIUS, in *Biography*, third ſon of Conſtantine the Great, by Fauſta, was born A. D. 320, and was created Cæſar at ſix years of age. Upon the death of his father in 337, Conſtans ſucceeded to the ſovereignty of Italy, Africa, and the weſtern Illyricum, as his ſhare of the empire. He had enjoyed his power but three years, when he was attacked by his brother Conſtantine, whom he defeated and ſlew.

Conſtans, by this victory, became poſſeſſor of Gaul, Spain, and Britain; and in his turn, attacked the Franks, whom he humbled, and the Scots, which probably did not end much to his credit, as no notice is taken of the fact by his early biographers. Neverthleſs, the prince was elated by the ſucceſs of his arms, and aſſumed a degree of pride on the occaſion, which would have ill become any man, and in him was rendered quite contemptible, owing to his want of talents and application. He was, moreover, a ſlave to his paſſions, and allowed himſelf in acts of voluptuouſneſs, that drew down upon him the indignation of the people. Magnentius, an ambitious ſoldier, encouraged by popular diſcontents, was reſolved to aſſert the honour of the Roman name. A conſpiracy was formed, and Marcellinus, count of the ſacred largeſſes, who had already ſupplied, with a liberal hand, the means of ſeduction, under pretence of celebrating his ſon's birth-day, gave a ſplendid entertainment: the intemperance of the feaſt was artfully protracted till a late hour, and the unſuſpecting gueſts were tempted to indulge themſelves in a dangerous freedom of converſation. On a ſudden, the doors were thrown open, and Magnentius, who had retired for a few moments, returned into the apartment inveſted with the diadem and purple. The conſpirators inſtantly hailed him with the titles of Auguſtus and emperor. The guards immediately took the oath of fidelity, and ere the dawning of the day, Magnentius became maſter of the troops and treaſure of the palace and city of Autun. Conſtans, who was purſuing his pleaſure in an adjacent foreſt, being informed of the fact, threw off the imperial robes, and fled towards Spain; but before he could reach the ſea-port, where he intended to embark, he was overtaken by a party of cavalry near Helena, at the foot of the Pyrenées, and put to death. Gibbon. Univer. Hiſt.

CONSTANS II. grandſon of Heraclius, emperor of the Eaſt, was raiſed to the throne in 641, after the ſenate had depoſed the uſurper Heracleonas, and his mother Martina. He was then only in his twelfth year, yet before the Byzantine ſenate, he delivered an oration that did him great credit. Having returned thanks for the juſt puniſhment of the aſſaſſins, who had intercepted the faireſt hopes of his father's reign, he added "By the divine providence, and by your righteous decree, Martina and her inceſtuous progeny have been caſt headlong from the throne. Your majeſty and wiſdom have prevented the Roman ſtate from degenerating into lawleſs tyranny. I therefore exhort and beſeech you to ſtand forth as the counſellors and judges of the common ſafety." The ſenators were gratified by the reſpectful addreſs of their ſovereign; but Conſtans was anxious to ſecure the crown that had ſuddenly devolved on him. He obliged his elder brother Theodoſius to take holy orders, which rendered him incapable of civil government. The young emperor was not ſatisfied with this act, which was regarded as a profanation of the ſacraments, but he cauſed Theodoſius to be put to death. The act was ſcarcely perpetrated before the execrations of his ſubjects, joined to the agonies of remorſe, rendered life a burden. He could no longer bear to reſide in the capital that had been the witneſs of a baſe and infamous fratricide. He became a voluntary and perpetual exile; and embarking for Greece, diſplayed the hatred which he felt, and was conſcious that he inſpired, by ſpitting againſt the walls of Conſtantinople as he left them. After paſſing the winter at Athens, he viſited various parts of Italy, and concluded a pilgrimage of diſgrace, by fixing his reſidence at Syracuſe. Conſtans eaſily fled from the imprecations of an injured people, but he could not forget what he had done. The remorſe of his conſcience created a phantom that purſued him wherever he went: the image of his murdered brother was ever before his eyes, preſenting to his lips a cup of blood, and ſaying, or ſeeming to ſay, "Drink, brother, drink,"—"a ſure emblem," ſays the hiſtorian, "of the aggravation of his guilt, ſince he had received from the hands of the deacon, the myſtic cup of the blood of Chriſt." Conſtans, however, did not reſign the cares of government. He took part in ſome wars carried on in Italy, and having been ſucceſsful, entered the capital with great pomp, and was met by the pope and clergy at a diſtance from the city. In return for this mark of reſpect, he plundered Rome, and ſent its wealth and ornaments to Conſtantinople. He then departed for Syracuſe, where he reſided five years, oppreſſing the people, and hated by thoſe about him. Domeſtic treaſon put an end to his life; he was aſſaſſinated while he was in the bath, in in the year 668, after a miſerable reign of 27 years. Gibbon. Univer. Hiſt.

CONSTANT, David, was born at Lauſanne, in Switzerland, in the year 1638, and became diſtinguiſhed as a proteſtant divine, and profeſſor of theology. He was indebted to his own country for the rudiments of uſeful knowledge, and was afterwards a ſtudent at Herborn in Germany, from which place he went to Groningen, Leyden, and Paris, for farther improvement. At Paris, he became acquainted with many very celebrated members of the reformed church, and having laid the foundation of ſolid learning, and formed a connection with ſeveral worthy characters, he returned to Switzerland in the year 1658, was ordained miniſter according to the calviniſtic form, and undertook the charge of a church at Copet. Here he cultivated a literary intimacy with Turretin, Tronchin, and other profeſſors in the univerſity of Geneva, and with Bayle, the celebrated hiſtorian, but who at that time was tutor in the family of count de Donha, baron of Copet, the patron of David Conſtant. On a vacancy at the college of Lauſanne, Conſtant was appointed tutor to the firſt claſs, by the magiſtrates of Berne, and was afterwards elected profeſſor of moral philoſophy and the Greek language. The important duties of theſe ſtations he diſcharged with high honour to himſelf, and to the advantage of thoſe placed under his inſtructions; his vacant hours were employed in editing ſome of the claſſics, or on original works. By his contemporaries he was much reſpected; they regarded him as a man of conſiderable literary acquirements, poſſeſſed of a ſolid judgment and a correct taſte. In the year 1700, he was choſen profeſſor of theology, a ſituation which he retained until he was eighty-nine years of age, when he reſigned in favour of a ſucceſſor, reſerving to himſelf, even then, the right of giving his aſſiſtance and advice at the public meetings of the college. He died in 1733, having attained the venerable age of ninety-five. He publiſhed new editions of Florus; of Cicero's ſmaller pieces, and of various other pieces adapted to the uſe of ſchools. His original writings were reſpectable; they were diſſertations on curious theological ſubjects. We have alſo "Syſtema Ethico-theologicum," printed at Lauſanne, 1695; a work "De Juramentis;" and another "On Providence."—Moreri.

Constant *quantity*, in *Geometry*, that which remains the ſame, while others increaſe or decreaſe. Thus the ſemidiameter of a circle is a *conſtant quantity;* for while the abſciſs and ſemi-ordinates increaſe, it remains the ſame.

Constant *winds*. See Wind.

CONSTANTIA, in *Ancient Geography*, a town of Valeria, in the vicinity of the Danube.—Alſo, a town of Thrace, in the territory of mount Rhodope.—Alſo, a town of Aſia, in Meſopotamia; ſaid by Ammianus Marcellinus to have been *Amida*, which was enlarged by the emperor Conſtantine, and aſſumed his name.—Alſo, a name given to Majumas, the port of Gaza, after Conſtantine raiſed it to the rank of a town and gave it the name of his ſon.—Alſo, a name given to the town of Salamine.—Alſo, a name aſſigned by Conſtantine to the town of Arelata (Arles), according to Auſonius, cited by Scaliger.

Constantia *Caſtra*, a town of Gaul, in the ſecond Lyonnenſis; now *Coutances*.

Constantia, in *Geography*, a diſtrict of the Cape of Good Hope, a mile and a half from Alphen, cloſe under the mountains, about midway between Table bay and Falſe bay, conſiſting of two farms which produce the far-famed Cape or Conſtantia wine, ſo remarkable for its peculiar rich flavour and ſweetneſs. One of the farms where the white wine is made is called *Little Conſtantia;* the other produces red. There are only from fifty to one hundred caſks, of 154 gallons each, made annually of the genuine Conſtantia wine. The grape is the muſcadel, and the rich quality of the wine is owing partly to the ſituation and ſoil of the vineyards, and partly to the care taken in manufacturing the wine. No ſtalks, and no fruit but ſuch as is full ripe, are ſuffered to go under the preſs; precautions rarely taken by the other farmers of the Cape, who make annually about ſix hundred 154-gallon caſks of the common Cape wine, which, however, is frequently brought into the European markets, under the name of Conſtantia wine. The muſcadel grape grows at every farm: and at ſome farms in Drakenſtein, the wine preſſed from it is equally good, if not ſuperior, to the Conſtantia, though ſold, on account of the name of the latter, at one ſixth part of the price. This wine ſells at the Cape for 70 or 80 rix-dollars for the half-aum, which ought to contain 20 gallons; but the avaricious diſpoſition of the proprietors, has led them to fabricate falſe caſks, few of which that come to England being found to meaſure more than 17 or 18 gallons, and many not above 16. When they find that the wine is to be ſent abroad, they adulterate it with ſome other wine. For, according to their own returns, the quantity exported and conſumed in Cape Town, as in the caſe of Madeira wine, greatly exceeds the quantity manufactured.

The following table ſhews the quantity of Conſtantia wine exported in four ſucceſſive years.

Years.	Half Aums.	Value.
1799	157	11,752
1800	188	14,070
1801	173	13,007
1802	210	15,745
In 4 years.	728	54,574 R. D.

Barrow's Travels in S. Africa, vol. ii. p. 290.

CONSTANTINA, or CONSTANTINE, the eaſtern province of the kingdom of Algiers, which ſee. This province, which is the largeſt and richeſt of the four provinces into which Algiers is commonly divided, (the three others being Maſcara, the territory of the city of Algiers, and Titeri,) lies betwixt the meridians of the rivers Booberak and Zaine, which ſeparates it from Tunis, and is bounded on the north by the Mediterranean, on the eaſt by the kingdom of Tunis, on the ſouth by Biledulgerid, and on the weſt, in its greateſt extent, by the river Malva, or by the territory of Algiers, &c. It is nearly equal in extent to the two weſtern and ſouthern provinces, being, by Dr. Shaw's ſtatement, 230 miles in length, and more than 100 in breadth; and far ſurpaſſing them in wealth and ſtrength, as well as in the number and goodneſs of its cities. The tribute collected by the viceroy of this province, according to Dr. Shaw, is proportionably greater. For whilſt the Titeri bey brings every year into the treaſury of Algiers little more than 12,000 dollars, each dollar being 3*s.* and 4*d.* or 6*d.*, and the Tlemſan bey from 40 to 50 thouſand; the viceroy of Conſtantina never pays in leſs than 80, and ſometimes 100 thouſand. The ſea-coaſt of this province, from the Booberak to Boujeiah, and from thence almoſt entirely to Bona, is rocky and mountainous; and the whole tract which lies between the meridians of the rivers Booberak and Zhorre, from the ſea-coaſt to the parallels of Seteef and Conſtantina, is, for the moſt part, a continued chain of exceedingly high mountains; few of whoſe inhabitants, from the ruggedneſs of their ſituation, pay any tribute to the Algerines. Near the parallels of Seteef and Conſtantina it is diverſified with a beautiful interchange of hills and plains, which afterwards become leſs fit for tillage, till it terminates, upon the Sahara, in a long range of mountains, ſuppoſed by Dr. Shaw to be the *Buzara* of the ancients. The diſtrict of *Zaab* (which ſee) lies immediately under theſe mountains; and beyond Zaab, at a great diſtance in the Sahara, is Wadreag, another collection of villages. This part of the eaſtern province, including the parallel of Zaab, anſwers to the *Mauritania Sitifenſis*, or the firſt Mauritania, as it was called in the middle age. The mountains are inhabited by free Arabian and Mooriſh tribes, which from time to time have proved formidable enemies to the power of Algiers. The moſt remarkable places are *Boujeiah* or BUGIA, CULLU, BONA, LA CALLE, the iſland of TABARCA, and CONSTANTINA; which ſee reſpectively.

CONSTANTINA, *Conſtantine*, formerly *Cirta*, is one of the moſt conſiderable cities of ancient Numidia, the capital of the above-deſcribed province, and the reſidence of the bey. Next to Algiers, it is the moſt populous city in the Algerine dominions. For a particular account of it, ſee CIRTA.

CONSTANTINA, a town of Spain, in Andaluſia; 50 miles S.W. of Cordova, and 42 N.N.E. of Seville.

CONSTANTINA, in *Ancient Geography*, a town of Phœnicia.—Alſo, a town of Aſia, in Meſopotamia.

CONSTANTINE I., FLAVIUS VALERIUS CONSTANTINUS, in *Biography*, the firſt Chriſtian emperor, and ſurnamed the GREAT, was ſon of Conſtantius Chlorus by Helena. The celebrity to which this prince attained, has rendered poſterity attentive to the moſt minute circumſtances of his life and actions. The place of his birth, and the condition of his mother, have been ſubjects of warm, not to ſay violent, diſputes. According to Mr. Gibbon, Helena was the daughter of an inn-keeper, and Naiſſus in Dacia was the birth place of her ſon, the ſubject of this article, about the year 274. In his youth he diſcovered little inclination to improve his mind by the acquiſition of knowledge; but the comelineſs of his figure, the dexterity which he exhibited in all manly exerciſes, and his known courage and affability, rendered him a favourite with the army and the people. He was about eighteen years of age when his father was promoted to the rank of Cæſar: this event was attended with his mother's divorce, in order to make way for the ſecond wife of Conſtantius, who could boaſt of an alliance with the imperial race. By this act the noble-minded Conſtantine was reduced to a ſtate of diſgrace and humiliation. Indignant, probably, at the baſe conduct of his father, he remained in the ſervice of Diocleſian, and ſignalizing himſelf in the wars of Egypt and Perſia, he was raiſed to the rank of tribune of the firſt order. The popularity of this young man rendered him an object of jealouſy to Galerius, through whoſe intereſt he had already been denied the rank of Cæſar. Endangered by the power and wiles of his opponent, and being ſent for by Conſtantius, his father, whoſe health was daily declining, he ſecretly left Nicomedia, where he then was, and travelled with all expedition to Boulogne, and embarked with Conſtantius for Britain. The expedition was proſperous, and they eaſily obtained a victory over the Caledonians; but it was the laſt exploit of Conſtantius. He died at York, in the year 306, within little more than a year after he had received the title of Auguſtus. His death was immediately ſucceeded by the elevation of Conſtantine, who was proclaimed emperor by the army. The throne was the object of his ambition; and he knew too well the character of Galerius, the colleague of his late father, to heſitate as to the part he muſt take in this criſis. He was ſatisfied that if he wiſhed to live, he muſt reſolve to reign. At firſt he affected to reſiſt the choice of his people, and wrote a reſpectful letter to the emperor of the Eaſt, acquainting him with the event. The earlieſt emotions of Galerius were thoſe of ſurpriſe, diſappointment, and rage: he threatened to commit to the flames the letter, and him that brought it. Upon farther deliberation, he reſolved not to conteſt his ſucceſſion to the ſovereignty of the provinces beyond the Alps; but conferred on him the title of Cæſar, reſerving that of Auguſtus to his favourite Severus. Conſtantine, who already poſſeſſed the ſubſtance, expected without impatience an opportunity of obtaining the honours, of ſupreme power; and accordingly employed himſelf ſome years in governing and ſecuring the dominions fallen to his ſhare. In defending his own rights, he was often betrayed into acts of cruelty, unworthy of a great mind. Contending with the Franks, he took two of their kings, whom he barbarouſly expoſed to wild beaſts in the amphitheatre of Treves: in ſome inſtances where he was victorious, he ſpared neither ſex nor age; exhibiting a ferocity that ſeems ill to accord with the general tenor of his character, to which he was probably prompted by the ſuppoſition, that upon a barbarous foe all kinds of barbarity were allowable. In 307 he married Fauſta, daughter of Maximian, who had reſumed the purple; but he took no part in the fortunes of his father-in-law, who was ever engaged in warfare, till he became himſelf Conſtantine's open enemy, and endeavoured to diſpoſſeſs him of his rightful authority. Under theſe circumſtances he was delivered into the hands of his ſon-in-law, who ſhewed him no other favour than that of allowing him the choice of the manner in which he would die: Maximian ſtrangled himſelf in the year 310.

Shortly after this event, which was little creditable to the feelings of Conſtantine, or to the filial piety of Fauſta, who took no means to ſoften the reſentment of her huſband, a civil war broke out. Maxentius, who had reigned in conjunction with Conſtantine, now laid claim to the monarchy of the whole Weſt, and made preparations for an invaſion of Gaul. Conſtantine relying as well on his own talents, as on the hatred borne to his rival, reſolved to anticipate the attack, and to carry the war into the heart of Italy. The armies of Maxentius, amounted to one hundred and ſeventy thouſand foot, and eighteen thouſand horſe. The wealth of Italy ſupplied the expences of the war, and the adjacent provinces were exhauſted to form magazines of corn and other kinds of proviſions. The whole force of Conſtantine conſiſted of ninety thouſand foot, and eight thouſand horſe; a large part of which was neceſſary to the defence of his other dominions. At the head of forty thouſand ſoldiers, he marched to encounter an enemy, whoſe numbers were at leaſt four times ſuperior to his own. Conſtantine had been trained from his earlieſt youth to war, to action, and to military command, and his troops were in the higheſt ſtate of diſcipline: theſe he diſpoſed with conſummate ſkill, and for himſelf he choſe the poſt of honour and danger. Diſtinguiſhed by the ſplendor of his arms, he charged, in perſon, the cavalry of his rival, and his irreſiſtible attack determined the fortune of the day. The victory was complete, and the diſmayed followers of Maxentius ruſhed by thouſands into the Tyber. The emperor himſelf attempted to eſcape back into the city over the Milvian bridge, but the crowds which preſſed together through that narrow paſſage, forced him into the river, where he was immediately drowned by the weight of his armour. His body which had ſunk deep into the mud, was found the next day; and the ſight of his head, when it was expoſed to the eyes of the people, convinced them of their deliverance, and led them to acknowledge as their ſovereign Conſtantine, who thus atchieved by his valour and high talents the moſt ſplendid enterprize of his life. It was previous to this battle, A. D. 312., that hiſtorians aſſign the date of Conſtantine's converſion to Chriſtianity, who had never before diſcovered religious principles of any kind. A ſplendid miracle is mentioned as the immediate inſtrument of this change. Dr. Lardner, indeed, offers ſome reaſons why Conſtantine could not well have remained through life without ſome religious impreſſions; he is however willing to follow the account of Euſebius, who ſays, that about the period of the war with Maxentius, the emperor was led to conſider that he ſtood in need of more powerful aſſiſtance than military forces; he therefore ſought for a God that ſhould be his helper. The hiſtorian goes on to ſay, that in part of his march, as the day was declining, there appeared to the ſight of Conſtantine, and to that of all his army, a luminous croſs above the ſun, with the inſcription *τȣτῳ νικα*, *by this conquer*; that the monarch not comprehending the meaning of this ſign was farther inſtructed, in the following night by a viſion of Chriſt himſelf, bearing his croſs, and directing him to take a ſimilar ſtandard, under which he ſhould march to victory. In the morning Conſtantine communicated this wonderful circumſtance to his friends; and ſending for ingenious workmen, he gave them a deſcription of the ſign, and ſaw them make one like it in gold and precious ſtones; which, ſays Euſebius, "we have ſeen." Much has been ſaid reſpecting this ſurprizing phenomenon. By ſome the whole is regarded as a fiction, a ſtratagem and political device of Conſtantine, yet it is related by Euſebius a grave hiſtorian, who declares that he had it from the emperor, who confirmed the narration by an oath. By Fabricius, we are told, that the appearance in the heavens was generally looked upon as a reality, and a miracle: but for his own part, he is inclined to conſider it as the reſult of a natural phenomenon in a ſolar halo; he accordingly admits of the reality of the phenomenon, but does not ſuppoſe it to be properly miraculous. Upon a full and candid review of the evidence, Dr. Lardner, whom we have before quoted, and than whom no one was a better judge of human teſtimony, ſeems inclined to doubt the relation given by the emperor, upon whoſe ſole credit the ſtory is recorded, though it was twenty years after the event, when Euſebius wrote his account, during which period he muſt have heard it frequently from eye-witneſſes, if the emperor's relation were accurate that the appearance was viſible to his whole army as well as to himſelf. The oath of Conſtantine, on the occaſion, with Dr. Lardner, brings the fact into ſuſpicion, and another ſtriking circumſtance is that Euſebius does not mention the place where this wonderful ſight appeared. Without, however, entering, at preſent, farther into the diſcuſſion, which we ſhall refer to the article Cross; we may obſerve, that Euſebius has led us to the period, when the ſign of the croſs began to be made uſe of by Conſtantine, among his armies, and at his battles; this was probably the day before the laſt battle with Maxentius, fought on the 27th of October, 312. About this period, it is admitted, that Conſtantine became a Chriſtian, and continued ſo the remainder of his life, taking care alſo to have his children educated in the ſame principles. His converſion ſeems to have been partly owing to his own reflections on the ſtate of things, partly to converſation and diſcourſe with Chriſtians, with whom, the ſon of Conſtantius, their friend and favourer, muſt have been ſome time acquainted, but perhaps, chiefly to the ſerious impreſſions of his early years, which being once made can never be wholly obliterated. Conſtantine was however a politician as well as a Chriſtian, and he probably hit upon this method to reconcile the minds of his army, to the important change in their religious profeſſion and habits, as well as making uſe of it as a mean of ſucceſs in his deſigns againſt his enemies, for which purpoſe he rightly judged, that the ſtandard of the croſs, and the mark of it as a device on his ſoldier's ſhields, would be of no ſmall ſervice.

We muſt now return to Conſtantine in the character of a victorious general. After the battle, he entered the capital in triumph, wholly deſtroyed the family of his rival, but refuſed to include among the victims, many whom the Romans would gladly have ſacrificed to their abhorrence of the late tyranny. He diſbanded and diſperſed the pretorian guards which had ſo often made and murdered emperors: he recalled many who had been baniſhed, and reſtored to them their eſtates: he diſcouraged informers, and promoted the welfare of the city. The ſenate immediately paſſed a decree, conferring on him the firſt rank among the three Auguſti, who then were maſters of the world: Licinius and Maximin were the other two. Africa readily followed Italy in recognizing the ſovereignty of the conqueror. To Licinius, with whom he had an interview, he gave his ſiſter Conſtantia in marriage, in order to ſtrengthen his own hands. From Milan, where the two emperors iſſued an edict under their joint authority, allowing a general toleration in religious matters within their dominions, Conſtantine was called by an attempt of the Franks to croſs the Rhine. Over theſe he gained a complete victory, and made many priſoners, whom, as in former inſtances, he expoſed to wild beaſts. In the mean time a civil war aroſe between Maximin and Licinius, which terminated in the deſtruction of the former, and the extirpation of his whole family.

Conſtantine and Licinius were now maſters of the world, but they did not long continue united. A war broke out between them in the year 314, but the reſult of ſeveral battles was decidedly in favour of Conſtantine. Licinius ſued for peace, which he obtained, and which continued eight years. In 323 another war was excited between the emperors. Licinius had long been hoſtile to the Chriſtians, whoſe affections he had alienated, and who looked up to Conſtantine as their patron, and the head of their religion. Aware of this circumſtance, and relying on his own ſuperiority, as a military commander, Conſtantine began the quarrel. Under the banner of the croſs, and accompanied by biſhops and other miniſters of their holy religion, he went out with 130,000 well-diſciplined and well-accoutred ſoldiers to meet his rival, who waited his arrival in the vicinity of Adrianople. Conſtantine was again victorious: Licinius fled to Byzantium, and when he found that place no longer tenable againſt the power of his enemy, he withdrew to Chalcedon, and from thence, after hazarding another battle, in which he was alſo unſucceſsful, to Nicomedia; where, by the interceſſion of his wife, he obtained a ſolemn promiſe of having his life ſpared, on the condition of his renouncing all claims to ſovereignty. To the diſgrace of Conſtantine impriſonment and death ſoon followed the humiliation of his rival. This deed has been juſtified on the plea that the fallen emperor had engaged in a treaſonable correſpondence againſt the reigning ſovereign, but ſufficient evidence of the fact was not adduced. The ſon of Licinius was alſo ſacrificed to the jealouſy of Conſtantine, who, by theſe atrocious means, delivered himſelf from all dread of oppoſition. An arbitrary prince ſeldom finds any difficulty in freeing himſelf from his enemies, but Conſtantine with all his powers, could neither foreſee, nor prevent, thoſe domeſtic calamities to which he ſhortly became the prey. Criſpus, his ſon, by a former wife, was viewed, by his mother-in-law Fauſta, as the chief obſtacle to the future greatneſs of her own children. She inſinuated into the breaſt of Conſtantine ſuſpicions of his ſon's loyalty, and is ſaid alſo to have brought a charge againſt him of having attempted her own chaſtity. Criſpus was examined, impriſoned, and put to death in the year 326. His grandmother Helena, convinced of his innocence, reſolved to be revenged for his hard fate, and found means of convicting the empreſs of an adulterous connection with a ſlave of the palace, for which ſhe was ſuffocated in the ſteam of a hot bath. From theſe circumſtances, and from the contempt which he ſhewed for the pagan rites, the emperor became unpopular with the people and the ſenate. On his part there was no perſonal attachment to the ancient metropolis, and he was reſolved to perpetuate his name by the foundation of a new city. After much deliberation he fixed on Byzantium, which he had once beſieged, as the imperial city that ſhould, with future ages, give him celebrity and renown. See CONSTANTINOPLE.

In the year 331 Conſtantine was involved in a war with the Goths, who at firſt were ſucceſsful againſt his power, but were, at length, defeated and compelled to agree to ſuch terms as the victor thought proper to propoſe. Conſtantine, by chaſtiſing the pride of the Goths, and by accepting the homage of a ſuppliant nation, vindicated the majeſty of the Roman empire; and ambaſſadors from Ethiopia, Perſia, and the moſt remote countries of India, came to congratulate him on the peace and proſperity of his government; and he ſeems to have enjoyed as uninterrupted a ſhare of felicity, as a man ſituated as he was could reaſonably expect. He attained to the thirtieth year of his reign, a period which none of his predeceſſors, ſince Auguſtus, had been permitted to celebrate. Conſtantine ſurvived that ſolemn feſtival about ten months, and, at the age of ſixty-four, after a ſhort illneſs, he ended his memorable life at a palace in the ſuburbs of Nicomedia, whither he had retired for the benefit of the air, and with the hope of recruiting his exhauſted ſtrength by the uſe of the warm bath. The demonſtrations of grief, or at leaſt of mourning, ſurpaſſed whatever had been practiſed on any former occaſion. The body of the deceaſed emperor was tranſported to the city which was deſtined to preſerve the name and memory of its founder: there it was adorned with the ſymbols of greatneſs, and depoſited on a golden bed in one of the apartments of the palace, which was ſplendidly illuminated and furniſhed for the purpoſe. Every day, at the appointed hours, the officers of ſtate, approaching the perſon of their ſovereign, offered the ſame reſpectful homage to his dead body as they had been accuſtomed to preſent to him during his life, ſo that it has been ſaid Conſtantine alone, by the peculiar indulgence of heaven, reigned after his death.

It remains now to give a general eſtimate of the character of this great man, who was unqueſtionably the moſt ſplendid among the Roman emperors. It is no wonder that a prince who removed the ſeat of empire, and introduced ſuch important changes into the civil and religious conſtitution of his country, ſhould have fixed the attention, and divided the opinions of mankind. By certain claſſes of Chriſtians he has been regarded as the deliverer and defender of the church, and has been decorated with every attribute of a hero, and even of a ſaint: by others he has been conſidered as the real, though without any ill intentions on his part, enemy to the cauſe of true Chriſtianity, by incorporating it with the civil government of the world: by contemporary hiſtorians who did not embrace the religion of Chriſt, Conſtantine was compared to the moſt abhorred of thoſe tyrants, who, by their vices and weakneſs, diſhonoured the imperial purple.

Conſtantine was, in perſon, remarkably tall, of a comely and majeſtic preſence, and great bodily ſtrength. The general tenor of his life proves that he was a perſon of no mean capacity: the atchievements and ſucceſs of Conſtantine do not belong to men of weak and irreſolute minds. His mind indeed was equal to his fortune, great as it was: his valour was tried and approved frequently in his youth, and was conſpicuous on all proper occaſions throughout his whole life: his chaſtity, juſtice, and prudence, are commended by thoſe of his biographers, who, on account of a difference in religion, were not diſpoſed to flatter him: his many acts of bounty to the poor, and his juſt edicts are arguments of a merciful diſpoſition, and a love of juſtice. According to Euſebius the palace of Conſtantine was converted into a church; and the emperor himſelf chearfully led the way to thoſe that aſſembled there with him. Taking the ſacred books into his own hands, he attentively read and meditated upon the divine oracles; and then recited the uſual prayers with thoſe who were met together. Conſtantine beſides prayed daily in private in his cloſet. In time of war he had a chapel at a ſmall diſtance from his camp for the performance of religious duties, eſpecially before battle, ſeeking thereby the divine protection and bleſſing. He taught even his heathen ſoldiers a form of prayer, in which they worſhipped the one true God. Theſe and many other inſtances of the Chriſtian temper are aſcribed to the emperor by Euſebius. By our own hiſtorian, the early part of his life is highly panegerized: "He delighted," ſays Mr. Gibbon, "in the ſocial intercourſe of familiar converſation; and though he might ſometimes indulge his diſpoſition to raillery with leſs reſerve than was required by the ſevere dignity of his ſtation, the courteſy and liberality of his manners gained the hearts of all who approached him. The diſadvantage of an illiterate education had not prevented him from forming a juſt eſtimate of the value of learning; and the arts and ſciences derived ſome encouragement from the munificent protection of Conſtantine. In the diſpatch of buſineſs, his diligence was indefatigable; and the active powers of his mind were almoſt continually exerciſed in reading, writing, or meditating: in giving audience to ambaſſadors, and in examining the complaints of his ſubjects. Even thoſe who cenſured the propriety of his meaſures were compelled to acknowledge, that he poſſeſſed magnanimity to conceive, and patience to execute, the moſt arduous deſigns, without being checked either by the prejudices of education, or by the clamours of the multitude. In the field, he infuſed his own intrepid ſpirit into the troops, whom he conducted with the talents of a conſummate general; and to his abilities, rather than to his fortune, we may aſcribe the ſignal victories which he obtained over the foreign and domeſtic foes of the republic. He loved glory, as the reward, perhaps as the motive, of his labours. The boundleſs ambition, which, from the moment of his accepting the purple at York, appears as the ruling paſſion of his ſoul, may be juſtified by the dangers of his own ſituation, by the character of his rivals, by the conſciouſneſs of ſuperior merit, and by the proſpect that his ſucceſs would enable him to reſtore peace and order to the diſtracted empire." As he advanced in life, his character was leſs reſpectable, his actions leſs honourable. The oſtentatious grandeur of his court, and his magnificent buildings, were ſupported by taxes which bore very heavily on the people, and in his old age he was charged with prodigality and rapacity. Eutropius ſays, that Conſtantine, "in the early parts of his reign, might be compared to the beſt princes, in its concluſion to the indifferent ones." And Dr. Lardner, who took great pains to underſtand and appreciate the worth of this emperor, obſerves, with his uſual candour, that "we ſhould be willing to make allowances in favour of princes, and eſpecially of long reigns. It is next to impoſſible for human wiſdom and diſcretion, in the courſe of many years filled with action, not to be ſurpriſed into ſome injuſtice, through the bias of affection, or the ſpecious ſuggeſtions of artful and deſigning people. Though, therefore, there may have been ſome tranſactions in this reign which cannot be eaſily juſtified, and others that muſt be condemned, yet we are not to conſider Conſtantine as a cruel prince or a bad man." Gibbon. Lardner. Jortin. Univer. Hiſt.

Constantine II., the eldeſt of the three ſons of Conſtantine the Great, was born in the year 316, and, by the indulgence of his father, was admitted at a very tender age to ſhare the adminiſtration of the empire. He and his brothers may be ſaid to have ſtudied the art of reigning at the expence of the people entruſted to their care. During his father's life-time, the younger Conſtantine was appointed to hold his court in Gaul: and upon his death in 337, he ſucceeded to the government of Gaul, Spain, and Britain; to him alſo was aſſigned the city of Conſtantinople, with a certain ſuperiority of rank above his brothers. During his ſhort reign, he did little that has been deemed worthy of hiſtorical record. Diſſatisfied with the ſhare of empire allotted to him, he was deſirous of poſſeſſing the provinces of Africa, which had been given to Conſtans. His ſolicitations were in vain: determining, therefore, to wreſt by force, what he could not obtain by argument, at the head of a tumultuary band, he invaded the dominions of Conſtans, and laid waſte many parts of the country. The meaſures of his brother were directed with more prudence; and Conſtantine, by too great eagerneſs, was betrayed into an ambuſcade, which had been concealed in a wood, where he and his attendants were ſurrounded and ſlain, A. D. 340. His body was afterwards found in the obſcure ſtream of Alſa, and obtained a place in the imperial ſepulchre; but his provinces transferred their allegiance to the conqueror. Contemporary hiſtorians ſpeak of Conſtantine as a prince of great accompliſhments; but his conduct towards his brother met with a puniſhment which neither merited nor obtained the pity of ſurvivors.

Constantine III., the next emperor of this name, was the ſon of Heraclius by Eudoxia, and ſucceeded his father in 641. Of him more cannot be well ſaid than that he reigned three months, and died in his 30th year, either by diſeaſe, or by poiſon, ſuppoſed to have been adminiſtered by his mother-in-law.

Constantine IV. ſucceeded his father, Conſtans II., in the year 668. Very ſoon after he came to the throne, he went to Sicily, with a view of puniſhing his father's murderers, and to depoſe the uſurper whom they had eſtabliſhed. His enterprize was ſucceſsful: but upon his return to Conſtantinople, he was ſcarcely recognized, on account of the alteration in his beard; hence he obtained the appellation of the *bearded*. In this reign the Saracens invaded Africa, Sicily, and Cilicia, and at length laid ſiege to Conſtantinople. Their attempts were completely baffled, and their loſs in men was very conſiderable. The emperor, however, became tributary to the Bulgarians, who ſucceſsfully invaded ſome of his territories. This prince, who died in the year 685, appears to have poſſeſſed a ſmall ſhare of talent, intermixed with cunning and cruelty. On his two brothers he had beſtowed the empty title of Auguſtus, unconnected with truſt or power. At their ſecret inſtigation, the troops of the Anatolian province approached the city on the Aſiatic ſide, demanding for their royal brothers the partition or exerciſe of ſovereignty, and ſupported their claims by a theological argument. "We are Chriſtians," they ſaid, "the ſincere votaries of the holy and undivided Trinity: ſince there are three equal perſons in heaven, there ſhould be three equal perſons on earth." The emperor invited them to a friendly conference, in which they might propoſe their arguments to the ſenate: they obeyed the ſummons; but the view of their bodies, hanging on the gibbet in the ſuburb of Galatea, reconciled their companions to the unity of the reign of Conſtantine. He pardoned his brothers; but on the repetition or ſuſpicion of a ſimilar offence, the obnoxious princes were deprived of their titles and noſes, that the deformity might diſqualify them from the empire. In the cloſe of life, Conſtantine was anxious to eſtabliſh the right of primogeniture; and the eldeſt ſon was exalted to the rank of Auguſtus, and the aſſurance of the empire.

Constantine V., ſon of the emperor Leo, was born in 719, and crowned in his infancy. He was ſurnamed *Copronymus*, from having polluted the baptiſmal font. During a long reign of 34 years, he ever exhibited an abhorrence of image-worſhip, which rendered him an object of hatred to the catholics, who have uſed every means in their power to tranſmit his name to poſterity in the moſt diſguſting light. Although he did not merit all the opprobria affixed to his character by eccleſiaſtical bigots, yet he undoubtedly exerciſed much cruelty towards the party which reſiſted his attempts for reform in the church. Some were put to death, others mutilated, and not a few underwent leſs ſevere puniſhments. As a general, he exhibited much prudence and courage. Soon after his acceſſion he marched againſt the Saracens, who had made an irruption into Aſia; and his brother-in-law, taking advantage of his abſence, placed himſelf at the head of the orthodox faction, and was declared emperor. A civil war enſued, in which Conſtantine was victorious: the metropolis ſurrendered to its lawful ſovereign, and the uſurper and his ſon were deprived of their ill-gotten power, and of their eyes. When every thing at home was ſettled to his ſatisfaction, he made war again upon the Saracens, took their ſtrong places, and deſtroyed their fleet. In the midſt of his ſucceſſes, an earthquake, and a peſtilence among his own people, were calamities which excited in him the greateſt conſternation. After this he was attacked by the Bulgarians, by whom he was ſo completely defeated, that he was obliged to ſeek refuge in his capital: but in another attack, victory determined for Conſtantine, who cut off the invaders, with ſcarcely any loſs. As he was proceeding on a new expedition againſt the ſame people, he was ſeized with a fever, which terminated his life in 775. To the praiſe of this prince, his enemies admit that he reſtored the ancient aqueduct, a work of great importance to the inhabitants of Conſtantinople. He redeemed nearly three thouſand captives: and under his reign, plenty was the characteriſtic of the times. Moreri. Gibbon. Univer. Hiſt.

CONSTANTINE VI., grandſon of the preceding, was born in 770; and when only five years of age, he was aſſociated with his father, Leo IV., in the government: but neither then, nor in 780, when he ſucceeded entirely to the throne, was he capable of efficient buſineſs. His mother Irene was appointed guardian to the young emperor: ſhe, naturally ambitious, and impatient of controul, was unwilling to reſign the power out of her own hands. The conteſts between the mother and her ſon were the moſt prominent features of this reign. During the childiſh years of the emperor, nothing could be better adminiſtered than the government under Irene: but when he had attained the years of maturity, by the advice of his adherents, he would fain have rewarded his mother's ſervices by perpetual baniſhment to the iſle of Sicily. Irene was too politic to be thus ſerved: ſhe retaliated upon her enemies, and obtained for herſelf almoſt an unlimited obedience. Her abuſe of victory proved detrimental to her intereſts: Conſtantine aſcended the throne ſole ſovereign, and his mother was diſmiſſed to a life of ſolitude, to the enjoyment of which her mind was by no means adapted. She was recalled to court, and ſoon obtained a certain degree of authority. The emperor was attacked and defeated by the Bulgarians; and ſuſpecting an inſurrection in favour of Nicephorus, ſon of Conſtantine V. by a ſecond marriage, he had him ſeized and his eyes put out, and the tongues of his four brothers were amputated. After this cruel puniſhment, they were doomed to perpetual impriſonment. For five years they ſubmitted to their fate: an opportunity then offered, and they made their eſcape to the church of St. Sophia, diſplaying a pathetic ſpectacle to the people. "Countrymen and Chriſtians," exclaimed Nicephorus for himſelf and mute brethren, "behold the ſons of your emperor, if you can recognize our features in this miſerable ſtate. A life, an imperfect life, is all that is ſpared: this is now threatened, and we appeal to your compaſſion." Their wretchedneſs affected the people, but the miniſter of Conſtantine contrived to ſoothe their miſeries, and draw them from public view. They were ſpeedily embarked for Greece, and Athens allotted to them as a place of exile. Once more they eſcaped from the hands of their keepers, and appeared in purple at the gates of Conſtantinople. This was their laſt effort: in attempting to gain a crown, they loſt their lives. Irene ſoon found an opportunity of exciting diſcontents, with a view of depoſing her ſon. Suſpecting his danger, he attempted to eſcape to the provinces, but was ſeized on the Aſiatic ſhores, and carried priſoner to his own palace, where, in the very chamber in which he was born, the emiſſaries of his unnatural and infamous mother aſſaulted him in his ſleep, and plunged their daggers in his eyes. In this ſtate he ſurvived many years, to reflect on his own cruelty, and to learn the uſurpations of Irene.

CONSTANTINE VII. was ſon of the emperor Leo VI., and nephew to Alexander, whom he ſucceeded in 912, being but ſeven years of age. During his minority, Romanus Lecapenus, a ſucceſsful general, got poſſeſſion of the emperor's perſon, and perſuaded him to marry his daughter. He then aſſumed the royal purple himſelf, and aſſociated his own three ſons in the imperial authority, degrading the lawful emperor to the fifth rank among the titular princes. Much, however, to the honour of Romanus, he permitted him to live unmoleſted; and the time of Conſtantine was ſpent in the ſtudy and practice of the fine arts. The fall of Romanus was occaſioned by the ambition of his own children, who effected the baniſhment of their father, and, contrary to their own expectations, elevated Conſtantine to his rightful throne. To prevent their future intrigues, the emperor's firſt act was to ſeize the conſpirators, and baniſh them to the ſame iſland and monaſtery in which they had ſo lately confined their father. Romanus met them on the beach with a ſarcaſtic ſmile, and, after a juſt reproach of their folly, ingratitude, and weakneſs, preſented his imperial colleagues with an equal ſhare of his water and vegetable diet. Conſtantine was now in poſſeſſion of the eaſtern world, which he governed, or appeared to govern, fifteen years. He was, however, devoid of that energy of character which became the ſovereign of ſo mighty an empire. The ſtudies which had amuſed his life of comparative ſolitude, were not eaſily exchanged for the ſerious and important duties of a monarch. The reins of government he entruſted to his wife Helena, while he employed much of his time in the inſtruction of his ſon Romanus, and in drawing up a treatiſe for his immediate benefit, but of which he made ſo ill a uſe, that he is ſuſpected of having adminiſtered poiſon to his father, in order to ſucceed him in the empire. The death of Conſtantine was regretted by his ſubjects, who paid every demonſtration of reſpect to his deceaſed corpſe, which, according to uſual cuſtom, lay in ſtate at the palace. Before the proceſſion moved to the ſepulchre, an herald proclaimed the awful admonition: "Ariſe, O king of the world, and obey the ſummons of the King of kings."—One of the depoſed ſons of Romanus had, during his ſhort-lived authority, aſſumed the title of CONSTANTINE VIII.: of him therefore enough has been ſaid;—and we proceed to the reign of CONSTANTINE IX., who, in conjunction with his brother, Baſil II., ſucceeded to the throne, on the death of John Zimiſces, in the year 976. During the long life of Baſil, Conſtantine had only the name of emperor: all emanated from his brother. After his deceaſe, Conſtantine enjoyed, about three years, the power, or rather the pleaſures, of royalty; and his chief care was the ſettlement of the ſucceſſion. He had poſſeſſed, ſixty-ſix years, the title of Auguſtus; and the reign of the two brothers is the longeſt and moſt obſcure of the Byzantine hiſtory. He ended his inglorious life in 1028, at the age of ſeventy.

CONSTANTINE X. was ſurnamed *Monomachus*, the ſingle combatant, which was probably expreſſive of his valour and victory in ſome public or private quarrel. He was a Greek of noble extraction, and recalled from exile in Leſbos to ſucceed Michael V. He was at that time married to Zoe, the daughter of Conſtantine IX. With her, who had already been wife to two emperors, he was diſſatisfied, and took, as concubine, a widow, to whom he gave the title of Auguſta. This reign was diſturbed by various revolts, in which the emperor was uſually victorious. He was ſucceſsful alſo againſt his foreign enemies; but his indolence or avarice gave the Turks an opportunity of gaining a footing in Aſia Minor. He died in 1054. The health of this emperor had, during the greater part of his life, been broken by the tortures of the gout, and his reign was ſpent in the alternatives of ſickneſs and pleaſure.

CONSTANTINE XI. ſurnamed *Ducas*, was choſen by the emperor Iſaac Comnenus, as the fitteſt perſon to ſucceed him, when he voluntarily laid down the crown in 1059. The beginning of his reign was afflicted by a conſpiracy of his own people againſt him. Having quelled this, he began to turn his attention to government, for which he ſeems to have been very unequal. By the principles of avarice, he neglected the maintenance of his garriſons on the frontiers, and the Uxians, a people of Scythia, taking advantage of this circumſtance, paſſed the Danube, and laid waſte the country. They penetrated into Greece, and defeated the imperial generals, who had been ſent againſt them. Conſtantine would have gladly purchaſed peace, on any terms; they, however, diſdained to treat, and were finally ſtopped in their victorious career, by peſtilence, and the arms of the Bulgarians, circumſtances which deſtroyed the greater part of the number, that in the outſet amounted to nearly half a million of ſouls. During this reign an earthquake did much damage to the empire. Conſtantine died at the age of 60 years, having previouſly ſecured the ſucceſſion of his three ſons. Of theſe one aſſumed the title of CONSTANTINE XII.; but his glory was merely nominal, and loſt in that of his elder brother Michael. Of the eleventh CONSTANTINE, hiſtorians ſay he was an orthodox and juſt prince, but the ſlave of avarice. The XIIIth prince of this name was ſon of the emperor Manuel Palæologus, and ſucceeded his brother John in 1448, at a period when the whole empire ſcarcely extended beyond the limits of the capital. This ſovereign having ſquandered the ſmall remaining reſources of his dominion in imperial oſtentation, found himſelf threatened with the hoſtility of his potent neighbour, ſultan Mahomet II., who erected a fortreſs on the Boſphorus, found occaſion for a quarrel, and laid ſiege to the capital. Conſtantine determined to reſiſt to the laſt, and to ſhare the fate of his people. He ſought for ſuccour among the Chriſtian princes of the Weſt, but the aid he obtained was tardy, and inſufficient to the greatneſs of the occaſion. Conſtantinople was encompaſſed by Turkiſh arms, and the emperor, in this extremity, fulfilled the part of a hero. When the final aſſault was prepared, he took leave of his people in a moving harangue, received the ſacrament in the church of St. Sophia, and then went to the walls. The numbers of the Turks without, exceeded thoſe of the Chriſtians within, the city, more than a hundred fold. Every hope of ſucceſsful reſiſtance was vaniſhed; breaches had been made in the walls, and at length they and the towers were covered with ſwarms of the aſſailants. Amidſt theſe multitudes, the emperor, who nobly accompliſhed all the duties of a general and ſoldier, was long ſeen, and finally loſt; his mournful exclamation was heard, "Cannot there be found a Chriſtian to cut off my head?" His laſt fear was that of falling alive into the hands of the infidels. He had thrown off the purple, and falling by an unknown hand, was buried under a mountain of ſlain. The final cataſtrophe of the Greek empire, and emperor, happened May 29th, 1453, Conſtantinople having ſuſtained a ſiege of 58 days. See CONSTANTINOPLE. Moreri. Gibbon. Univer. Hiſt.

CONSTANTINE, FLAVIUS JULIUS, from a private ſoldier, in the legions of Britain, was raiſed to imperial honours, on account of his name, and in reſpect for the great Conſtantine. He had no ſooner attained the high honour, than he paſſed over to Gaul with his troops, and made himſelf maſter of that country. With the aſſiſtance of his ſon Conſtans, he reduced Spain; and upon Conſtans he conferred the title of Auguſtus. Conſtantine fixed his throne at Arles, and when the Goths under Alaric had taken poſſeſſion of Italy, he marched as far as the Po, on the pretence of effecting its deliverance, but probably with a view of ſharing in the ſpoil. After paſſing through various ſcenes, in which he experienced by turns ſucceſs and diſaſter, Conſtantine was beſieged in his capital by Conſtantius, to whom he ſurrendered, on the promiſe of ſecurity for himſelf and his ſon. The terms were granted, but the engagement was not fulfilled. The fallen prince was ſent to Italy, where he and his ſon Julian, in violation of a ſolemn promiſe, ſuffered death by the emperor's orders, Sept. the 18th, 411. Moreri. Gibbon.

CONSTANTINE: there were two popes of this name: the one a native of Syria, raiſed to the Roman ſee in 708, characterized for his charity to the poor; and for his ambition, in engaging Juſtinian to ſubjugate the independent ſee of Ravenna to the yoke of Rome; the other, from a layman, was raiſed to the higheſt office in the church by the influence of his brother; an honour, however, that he did not long retain. An inſurrection being excited againſt him, in about a year after his elevation, he was depoſed, and, under the reign of the new pope, was ſubject to the inſults and moſt cruel treatment of the people, deprived of his ſight, and condemned to perpetual impriſonment. Moreri.

CONSTANTINE is the name likewiſe of an abbot who flouriſhed at Metz in the eleventh century, and who was author of "The Life of Adalberon II." biſhop of that city: and of a monk diſtinguiſhed for his writings in the thirteenth century, againſt Veccus, patriarch of Conſtantinople. Another of the ſame name was born at Florence, and became biſhop of Orvieto. He acquired celebrity by his preaching talents, and after his elevation to the biſhopric, he was appointed legate from pope Alexander IV. to Theodore Laſcaris, the Grecian emperor, hoping, by his perſuaſion, to induce the emperor and his clergy to ſubmit to the Roman ſee. He was author of the life of St. Dominic, and other works. He died in the year 1257.

CONSTANTINE, ſurnamed the *African*, was born at Carthage, about the middle of the eleventh century. He reſided many years in Babylon, where he became celebrated for his knowledge in the Arabian, Chaldean, Perſian, and Ægyptian languages. Among the ſciences, medicine ſeems to have received the greateſt ſhare of his attention, as appears by two of his works, which were thought deſerving of being printed ſeveral centuries after his death. In the firſt, which was publiſhed at Bale, in the year 1536, in folio, "De morborum cognitione, et curatione," libri ſeptem, he treats of affections of the ſtomach, hypochondriaſis, on the diſeaſes of women, &c. In the ſecond, which was alſo publiſhed at Bale, three years after the former, he treats of fevers, of the elephantiaſis, of incantations, and of remedies taken from parts of animals. The whole are however ſuppoſed to have been principally tranſlated from Arabian writers. After a reſidence of thirty nine years at Babylon, he returned to Carthage, but ſoon fell into ſuch diſgrace with his countrymen, whom he ſuſpected of intending to deſtroy him, that he went to Salernum. Though he was there introduced to duke Robert, who wiſhed to retain him about his perſon, preferring a life of eaſe and retirement, he entered into a monaſtery of the Benedictines, St. Agatha, in Averſa, where he died in 1087. Haller Bib. Med. Eloy Dict. Hiſt.

CONSTANTINE, ROBERT, a native of Caen in Normandy, was born, as it is ſaid, about the year 1502. He was profoundly verſed in Greek, Latin, and oriental literature. This procured him the intimacy of J. Cæſar Scaliger (with whom he reſided ſeveral years), and of other great ſcholars, but did not defend him againſt the ſarcaſms of Joſeph Scaliger, who attacked him with great ferocity. He took his degree of doctor in medicine, but from the many learned works he publiſhed, does not ſeem to have dedicated much of his time to the practice of that art. His editions, with annotations, of the works of Theophraſtus, Dioſcorides, Celſus, and Quintus Serenus, gained him much credit. They were publiſhed between the years 1554 and 1566, as was alſo his "Nomenclator inſignium Scriptorum, quorum libri extant vel manuſcripti, vel impreſſi," 8vo. But the work which eſtabliſhed his name as a ſcholar, was his "Lexicon Græco-Latinum," firſt publiſhed at Geneva, in 1562, in two volumes folio; reprinted, much improved, in 1592. He is ſaid by De Thou to have lived to the great age of 103 years, preſerving his faculties entire to the laſt. Other writers ſay he died of a pleuriſy at the age of 75 years. Haller. Bib. Bot. Eloy Dict. Hiſt.

CONSTANTINE, ANTONY, an eminent phyſician at Lyons, publiſhed in 1597, in 8vo. "Brief traité de la Pharmacie Provençale, et familiere," in which he attempts to ſhew his countrymen, that they may find in their fields remedies for their diſeaſes, without having recourſe to drugs imported from foreign countries. Alſo "Opus Medicæ prognoſeos, in quo omnium ſymtomatum, cauſæ et eventus exponuntur." 8vo. 1613. He died, far advanced in years, in 1616. Eloy Dict. Hiſt.

CONSTANTINE, *Order of*, in *Heraldry*, otherwiſe the order of the Golden Angel and St. George. Conſtantine the Great is by ſome conſidered as the founder of this order, after his memorable victory over the tyrant Maxentius, A. C. 312. This is at preſent the ſecond order of the kingdom of Naples. Others affirm that the emperor Iſaac Angelus Comnenus was the founder of it. The badge of the order is a red croſs, ſomewhat in the form of four fleurs-de-lis joined at the extremities, ſurrounded with a border of gold, thereon embroidered the four letters I. H. S. V.; meaning, "In hoc ſigno vinces," being the words diſplayed on the celeſtial meteor, or luminous croſs, which is ſaid to have appeared to Conſtantine, and encouraged him to attack Maxentius. In the centre of the badge is a monogram, or cypher of our Saviour's name, expreſſed by the letters X and P, and on each ſide are placed one of the letters A and Ω (alpha and omega, or the firſt and the laſt letters of the Greek alphabet.)

The great collar of this order, worn over the mantle, conſiſts of fifteen enamelled golden ſhields of an oval form, and on each the letters X and P appear in the form of a cypher. The middle ſhield is ſomewhat larger than the others, and is ſurrounded with oak and laurel leaves entwined; and from the lower part of it is ſuſpended the effigy of St. George, in compleat armour, on horſeback, and in the act of ſtriking the dragon.

The council of this order is compoſed of 50 ſenators, who are grand croſſes. When the grand maſter aſſiſts in ſtate therein, his dreſs is as follows: the veſt and ſmall cloaths are of imperial ſcarlet, as alſo the ſtockings and ſhoes; above the veſt is worn a caſſock of ſilver, richly embroidered, with wide ſleeves, and reaching to the knees, faſtened round the waiſt with a girdle of ſcarlet velvet, embroidered with ſilver, and about the neck with two rich cords of gold and ſcarlet ſilk mixed, with taſſels reaching to the ground. On the left ſide of the mantle, the croſs of the order is richly embroidered in gold. The cap is of crimſon velvet, and is one ſpan high, lined with white ſatin, and adorned with a black oſtrich feather. The four ſides are turned up, and on each the cypher of our Saviour, as above deſcribed.

The grand croſſes (in number 50) wear a blue veſt and ſmall cloaths, and over the ſame a white veſt, which reaches to the knees; their ſtockings and ſhoes are white; their girdle red, and their mantle of blue damaſk is lined with white: they wear the great collar of the order, and their cap, which is of blue ſatin, is turned up at the four ſides, and on each the cypher as before: the cap is alſo adorned with a white oſtrich feather.

The popes had conferred the grand maſterſhip on the houſe of Comnenus for ever; but in 1699 Angelus Flavius Comnenus, the laſt of this houſe, reſigned it to Francis Farneſe, the then duke of Parma, to him and his ſucceſſors for ever; which was confirmed by a brief of pope Innocent XII. dated 29th October, 1699. In 1735 the ducal houſe of Farneſe becoming extinct in the male line by the death of Anthony the laſt duke, Don Carlos, the eldeſt ſon of Philip V. king of Spain, and of Elizabeth Farneſe, the ſole heireſs of the family, ſucceeded to the duchies of Parma and Placentia, and to the grand maſterſhip of this order. This prince was ſucceſſively grand duke of Tuſcany, and king of Naples: upon his ſucceſſion to the latter he declared this order royal, and annexed it to the crown of Naples.

CONSTANTINOPLE, in *Geography*, the metropolis of the Turkiſh empire, was built on the ſcite and ruins of the ancient *Byzantium* in Thrace, by the Roman emperor Conſtantine the Great, who, in the year of our Lord 330, removed the ſeat of the empire from Rome to this new capital. The reaſons which induced Conſtantine to fix his reſidence here, are not exactly known. The imperial court had in fact been removed from Rome about thirty years before. Of the aſſociate emperors Diocletian and Maximian, the former reſided at Nicomedia, and the latter moſtly at Milan. Galerius had his court at Nicomedia; Conſtantius Chlorus at York. It is ſuppoſed that Diocletian and Maximian, having concerted a plan of adminiſtration more ſyſtematically deſpotic than that of any of the preceding emperors, and being deſirous of ſetting entirely aſide the nominal authority which the ſenate ſtill poſſeſſed, had fixed their reſidence at a diſtance from the ancient metropolis of the empire, in order to avoid the republican remonſtrances of that auguſt body. Conſtantine was probably actuated by the ſame motive, for his adminiſtration was ſtill more deſpotic; and after he had removed the ſeat of empire to Conſtantinople, the ſenate could ſcarcely be reckoned a conſtituted order in the ſtate. Others attribute Conſtantine's choice of a new capital to a diſlike which he had conceived againſt Rome, on account of the enthuſiaſtic attachment of that city to paganiſm. But whatever may have been Conſtantine's motive, it cannot be denied that the ſituation of Conſtantinople actually was preferable to that of Rome, both as a check to the Perſians, and as a barrier againſt the Goths, thoſe terrible enemies of Rome, who, having once taſted the rich plunder of Greece and Aſia Minor, ſeized every opportunity of making predatory incurſions into all parts of the empire. Beſides, the beautiful and pictureſque arrangement of the land and water in the environs of Conſtantinople decidedly entitled it to be preferred to Rome. It is ſituated on an elevated ground, conſiſting of gently ſwelling eminences, riſing like terraces, one above another, without any of thoſe deep vallies which ſeparate the ſeven hills on which Rome is ſeated, and which, together with the marſhes adjoining the Tyber, render the air unwholeſome. It fills a triangle formed by the harbour, the BOSPHORUS and the PROPONTIS, or ſea of MARMORA. Situated in the 41ſt degree of latitude, the imperial city commanded, from her ſeven hills, the oppoſite ſhores of Europe and Aſia; the climate was healthy and temperate, and the ſoil fertile, and the approach on the ſide of the continent was ſmall in extent, and eaſy of defence. The harbour on the north ſide is ſecure and capacious; it is five hundred yards wide at its entrance from the Boſphorus, and runs ſeven miles into the land. The Boſphorus and the Helleſpont may be conſidered as the two gates of Conſtantinople; and the prince who poſſeſſed thoſe important paſſages could always ſhut them againſt a naval enemy, and open them to the fleets of commerce when thoſe gates were ſhut. The capital ſtill enjoyed within their ſpacious encloſure every production which could ſupply the wants, or gratify the luxury, of its numerous inhabitants. In ſailing up the Propontis towards Conſtantinople the moſt enchanting proſpects charm the eye of the navigator; from every part of that ſea he may diſcover the high lands of either Thrace or Bithynia, and never loſes ſight of mount Olympus, till at laſt the city itſelf, riſing from the Strand, attracts his view, and exhibits the moſt magnificent appearance. Conſtantinople alſo commands the commerce of the vaſt regions of the north, by means of the Euxine ſea, and of the rivers Don and Dnieper, which diſcharge themſelves into it. By the ſtrait of the Helleſpont, which forms the communication between the Propontis and the Mediterranean ſea, it is equally well ſituated for the trade of the ſouth and weſt; and when Egypt is under its dominion its poſition is extremely advantageous with reſpect to the trade to India, and the eaſtern coaſts of Africa.

Whatever rude commodities were collected in the foreſts of Germany and Scythia, as far as the ſources of the Tanais and Boryſthenes; whatſoever was manufactured by the ſkill of Europe or Aſia; the corn of Egypt, and the gems and ſpices of the fartheſt India, were brought by the varying winds into the ports of Conſtantinople, which for many ages attracted the commerce of the ancient world.

The proſpect of beauty, of ſafety, and of wealth, united in a ſingle ſpot, was ſufficient to juſtify the choice of Conſtantine. However, as prodigy and fable have, in every age, been ſuppoſed to reflect a becoming majeſty on the origin of great cities, the emperor thought proper to avail himſelf of this circumſtance; and in one of his laws he has taken care to inform poſterity, that in obedience to the commands of God, he laid the everlaſting foundation of Conſtantinople. The ingenuity of ſucceeding writers has led them to deſcribe the nocturnal viſion which appeared to the fancy of Conſtantine as he ſlept within the walls of Byzantium. The tutelar genius of the city, a venerable matron, ſinking under the weight of years and infirmities, was ſuddenly tranſformed into a blooming maid, whom his own hands adorned with all the ſymbols of imperial greatneſs. The monarch awoke, interpreted the auſpicious omen, and, without heſitation, obeyed the will of heaven. In order deeply to impreſs the minds of the ſpectators, the emperor himſelf, on foot, with a lance in his hand, led a ſolemn proceſſion, and directed the line, which was traced as the boundary of the deſtined capital, till the growing circumference was obſerved with aſtoniſhment by the aſſiſtants, who, at length, ventured to obſerve that he had already exceeded the moſt ample meaſure of a great city. "I ſhall ſtill advance," replied Conſtantine, "till HE, the inviſible guide who marches before me, thinks proper to ſtop." In ſurveying the actual ſtate of the city, the palace and gardens of the ſeraglio occupy the eaſtern promontory, the firſt of the ſeven hills, and cover about 150 acres of our meaſure. The new walls of Conſtantine ſtretched from the port to the Propontis acroſs the enlarged breadth of the triangle, at the diſtance of fifteen ſtadia from the ancient fortification; and with the city of Byzantium they encloſed five of the ſeven hills, which, to the eyes of thoſe who approach Conſtantinople, appear to riſe above each other in beautiful order. About a century after the death of the founder, the new buildings, extending on one ſide up the harbour, and on the other along the Propontis, already covered the narrow ridge of the ſixth, and the broad ſummit of the ſeventh hill. The inceſſant inroads of the Barbarians rendered it neceſſary for Theodoſius the younger to ſurround his capital with an adequate and permanent encloſure of walls. The new wall of Theodoſius was conſtructed in the year 413; and after having been thrown down by an earthquake in 447, it was rebuilt in three months by the diligence of the prefect Cyrus. The ſuburb of the Blachernæ was firſt taken into the city in the reign of Heraclius. From the eaſtern promontory to the golden gate, the extreme length of Conſtantinople was about three Roman miles; the circumference meaſured between ten and eleven; and the ſurface might be computed as equal to about 2000 Engliſh acres. The ſuburbs of Pera and Galata, though ſituate beyond the harbour, may deſerve to be conſidered as a part of the city; and this addition may perhaps authorize the meaſure of a Byzantine hiſtorian, who aſſigns ſixteen Greek (about fourteen Roman) miles for the circumference of his native city. After all, Conſtantinople muſt yield to Babylon and Thebes, which filled the great but not incredible circumference of about 25 or 30 miles, to ancient Rome, to London, and even to Paris.

As to the expence incurred by the progreſs of the work, ſome eſtimate may be formed of it by the allowance of about two millions five hundred thouſand pounds for the conſtruction of the walls, the porticoes, and the aqueducts. The foreſts that overſhadowed the ſhores of the Euxine, and the celebrated quarries of white marble, in the little iſland of Proconneſus, ſupplied an inexhauſtible ſtock of materials ready to be conveyed, by the convenience of a ſhort water-carriage, to the harbour of Byzantium. A multitude of labourers and artificers urged the termination of the work with inceſſant toil; but the impatience of Conſtantine ſoon diſcovered that, in the decline of the arts, the ſkill, as well as the number of his architects, bore a very unequal proportion to the greatneſs of his deſign. However, the buildings of the new city were decorated by the hands of the moſt celebrated maſters of the age of Pericles and Alexander. By the commands of the emperor, the cities of Greece and Aſia were deſpoiled of their moſt valuable ornaments. The trophies of memorable wars, the objects of religious veneration, the moſt finiſhed ſtatues of the gods and heroes, of the ſages and poets of ancient times, contributed to the ſplendid triumph of Conſtantinople; whence the hiſtorian Cedrenus took occaſion to obſerve, that nothing ſeemed wanting except the ſouls of the illuſtrious men, whom thoſe admirable monuments were intended to repreſent. For an account of the principal buildings with which this imperial city was decorated, we muſt refer to the articles Forum, Hippodrome, &c. and the ſequel of this article.

The baths of this city, which ſtill retained the name of Zeuxippus, were enriched by the munificence of Conſtantine with lofty columns, various marbles, and above threeſcore ſtatues of bronze. In ſhort, whatever could adorn the dignity of a great capital, or contribute to the benefit or pleaſure of its numerous inhabitants, was contained within the walls of Conſtantinople. A particular deſcription, compoſed about a century after its foundation, enumerates a capitol or ſchool of learning, a circus, two theatres, eight public, and 153 private baths, 52 porticoes, five granaries, eight aqueducts or reſervoirs of water, four ſpacious halls for the meetings of the ſenate or courts of juſtice, 14 churches, 14 palaces, and 4388 houſes, which, for their ſize and beauty, deſerved to be diſtinguiſhed from the multitude of Plebeian habitations. In order to furniſh this favoured city with a population, correſponding to its extent and magnificence, Conſtantine invited many opulent ſenators of Rome, and of the eaſtern provinces, to fix upon his choſen reſidence for their own habitation; and he beſtowed on his favourites the palaces which he had built in ſeveral quarters of the city, aſſigned them lands and penſions for the ſupport of their dignity, and alienated the demeſnes of Pontus and Aſia, for the purpoſe of granting hereditary eſtates by the eaſy tenure of maintaining a houſe in the capital. By degrees, however, a variety of concurring circumſtances contributed to fill the city with inhabitants. In leſs than a century, Conſtantinople diſputed with Rome itſelf the pre-eminence of riches and numbers; and it became neceſſary to enlarge its extent by additional edifices, the foundations of which, on either ſide, were advanced into the ſea, and which, of themſelves, might have compoſed a very conſiderable city. The emperor alſo conferred, by way of additional allurement or encouragement to his plan of population, ſeveral privileges on the ſettlers at Conſtantinople. He divided the city into fourteen regions or quarters, dignified the public council with the appellation of ſenate, communicated to the citizens the privileges of Italy, and beſtowed on the riſing city the title of colony, the firſt and moſt favoured daughter of ancient Rome. The walls, porticoes, and principal edifices of this city, were completed, as ſome ſay, in a few years, or, according to others, in a few months; and the founder ſoon prepared to celebrate the dedication of his city, a ceremony which was attended with pompous games, and munificent largeſſes. As often as the birth day of the city returned, the ſtatue of Conſtantine, framed by his order, of gilt wood, and bearing in its right hand a ſmall image of the genius of the place, was enriched on a triumphal car. The guards, carrying white tapers, and clothed in their richeſt apparel, accompanied the ſolemn proceſſion as it moved through the Hippodrome. When it was oppoſite to the throne of the reigning emperor, he roſe from his ſeat, and with grateful reverence adored the memory of his predeceſſor. At the feſtival of dedication, an edict, engraved on a column of marble, beſtowed the title of Second, or New Rome, on the city of Conſtantine. But the name of Conſtantinople has prevailed over that honourable epithet, and, after the revolution of fourteen centuries, ſtill perpetuates the fame of its author.

It has been conjectured, that the removal of the imperial reſidence from Rome, contributed to haſten the downfal of the empire: but it is certain, that the fixing of it at Conſtantinople, put a final period to the paſſage of the Barbarians, through the Boſphorus. They could never after force that inſurmountable barrier, and Greece, as well as Aſia Minor, felt ſecure from their ravages, until Valens unadviſedly ſuffered the Goths to paſs the Danube, and received their armed bands into the heart of the empire.

Conſtantine the Great did not long enjoy his new reſidence. He died the 22d May, 337, and by his will divided his vaſt empire among his three ſons, Conſtantius, Conſtans, and Conſtantine. Within three years after their father's death, Conſtans invaded the dominions of his brother Conſtantine, who, being drawn into an ambuſcade and ſlain, left Conſtans in poſſeſſion of two-thirds of the Roman empire. But Magnentius revolting ſoon after againſt Conſtans, ſurpriſed him hunting, and purſuing him in his flight, put him to death. Magnentius being in the next place defeated by Conſtantius, terminated his life by ſuicide; and thus, by the diſaſtrous fate of his brothers, Conſtantius became ſole emperor in 353; three and twenty years after the ſeat of the empire had been removed to Conſtantinople.

At the death of Conſtantius, which happened in the year 361, Julian, commonly called the Apoſtate, ſon of Julius Conſtantius, and nephew to Conſtantine the Great, aſſumed the imperial purple. He marched ſoon after againſt the Perſians, and was ſo infatuated by his expectations of conqueſt, as to deſtroy the fleet of boats which he had upon the Tigris. Allured by ſpies who pretended to be deſerters, he advanced far into an unknown country. His army found itſelf at laſt in the midſt of ſandy deſerts, and felt the dreadful effects of famine. The guides ſuddenly diſappeared, and the Perſian monarch approaching, with the whole military force of his kingdom, want of proviſions rendered a retreat neceſſary, in which the troops were continually haraſſed by the Perſians, who carefully avoided any cloſe engagement. In ſpite of the inceſſant attacks of the Perſian cavalry, the Romans ſucceeded in gaining the banks of the Tigris, but for want of their boats they could not paſs the river. Exhauſted with fatigue, and periſhing with hunger, they ſtill repulſed the attack which the Perſian king made on their camp. In the confuſion of the battle, Julian received a mortal wound, of which he died in a few hours, on the 26th of June, 363.

This emperor had conceived the project of extirpating the Chriſtian religion; and if he had appointed, or if the army had elected an emperor equally averſe to Chriſtianity, his death would not have diſpelled the ſtorm that was gathering over Chriſtendom. Fortunately, Jovian, a Chriſtian officer, was choſen emperor. Forced to conclude a diſadvantageous peace with Perſia, he purchaſed a ſafe retreat by the ceſſion of Meſopotamia, and the ſtrong cities of Niſibis and Singara.

Jovian dying in 364, ſoon after the concluſion of the peace with Perſia, Valentinian, another Chriſtian commander, was decorated with the imperial purple. He named his brother Valens his colleague in the empire, aſſigning him the eaſtern part, whilſt he himſelf ruled the weſt. It was in this reign that the firſt ſtep towards the ſubverſion of the weſtern empire took place. The Huns, a Tartar nation, being driven out of their own country, ruſhed like a torrent upon the Goths, on the north ſide of the Danube, who, ſeeing their poſſeſſions invaded, preſented themſelves in immenſe crowds on the banks of the river, and requeſted an aſylum in the Roman dominions. They delivered up their children, at leaſt thoſe of rank, as hoſtages; but were unfortunately ſuffered to retain their arms. The number of Goths who paſſed the Danube on the occaſion, was computed at about 200,000 armed men, with their wives and children along with them. A ſecond army of Goths, coming to the banks of the Danube with the ſame requeſt, was refuſed: but they paſſed without leave, and being ill ſupplied with proviſions, they joined their countrymen, and commenced a war againſt the empire. After various ſkirmiſhes, Valens, without waiting for his nephew Gratian, who was on his march to join him, gave battle to the Goths, in the plains of Adrianople, A. D. 378, and was totally defeated. The loſs on the ſide of the Romans was ſo great, that this defeat was conſidered as the moſt ſevere ſince the battle of Cannæ. Valens was never more ſeen. It is ſuppoſed that he was conſumed in the flames of a cottage where he had taken refuge.

By the death of Valens, the empire fell into the hands of his nephew Gratian, who had ſome time before ſucceeded to Valentinian in the weſt. But at the end of the year 378, he declared Theodoſius his partner in the empire, and committed the Eaſt to his care.

Theodoſius was a native of Spain. In four years and a half he terminated the Gothic war. The Goths had lands aſſigned to them in the Roman provinces, and ſubmitted to the Roman ſceptre on condition of being governed by their own laws.

Theodoſius was in every reſpect a ſecond Conſtantine the Great. Like him he rendered the empire triumphant over all its enemies, extinguiſhed inteſtine commotions, eſtabliſhed Chriſtianity upon a ſolid baſis, and divided the empire between his two ſons Arcadius and Honorius, aſſigning to the former the eaſtern, and to the latter the weſtern part. From that period, the two monarchies, forming two ſeparate and independent ſtates, gradually became ſtrangers to each other, and even regarded each other's proſperity with a jealous eye. Rome fell a prey to the Goths, whilſt Conſtantinople appeared totally unconcerned at the event. Theodoſius died at Milan, the 17th of January 395, in the ſixteenth year of his reign, and the fiftieth of his age.

After the death of Theodoſius, the hiſtory of Conſtantinople affords nothing remarkable, until the total deſtruction of the Roman empire in the weſt by the Goths. Towards that time Baſiliſcus uſurped the Eaſtern empire. Aſſiſted in his conſpiracy by the empreſs Verina, his ſiſter, he drove out Zeno, the lawful emperor, who fled into Iſauria, whither he was purſued by Ilus and Trecondes, two of the uſurper's generals, and forced to ſhut himſelf up in a caſtle. But Baſiliſcus having loſt his popularity by his cruelty, his generals joined Zeno and reſtored him to the throne. Baſiliſcus periſhed in a dungeon in the year 467. He had reigned about twenty months. During his uſurpation, a dreadful fire happened at Conſtantinople; together with a conſiderable part of the city, it conſumed the imperial library which is ſuppoſed to have contained 120,000 volumes.

Zeno had the good fortune to eſcape other conſpiracies that were formed againſt him: but he was unſucceſsful in the wars which he waged againſt the Oſtrogoths, and purchaſed a ſhort peace at the expence of the provinces of Lower Dacia and Mœſia. Theodoric, king of the Oſtrogoths, ſoon renewed his irruptions into Thrace, and advanced within fifteen miles of Conſtantinople, which he was expected to beſiege, when he ſuddenly turned his arms againſt Odoacer, king of Italy, whom he ſubdued. Theodoric himſelf was proclaimed king of Italy in his room, two years after the death of Zeno, which happened in 491.

The adminiſtration of Athanaſius, Zeno's ſucceſſor, was equally weak. Theodoric, however, reigned in Italy under the ſanction of the imperial court of Conſtantinople, and ſtill acknowledged himſelf a vaſſal of the eaſtern emperor. But on his death the kingdom of Italy devolved upon his beautiful and accompliſhed daughter, Amalaſontha; and at her demiſe, which happened in the year 535, the Goths of Italy refuſed to acknowledge the paramount authority of the imperial court, and renounced all dependence on the empire. Juſtinian was then reigning at Conſtantinople. His uncle Juſtin, who aſcended the throne in 518, after Athanaſius, had named him his colleague in the year 527, and dying ſoon after, had left him ſole maſter of the empire. He firſt turned his whole force againſt Choſroes, king of Perſia, diſpatched his general Beliſarius againſt him, and after a ſevere defeat, forced him to ſue for peace.

About this time, a great tumult happened at Conſtantinople. It began among the different factions in the circus. Hypatius, nephew to Athanaſius, was proclaimed emperor. To cruſh this ſedition, Juſtinian ſacrificed two of his miniſters who were moſt obnoxious to the people; but the multitude grew the more outrageous, and ſeveral ſenators having joined the rebels, the emperor felt ſo much alarmed that he thought of abandoning the city, and making his eſcape by ſea. Encouraged, however, by his empreſs Theodora, he reſolved to defend himſelf to the laſt with the few ſenators who had not yet abandoned him. In the mean time, Hypatius was carried in triumph to the circus, where he was beholding the ſports from the imperial throne, among the acclamations of the populace, when Beliſarius on his return from Perſia entered the city with a conſiderable body of troops. He immediately marched to the circus, fell ſword in hand upon the diſarmed multitude, and took Hypatius the uſurper, and Pompey, another of the nephews of Athanaſius, priſoners. They were both beheaded, and their eſtates, as well as thoſe of the ſenators who had joined them, confiſcated.

Juſtinian now turned his arms againſt the Vandals in Africa, and the Goths in Italy. Beliſarius entered Rome A. D. 536, where he was beſieged by the Goths. His gallant defence, with only five thouſand veterans, againſt a numerous army of Goths, commanded by Vitiges their king, during the ſpace of a whole year, is deemed one of the moſt ſignal military exploits recorded in hiſtory. He made many ſucceſsful ſallies. In one ſingle aſſault the Goths are reported to have loſt 30,000 men. They were obliged to raiſe the ſiege on the arrival of freſh troops from Conſtantinople. At length the Gothic kingdom of Italy was completely ſubdued. Vitiges the king was ſent to Conſtantinople. Juſtinian aſſigned him for maintenance a rich eſtate in Aſia Minor, and on his conforming to the Athanaſian creed, conferred upon him the rank of Patrician and Senator, which ſtill continued as an honorary title in the empire. Gelimer, king of the Vandals, over whom Juſtinian alſo triumphed, had likewiſe an ample eſtate aſſigned to him, but could not enjoy any honorary title on account of his profeſſing Arianiſm.

In the year 546, the Goths again revolted under the command of Totila, whom they had elected king. Beliſarius a ſecond time entered Italy, and retook Rome in 547, but at his recal it was again captured by the Goths. The command of the army of Italy was then conferred on Narſes, an eunuch of great military ſkill and the moſt daring courage. This general defeated and ſlew Totila the Gothic king, and made himſelf maſter of Rome in 552. He likewiſe defeated and ſlew Teias, who had ſucceeded Totila as king of the Goths, and made a prodigious ſlaughter of the Franks and Allemanni, who invaded Italy ſoon after. Italy was then made a province of the eaſtern or Byzantine empire, and a government eſtabliſhed under the denomination of the Exarchate, of which Narſes was the firſt exarch.

By the conqueſt of Italy and Africa, Juſtinian gave to the eaſtern empire an aggrandizement which it had never before poſſeſſed. He diſplayed conſummate political abilities, during a reign of thirty-eight years, and exhibited, during a life of eighty-three, a ſingular inſtance of long continued perſonal proſperity. He has left a noble monument of his legiſlative talents in his code of laws, and a no leſs noble one of his ſkill in architecture, in the magnificent cathedral of St. Sophia at Conſtantinople, now a Mahometan moſque. His reign is alſo the important æra of the tranſplantation of the ſilk-worm from China to Conſtantinople. The brilliancy of Juſtinian's reign was however in ſome degree clouded by great calamities of a phyſical nature. Tremendous earthquakes happened almoſt every year throughout the whole extent of the empire. A dreadful peſtilence ſpread from Peluſium in Egypt, over the greateſt part of Aſia, Africa, and Europe. During the ſpace of three months, from five to ten thouſand individuals died daily in Conſtantinople. Many cities in the Eaſt were almoſt depopulated, and in ſome parts of Italy, the harveſt rotted on the ground. This contagion, which began in the fifteenth year of Juſtinian's reign, was not extinguiſhed in leſs than fifty-two years.

Juſtinian died in the year 565. Soon after his death the Eaſtern empire began to decline. After the ſucceſſive reigns of Juſtin II. and of Tiberius, which filled up the interval, from the death of Juſtinian to the acceſſion of Maurice in 582, a ſpirit of revolt manifeſted itſelf in Conſtantinople, and terminated in the aſſaſſination of Maurice, and election of Phocas the centurion in 602. Phocas was in his turn depoſed and put to death by Heraclius, A. D. 610, whoſe reign is remarkable for a moſt obſtinate conteſt with Perſia, to which country it proved finally fatal.

During a period of twelve years, from 610 to 622, the Eaſtern empire exhibited a ſcene of almoſt unexampled diſtreſs. From the Adriatic to the ſuburbs of Conſtantinople, the provinces were ravaged by the Chan of the Avars, who had ſubdued the Huns and reſided in the royal village of Attila, in the great plain of Hungary; and a Perſian army was encamped at Chalcedon, now Scutari, on the brink of the Boſphorus, directly oppoſite to Conſtantinople. The general conſternation was ſo great that the emperor was about to leave the city, and tranſport himſelf with the treaſures of the imperial palace to Carthage, when the patriarch of Conſtantinople led him to the altar of the church of St. Sophia, and made him take a ſolemn oath that he would live and die with his people. Heraclius having thus ſolemnly bound himſelf to the defence of his country, carried devaſtation to the very centre of the Perſian dominions. He every where defeated the numerous forces of Choſroes, whoſe continual diſaſters excited a general revolt of the Perſians. Choſroes was depoſed A. D. 628, and Siroes his ſon proclaimed king. The latter put to death his father and eighteen brothers, and then concluded with Heraclius a treaty of peace, in conſequence of which, the former boundaries of the Byzantine and Perſian empires were reſtored.

The northern nations, which had overthrown the Roman empire in the Weſt, were yet in an unſettled ſtate, and Europe exhibited the moſt diſguſting ſcene of barbariſm and anarchy, whilſt Conſtantinople was triumphing in the ſucceſsful termination of a war, which had threatened the extinction of its empire. It was, however, ſoon to witneſs horrors ſimilar to thoſe with which the Weſt had been familiarized for the ſpace of two centuries.

About the year 609, Mahomet, an Arabian, aſſumed the character of a prophet, and aſſembling together a determined and daring band, in whom he excited military enthuſiaſm by means of religious tenets, calculated to flatter their paſſions, he ſubdued one after another, all the Arabian tribes, and attacked the Eaſtern empire three years before his death. His ſucceſſor, Abubeker, preferred, however, turning his arms towards Perſia, which had not yet recovered from the confuſion into which it had been thrown, by the dreadful conteſt between Heraclius and Choſroes. But after the death of Abubeker, which happened in 634, Omar, who ſucceeded him, aſſailed the Byzantine empire, with renovated ardour. In the courſe of a very few years, both Syria and Egypt acknowledged the ſway of the conqueror. The loſs of Egypt was ſeverely felt by the people of Conſtantinople; that country having always been eſteemed the granary of the city, and Syria, being in poſſeſſion of an enemy, laid all the Aſiatic provinces open to invaſion.

In the year 644, this new Saracen empire devolved to the Caliph Othman, who completed the conqueſt of Perſia, and ſubdued all that part of Africa, which had ſucceſſively been under the dominion of the weſtern and eaſtern empire, and which extended from Egypt to the Atlantic, and from the Mediterranean to the Great Deſert.

But during the whole period of the exiſtence of the Saracen empire, Conſtantinople ſtill reſiſted all the attacks of theſe Arabian conquerors. They twice laid ſiege to the city. In their firſt attempt their fleet blockaded Conſtantinople, on the ſide of the Propontis, from 668 to 675. Their ſecond ſiege in 716, was rendered memorable by the invention of the Greek fire, which totally deſtroyed the Saracen fleet, whilſt the army which attacked the city on the land ſide, was compelled to raiſe the ſiege with prodigious loſs.

If the progreſs of Mahometaniſm was hurtful to the intereſts of Chriſtianity, and to the ſplendour of the Byzantine empire, the conteſt between the advocates of the uſe of images in Chriſtian temples and their opponents, which violently agitated the church, proved equally fatal in its conſequences. It occaſioned the firſt ſchiſm between the Greek and Latin churches, and was the origin of thoſe differences which in the end produced their total ſeparation, and haſtened the fall of Conſtantinople.

This diſpute broke out about the year 720, in the reign of Leo, the Iſaurian, who is diſtinguiſhed in hiſtory as the firſt of the Iconoclaſt emperors. A council was held at Conſtantinople in 754, by 338 prelates of the eaſtern empire, who condemned all viſible repreſentations of Chriſt and his apoſtles, as heretical. This deciſion immediately cauſed the ſeceſſion of Italy. A new Roman republic was eſtabliſhed; but not being able to maintain its independence againſt the Lombards, it was delivered from their oppreſſion by Pepin, king of France, whoſe ſon and ſucceſſor Charlemagne received from the pope Adrian IV. the title of emperor of the Romans, and founded the Holy Roman or German empire.

The decree of the council of Conſtantinople did not, however, maintain its authority for more than thirty years. Irene, an Athenian female, who for her beauty had been advanced to the imperial bed and throne, began to reign in conjunction with her ſon Conſtantine VI. in the year 780. Her ambition inſtigated her to cauſe the eyes of her ſon to be put out that ſhe might reign ſole empreſs of the Eaſt. She ſtrongly exerted herſelf in favour of the reſtoration of images, which the ſecond council of Nice, condemning that of Conſtantinople, effected in 787. Still the two churches of the Eaſt and Weſt, were never more cordially united.

During the four centuries which elapſed between the death of Theodoſius the Great and the reign of Charlemagne, Europe was in a ſtate of anarchy and barbariſm: the eaſtern empire alone exhibited marks of civilized ſociety, and for a while flouriſhed in power, till it was curtailed of half of its poſſeſſions by the conqueſts of the Mahometan caliphs. Under Charlemagne the whole world was divided into the Eaſtern, Saracen, and new Weſtern empire. Of theſe the Saracen empire, under the caliphs, ſtood the higheſt in literary attainments; Conſtantinople, though much declined, ſtill held the ſecond rank; and the reſt of Europe was making ſome advances towards the reſtoration of learning, when Charlemagne, by dividing his new empire among his ſons, replunged it into barbariſm.

In the ninth century, the Bulgarians, who had commenced their attacks towards the latter end of the ſeventh, and renewed their inroads at different periods, continued to be formidable enemies. They were completely ſubdued by Baſilius II. towards the end of the tenth century. It was about the ſame time that the empire of the Saracens, being, like that of Charlemagne, ſplit into a number of independent ſtates, by the revolt of factious and ambitious chiefs, fell a prey to the Seljukian Turks and other barbarous nations of Aſia. This ſubverſion of the caliphate was attended with the complete wreck of Arabian learning; and the Byzantine empire remained the ſole depoſitory of all that was worthy of notice in literature, commerce, and the arts and embelliſhments of civilized ſociety. Thus the tenth century, which, in the weſtern countries, was one of the darkeſt periods of Gothic ignorance, conſtituted the moſt flouriſhing æra of the Byzantine learning, under the reigns of Leo the philoſopher and his ſon Conſtantine Porphyrogenitus.

About the year 1063 the emperor Conſtantine XI. Ducas left, at his death, the empire to his three ſons, Michael, Andronicus, and Conſtantine XII., and appointed the empreſs Eudocia regent during their minority, on condition that ſhe ſhould not marry again. But having been releaſed from her engagement, through a ſtratagem practiſed upon the patriarch, who abſolved her of the oath ſhe had taken, Eudocia married an officer of great military merit, named Romanus Diogenes, who was proclaimed emperor. After various ſucceſſes againſt the Turks, who were continually encroaching upon all ſides of the empire, Romanus was wounded in a deſperate engagement, and taken a priſoner. Before his return to Conſtantinople, Eudocia was driven from the throne by John, the brother of Conſtantine Ducas, and her eldeſt ſon, Michael Ducas, proclaimed emperor. Romanus was beſieged in a ſtrong caſtle, whither he had retired, and killed in the year 1067, after a reign of three years and eight months.

Immediately after the death of Romanus, the empire was again invaded by the Turks. In leſs than ten years they made themſelves maſters of all Media, Lycaonia, Cappadocia, and Bithynia. At laſt Alexius Comnenus, having wreſted the empire from Nicephorus Botoniates, who had depoſed Michael Ducas, prepared for war with ſo much vigour, that Solyman the Turkiſh ſultan made propoſals of peace, to which Alexius acceded, in order to defend himſelf in the weſt againſt the Italians, under Robert Guiſchard, duke of Puglia and Calabria, whom he defeated, with the aſſiſtance of the Venetian fleet. He alſo forced the Scythians, who had laid waſte great part of Thrace, to ſubmit on his own terms.

The war with the Turks was renewed in 1083, and carried on with various ſucceſs. But about the year 1095, a romantic ſcene of religious enthuſiaſm and military enterpriſe began to diſplay itſelf; and though it threatened the utter ruin of the Turkiſh nation, proved finally fatal to Conſtantinople.

Under the poliſhed empire of the caliphs, the frequent pilgrimages of Chriſtians to the holy ſepulchre at Jeruſalem had been encouraged; but the barbarians who had overturned the caliphate oppreſſed the pilgrims with unreaſonable impoſitions, and often added inſult to injuſtice. Incenſed at theſe outrages, Peter, a hermit, who had viſited the holy ſepulchre, preached a cruſade for the recovery of the holy land from the infidels. The pope approved the project, and the princes and nobles of Europe readily entered into the meaſure.

This religious war was carried on, with ſome intervals, during the ſpace of almoſt two hundred years, from the ſetting out of the firſt cruſade in 1095, to the loſs of Acre and all Paleſtine in 1291. Innumerable armed hordes were collected out of England, France, Germany, the Netherlands, and Italy. Yet theſe tremendous efforts were not attended with effects of ſuch permanency as might have been expected. But one of the moſt remarkable events which occurred in the courſe of the cruſades, was the capture of the city of Conſtantinople by the Latins.

The emperor, Iſaac Angelus, having been depoſed and deprived of ſight by his inhuman brother, his ſon, Alexius, who was only a youth, made his eſcape into Italy, and met with a number of the barons of France and Flanders, who were come to Venice to contract with the republic for the ſhips neceſſary to facilitate one of thoſe cruſading enterpriſes. He concluded with them a treaty, whereby they engaged to reſtore his father to the imperial throne of the Eaſt, and he promiſed to unite the Greek to the Latin church. The French and Venetians, changing the deſtination of their armament, ſailed up the Helleſpont to Conſtantinople, broke the chain of the harbour, and aſſaulted the city. When they were almoſt ready to enter the town, the uſurper made his eſcape. Iſaac Angelus and his ſon, the young Alexius, were proclaimed joint emperors. A ceſſation of arms took place: but as ſoon as the clergy underſtood the terms of the treaty concluded by young Alexius, they reprobated the idea of an union with the ſee of Rome, and excited the people to fly to arms. The inſurrection was alſo fomented by Alexius Mourzouſle, of the family of Ducas, who aſſumed the purple, impriſoned the blind emperor Iſaac, and put young Alexius to death. The legal ſucceſſion of the Greek empire being thus overturned, the French and Venetians recommenced the war. After a ſiege of more than three months, they aſſaulted the city from the harbour, and carried it by ſtorm, eight hundred and eighty years after its foundation by Conſtantine. The city being given up to pillage, the plunder was valued at 400,000 marks, nearly equivalent to 800,000*l.* ſterling, the greateſt ſum ever found in any captured city previous to that period; and notwithſtanding the penalties of excommunication, and even of death, denounced againſt any one who ſhould ſecrete any part of the ſpoil, the ſecret plunder is ſuppoſed to have exceeded what was produced in public. Baldwin, earl of Flanders, was elected emperor, with one-fourth part of the empire for his ſhare: the reſt was divided among the barons and knights, into fiefs, held under the emperor.

The Greeks, after this diſaſter, eſtabliſhed independent ſtates at Nice, Trebiſond, and Epirus. The Latins were not proſperous in their newly-acquired empire. The diſſentions which prevailed among the barons, laid their dominions open to the attacks of the Greeks. They continually gained ground. The Bulgarians alſo revolted, and the emperor, Baldwin of Flanders, being defeated and taken priſoner by them, died in captivity. He was ſucceeded by his brother Henry, who ſhewed himſelf of equal capacity for peace and war.

Henry checked the proceedings of the popiſh legate, in the perſecution of the Greek ſchiſmatics. But after his death, which happened in 1216, the Latin empire of Conſtantinople rapidly declined: and ſo preſſing were the exigencies of the ſtate, that Baldwin II., the laſt emperor of the Latin dynaſty, pledged to the Venetians the crown of thorns pretended to have been worn by Chriſt.

At laſt Michael Paleologus, having uſurped the Greek empire of Nice, his general, Alexius Strategopulus, with an inconſiderable force, ſurpriſed and recovered Conſtantinople in 1261: and thus, after a period of 57 years, that metropolis returned under the dominion of the Greeks. But a conſiderable part of the city had been deſtroyed in the three dreadful conflagrations which happened at the time of the ſiege and capture by the Latins: Conſtantinople never more regained that ſplendour which it had all along maintained. The imperial palace, which, during eleven centuries, had been the admiration of all who viſited the Eaſt, was in ruins. It ſtood between the Hippodrome and the magnificent church of St. Sophia. Its ſuperb gardens deſcended, by ſeveral rows of terraces, to the ſhore of the Propontis. The primitive edifice, erected by Conſtantine, rivalled the palace of the Cæſars on the Palatine Mount. The improvements made by his ſucceſſors ſtill added to its magnificence; and the emperors of the Comnenian dynaſty had taken particular delight in embelliſhing this imperial reſidence.

The inveterate enmity of the clergy and people of Conſtantinople againſt the Latin church ſtill ſubſiſted. To avert a cruſade, which the Latins were meditating againſt Conſtantinople, Michael Paleologus negociated with the pope, and concluded a concordat between the Greek and Latin churches; but at his death, in the year 1282, the union was diſſolved. His ſon Andronicus, who ſucceeded him, reſtored the ancient Greek ceremonies, and by this imprudent ſtep threw the empire into a new ferment.

In the mean time Conſtantine his brother ſucceſsfully oppoſed the Turks, who continued their encroachments: but his valour rendered him ſuſpected by the emperor. Conſtantine was thrown into priſon. On his removal from the army, the Turks under the famous Othoman made themſelves maſters of ſeveral places. Philantropenus and Libadarius, two officers of great merit, were ſent to oppoſe them. The former gained ſome advantages over the enemy: but elated with his ſucceſs he cauſed himſelf to be proclaimed emperor. This rebellion however was ſoon ſuppreſſed. Philantropenus was betrayed by his own men: but the Turks taking advantage of theſe inteſtine commotions extended their dominions in Aſia, conquered moſt of the iſlands in the Mediterranean, and infeſted the coaſts of the empire. Andronicus, not truſting his ſubjects, hired the Maſſagetes to aſſiſt him: but they being defeated, turned their arms againſt him. He next applied to the Catalans who behaved in the ſame manner, and, in 1292, aſſailed the empire in conjunction with the Turks. This was their firſt appearance in Europe. Their enterpriſe this time proved unſucceſsful.

New commotions having taken place in the empire, the Turks returned to the charge in 1327. The next year, however, Othoman, who may be ſtyled the founder of the Turkiſh monarchy, being dead, the emperor recovered Nice and ſome other places, which were again loſt the year following; and, in 1330, a peace was concluded, which left the Turks in poſſeſſion of their conqueſts.

This peace the Turks broke in 1357. Having reduced all Aſia, they paſſed the Helleſpont, and took a ſtrong caſtle on the European ſide. Soon after ſultan Amurath, advancing ſtill farther, made Adrianople the ſeat of his empire. He was ſlain by treachery, and ſucceeded by his ſon Bajazet, who levied a yearly tribute on the emperor of Conſtantinople, and commanded him to ſend him his ſon Manuel to attend him in his military expeditions. This demand was complied with. But the emperor dying in 1392, Manuel haſtened to Conſtantinople without taking leave of the ſultan. This incenſed Bajazet ſo highly, that he paſſed with great expedition into Thrace, ravaged the country adjoining Conſtantinople, and at laſt inveſted the city both by ſea and land. In this extremity, Manuel had recourſe to the weſtern princes, who ſent him an army of 130,000 men, under the command of Sigiſmund, king of Hungary, and John count of Nevers. After a few ſucceſſes they were defeated with great ſlaughter by Bajazet, who reſumed the ſiege of the city, and would infallibly have accompliſhed the conqueſt of Conſtantinople had he not been obliged to turn his forces againſt Tamerlane the victorious Tartar, by whom he was overcome in battle, and confined in an iron cage againſt the bars of which he beat out his brains in the year 1399.

But as this relief could not be expected to be of long duration, Manuel Paleologus ſet ſail for Venice, and from thence viſited London and Paris in the year 1400, in the reign of Henry IV. of England and Charles VI. of France, with the view of procuring ſome aſſiſtance, which the circumſtances of thoſe countries did not permit them to grant. He alſo endeavoured to negociate an union with the Latin church; but the negociation broke off. His ſon John Paleologus, who ſucceeded him, was more fortunate. He concluded a treaty at Florence with pope Eugenius IV.; but it was univerſally reprobated by the whole body of the clergy of Conſtantinople, and the emperor was obliged to renounce it. He did not long ſurvive theſe unhappy diſturbances, and, in 1448, left the empire now confined almoſt within the walls of Conſtantinople to the laſt Conſtantine.

Upon the near proſpect of being beſieged in his capital by the Tartar Turks, Conſtantine Paleloogus renewed the concordat with the Latin church. A cardinal legate from Rome was admitted at Conſtantinople; but after he had officiated in the cathedral of St. Sophia, the Greek clergy abandoned it as a polluted temple, and the whole city of Conſtantinople diſplayed every extreme of fanaticiſm and averſion againſt the Latin church. Though reduced to a narrow corner between the Propontis and the Euxine, the Byzantine empire continued the theatre of crimes and political as well as fanatical factions, until the 29th of May, 1453, when, after a ſiege of 53 days, Conſtantinople was taken by the Turks under Mahomet II. Whatever may have been the ſtrength of the army which the Turks brought againſt that celebrated metropolis, the force, which the miniſter was able to enrol by the emperor's command for its defence, was inconſiderable. There were only 4970 volunteers, and including the Italian auxiliaries, the emperor's troops did not exceed 8000 men.

Conſtantine Paleologus made a vigorous defence, and raſhly refuſed advantageous terms of capitulation. When the city was at laſt carried by aſſault, he nobly fell in the breach by which the enemy entered Conſtantinople. A ſhocking ſcene now followed. The perſons and property of the citizens were given up to the diſpoſal of the conquering army. The terrified people fled to the cathedral of St. Sophia and other aſylums, from whence they were dragged forth, and without any diſtinction of ſex or rank, chained together, driven through the ſtreets like beaſts, and more than ſixty thouſand of them ſold into ſlavery. Mahomet, at the expiration of the three days allotted for pillage, made his triumphal entry into Conſtantinople, which he named the capital of the Ottoman empire, and which has ever ſince held that ſtation. See TURKS.

Such was the dreadful cataſtrophe of Conſtantinople, once the metropolis and long the ſole exiſting remnant of the Roman empire. It fell a prey to the Turks 1043 years after Rome was taken by Alaric, and 977 years after the entire ſubverſion of the weſtern empire. Gibbon's Hiſt. of the Decline and Fall of the Roman Empire, *paſſim.* Le Beau, Hiſtoire du Bas Empire. Bigland's Letters on Ancient and Modern Hiſtory.

Conſtantinople is called by the Turks *Stampol*, *Iſtampol*, or (according to Thornton's preſent State of Turkey, p. 79.) *Iſtambol, abounding in faith.* It is ſituated at the eaſtern extremity of the province named Romania, or Romelia, on the European ſide of the Boſphorus, or ſtraits of Conſtantinople, which ſeparates Europe from Aſia; in N. lat. 41° 10'. 830 miles S. E. of Vienna and 900 E. of Rome. It riſes gradually from the ſhore in the form of an amphitheatre; but the ſtreets are narrow, and the houſes, in general, mean; the moſt ſpacious not exceeding two ſtories in height. The ſtreet called Adrianople is the longeſt and broadeſt in the city. The public buildings, ſuch as the palaces, the moſques, bagnios, bazars, and caravanſerais or khans, for the entertainment of ſtrangers, are many of them very magnificent. On one point of the triangle, on which the city is built, is the ſeraglio from whence there is a charming proſpect of the delightful coaſt of Aſia Minor. This incloſure of the Ottoman palace is ſeparated from Conſtantinople by a wall thirty feet high with battlements, embraſures, and towers, in the ſtyle of ancient fortifications. Its circumference is above ſix miles. There are in it nine gates, but only two of them remarkable for their ſize and beauty. It is from one of theſe the *Baba Hoomajun*, or *Sublime Porte*, that the Ottoman court is ſuppoſed to have taken the name of the *Porte*, or *Sublime Porte*, in all public tranſactions and records. But Mr. Thornton, in his preſent State of Turkey, page 117, contends that the palace of the grand vizir, by a metaphor familiar to moſt of the Eaſtern languages, is called the Porte or King's gate, in Perſian *Der*, being, as it were, the door of communication between the ſultan and his ſubjects, and correſponding with the European appellation of a court which follows the perſon of the ſovereign.

The ſeraglio is ſo extenſive, that it is ſuppoſed to occupy the whole of the ground on which the ancient city of Byzantium ſtood, and to contain 10,000 inhabitants. That wing of the ſeraglio which is excluſively appropriated to the ladies of the Grand Signor, is called the *Harem.* Among the ancient monuments preſerved in the ſeraglio, is the tomb of Conſtantine the Great. Of the moſques, or Turkiſh churches, the moſt celebrated is that of St. Sophia, which fronts the great gate of the ſeraglio, and is thought, in ſome reſpects, to exceed in grandeur and architecture St. Peter's at Rome. Round it are ſeveral chapels, which ſerve as burial-places for the imperial family. The other moſques of ſultan Achmet, ſultan Mahomet, ſultan Selim, ſultan Solyman, and ſultan Bajazet, are alſo very fine. Theſe imperial moſques are founded chiefly by ſultans, who have obtained victories, and devote the ſpoils of war, gained from the enemies of their religion, to the ſervice of public worſhip, the inſtruction of youth, and the relief of the poor. Foundations of this kind are annexed to every moſque. There are in Conſtantinople 518 ſeminaries of learning, and 1250 primary ſchools. The Greeks, beſides their patriarchal church, dedicated to St. George, have 22 others. The palace of their patriarch is on a hill, about two hundred paces from the harbour. The Armenians have an archbiſhop and three churches; the Roman Catholics have ſix convents, and the Jews ſeveral ſynagogues. There is alſo a Swediſh Lutheran church.

The bazars, or beſeſtins, anſwer to our markets. They are ſquares encloſed within gates, where merchants meet for traffic, having generally two rows of ſhops built under piazzas. The market of female ſlaves, *Avrat Bazar*, is a quadrangle, ſurrounded by a covered gallery, and ranges of ſmall and ſeparate apartments; but Mahometans only are admitted.

The bagnios, or public baths, are elegant and noble ſtructures, built with hewn ſtones; the inner chambers are capacious, and paved with ſlabs of the rareſt and moſt beautiful marble.

At the ſouth end of the city, is the formidable ſtate priſon of the ſeven towers, built of fine free-ſtone, and ſurrounded by a wall, with ſeveral ſmaller towers.

There are no theatres at Conſtantinople; the *Ombres Chinoiſes*, which are ſometimes exhibited in the ſtreets, ſupply the want of dramatic exhibitions. Of other public amuſements, the principal are wreſtling, and throwing the javelin, on horſeback, in the ancient Hippodrome, an oblong ſquare, called by the Turks *Almeidan.*

Conſtantinople counts 35 public libraries, ſome of which contain 15,000 volumes. That which was founded under Muſtafa III. by the vizir Racub Pacha, is the moſt modern. A renegado, of the name of Ibrahim, encouraged by the grand vizir, Ibrabim Paſha, and the Mufti Abd'ullah Effendi, introduced the firſt printing-preſs at Conſtantinople, in the year 1727. It was afterwards deſtroyed by ſome fanatics, but Abdul Hamid reſtored it. Only the Koran, and books treating of the law and the doctrines of the prophet, are forbidden to be printed. Theſe circulate in manuſcripts, and afford a comfortable ſubſiſtence to 20,000 individuals who live by copying them.

The trade of Conſtantinople is chiefly in the hands of the Jews, Armenians, and Greeks; and its commerce is carried on by foreigners of all nations, who are confounded under the general name of Franks. No reſtrictions are laid on commerce, except in the articles neceſſary for the ſupport of human life; the exportation of which is ſometimes prohibited, eſpecially from Conſtantinople, where alone the prohibition is rigorouſly enforced. Beſides ſilk, cotton, wool, flax, drugs, coffee, ſugar, wax, honey, fruits, hides, and tobacco, Conſtantinople exports its own printed muſlins, the ſatins, ſilk ſtuffs, and velvets, of Bruſa and Aleppo, the ſerges and camelots of Angora, the crapes and gauzes of Salonica, the ſword-blades of Damaſcus, and the carpets of Smyrna. The harbour is ſpacious, and ſuppoſed capable of holding 1200 ſhips. Near it is *Galata*, a ſuburb chiefly inhabited by Greeks, Armenians, Jews, and Franks, who have their warehouſes here. Beyond this is *Pera*, which may be conſidered as the ſuburb of Galata, where the foreign ambaſſadors reſide. The air is uncommonly healthy, and the proſpect delightful. Near Pera is the quarter called *Tophana*, from its canon foundery.

According to Mr. Dallaway, the population of Conſtantinople, including its ſuburbs, does not exceed 400,000 ſouls, of whom 200,000 are Turks, 100,000 Greeks, and the remainder Jews, Armenians, and Franks, or ſtrangers from all the European nations. Mr. W. Eton (in his Survey of the Turkiſh Empire, ſecond edition, page 287.) brings it down to leſs than 300,000. But this computation is evidently too low. At the time of its capture by the Latins, Conſtantinople is ſuppoſed by Villehardouin to have contained 400,000 effective men; this, however, muſt be regarded as an exaggeration. Mr. Le Beau, in his Hiſtoire du Bas Empire, ſuppoſes that it contained then about one million of inhabitants, and that its preſent population amounts to 400,000, which, by all accounts, is the moſt probable computation.

Conſtantinople is frequently viſited by the plague, which, however, excites but little alarm, and Turkiſh indifference counteracts all efforts to ſubdue this dreadful epidemical diſorder. From the year 1783 to 1785, it ſwept away 100,000 children and young people. The city has alſo often been expoſed to great conflagrations. In 1782 a fire conſumed from 7 to 8000 houſes, among which were ſome belonging to the firſt officers of the ſtate. On the 5th of Auguſt, 1784, more than 10,000 buildings were laid in aſhes, and towards the end of the ſame year, 1600 houſes and moſques were burnt down. In 1788 there was ſo extenſive a conflagration as to threaten the entire deſtruction of the city. They generally originate in the diſcontents of the Janizaries, or other military bodies. In the laſt revolution, which they effected on the 28th of May, 1807, when they forced Selim III. to abdicate the throne, and proclaimed Muſtapha IV. emperor: they contented themſelves with cutting off the heads of a few miniſters and military chiefs. But between the firſt and ſixth day of Auguſt following, three great fires reduced ſeveral hundred houſes to aſhes, and are ſuppoſed to have proceeded from the ſtrong diſſatisfaction that prevailed in the mutinous army againſt the new grand ſignor, for having iſſued an order to pay the troops only in the camp. In time of peace the Janizaries watch over and ſecure the public tranquillity, and exerciſe all the functions of police officers. A foreigner, who would be inſulted if ſeen alone in the ſtreets of Conſtantinople, may walk any where without the leaſt moleſtation if accompanied by a Janizary. See JANIZARIES. (D'Ohſſon Tableau General de l'Empire Ottoman. Eton's Survey of the Turkiſh Empire. Thornton's preſent State of Turkey.)

CONSTANTINOPLE, *Patriarch of.* See *Greek* CHURCH.

CONSTANTIUS, FLAVIUS VALERIUS, in *Biography*, ſurnamed *Chlorus* from the paleneſs of his complexion, was ſon of Eutropius, a Dardanian noble, but his education did not correſpond with the ſtyle of his birth. Under the emperors Aurelian and Probus, he had learned the military art, and by the emperor Carus, he was appointed governor of Dalmatia in the year 282. Ten years afterwards, in conjunction with Galerius, he was made Cæſar, and aſſociated with the emperors Diocletian and Maximian. To Conſtantius were aſſigned the provinces of Gaul, Britain, and Spain. At this time Carauſius, an ambitious general, had excited a revolt in Britain, and carried matters ſo far as to aſſume the imperial authority; he was alſo in poſſeſſion of the port and fleet of Boulogne. To oppoſe the uſurper, Conſtantius firſt attacked Boulogne, which ſurrendered to his arms, together with a great part of the naval ſtrength of the place. After this, Conſtantius employed three years in preparing a fleet for the conqueſt of Britain; he ſcoured the coaſt of Gaul, invaded the country of the Franks, and deprived the uſurper of the aſſiſtance of thoſe allies. Before the preparations were finiſhed, Carauſius was depoſed and murdered by his own ſervants. Allectus, his prime miniſter, ſucceeded to his power and to his danger. But he did not poſſeſs equal abilities, either to exerciſe the one or to repel the other. Conſtantius, under favour of a thick fog, eſcaped the Britiſh fleet, and landed in ſafety on the weſtern coaſt, where an engagement took place, in which Allectus was ſlain; a ſingle battle decided the fate of this great iſland, and when Conſtantius landed afterwards on the ſhores of Kent, he found them covered with obedient ſubjects. He now had occaſion only to exert his talents in eſtabliſhing a regular government; to which he appears to have been fully competent; he reigned with mildneſs, and was anxious not to oppreſs his ſubjects by heavy taxes; his court was diſtinguiſhed by ſimplicity and great frugality, and he himſelf was a decided enemy to the perſecutions which diſgraced the reigns of Diocletian and Maximian; but in which, as their ſuperior, he was obliged occaſionally to join. When, however, he roſe to the ſupreme power of Auguſtus, he baniſhed perſecution entirely from the provinces over which he governed. That event occurred in 305. Finding his health decline, he ſent, as we have ſeen, (ſee CONSTANTINE *the Great*,) for his ſon Conſtantine to join him at Boulogne, thence they failed to Britain, where the Picts had made an incurſion into the northern part of the Roman province. This expedition, and an eaſy victory over the barbarians of Caledonia, were the laſt exploits of the reign of Conſtantius. He cloſed his days in the imperial palace of York, fifteen months after he had received the title of Auguſtus, and near fifteen years after he had been promoted to the rank of Cæſar. His death was immediately ſucceeded by the elevation of Conſtantine the Great; beſides whom, he left three ſons and as many daughters, by a ſecond wife. Moreri. Gibbon.

CONSTANTIUS II., FLAVIUS JULIUS, was the ſecond ſon of the great Conſtantine, by Fauſta, and born in 317. At a very early period of his life he was declared Cæſar: when even a ſtripling, the care of the Eaſt was committed to him. On the death of his father, being then in his twentieth year, he repaired to Conſtantinople where he took a ſolemn oath that his kinſmen, who were already in diſcredit with the ſoldiery, ſhould be permitted to remain in ſafety. He is however accuſed of an utter diſregard to the ſanction of the oath, and of having excited the maſſacre in which his two uncles, and ſeven of his couſins, were put to death. In a new diviſion of the empire, in the year 338, Aſia, Syria, Egypt, and Thrace were allotted to Conſtantius. From this period he was involved in wars with various nations; of which the moſt important was that with Magnentius, in Lower Pannonia. In the firſt campaign Conſtantius was ſo far unſucceſsful, that he offered terms of accommodation, and a partition of his dominions, which his opponent haughtily refuſed, propoſing as the only ground of ſolid peace the abdication of Conſtantius. A very bloody and deciſive battle ended in a ſignal defeat of Magnentius, who with difficulty eſcaped to Italy. Conſtantius ſpent the winter in Sirmium, the place of his birth, and in the ſpring of the following year 352, he paſſed the Alps, and proceeded to the conqueſt of Italy, a taſk of no great difficulty on account of the enmity which the cruelties of Magnentius had excited againſt him and his cauſe. He now attempted to treat, but his overtures were not liſtened to: from Italy he paſſed to Gaul, and made a ſtand at Lyons. Africa, Sicily, and Spain, declared for his rival. Another victory over Magnentius, rendered Conſtantius, in 353, the ſole maſter of the Roman empire; but Magnentius, and his brother Decentius, choſe death by their own hands, rather than run the chance of falling into thoſe of their conquerors.

The conduct of Conſtantins upon this important change, has been variouſly repreſented; but there is no doubt that meaſures of the ſevereſt kind were carried on againſt thoſe who had engaged againſt him, or had rendered themſelves liable to ſuſpicion. Notwithſtanding his talents and ſucceſs as a general, he was by no means equal to the duties attaching to the high office of emperor, and he dreaded too much a rival, to place the government under the auſpices of a vigorous mind. His chief adviſers were eunuchs, with whom his court was crowded, and to whom he committed the fortunes and lives of his numerous ſubjects. Conſtantius had already declared his nephew Gallus, Cæſar, and to him was given the care of the Eaſt, where he diſplayed the moſt atrocious acts of tyranny, and exhibited an intention of aſſuming an independent ſovereignty. By the advice of Euſebius, the chamberlain of the eunuchs, Gallus was recalled, impriſoned, and executed. Thoſe who write favourably of Conſtantius, aſſert, that he had no ſooner ſigned the warrant, than he relented, and endeavoured to recal the bloody mandate; but that the ſecond meſſenger entruſted with the reprieve, was detained by the eunuchs, who dreaded the unforgiving temper of Gallus, and were likewiſe deſirous of re-uniting to their empire the wealthy provinces of the Eaſt. Some time after this event, Sylvanus, a Frank, who had been in the confidence of the emperor, and who had been of the utmoſt importance to him in his conteſts with Magnentius, was, by falſe accuſations, driven into rebellion. He aſſembled an army at Cologne, but was aſſaſſinated before it could be properly organized. The barbarian tribes of Germany, reſolving to be revenged for his death, burſt into the province, deſtroyed many cities, and among the reſt Cologne itſelf, and reduced the empire to the moſt alarming danger. Julian, the remaining nephew of the emperor, was ſent againſt them, and returned victorious. In 357, Conſtantius paid a viſit to Rome, where he was received with the higheſt honours. He diſplayed his regard for the ancient capital, by adding to its ornaments an obeliſk of granite in a ſingle piece, brought from Egypt, and ſet up in the Circus Maximus. After this, he engaged in other wars, and was in general ſucceſsful. His nephew Julian became now his rival; his high reputation in the army, induced the ſoldiers to proclaim him Auguſtus, but the emperor refuſed to acknowledge him as partner in the empire, and began to make preparations to aſſert his own rights over thoſe of his aſpiring relation. Julian had anticipated him, and had already ſeized upon Illyricum; in purſuit of him there, Conſtantius was ſeized with a fever, which at firſt threatened no ſerious conſequences, but which terminated his life, and thus delivered the country from the horrors of a civil war. He died in November 361, having reigned twenty-four years. He obtained the character of a zealous Chriſtian, and is applauded for having diſcouraged Pagan rites and ceremonies. He built many churches, and behaved with great reſpect towards the clergy; in matters of ſpeculation and theological controverſy, he conſidered himſelf an adept; was himſelf a favourer of the Arian party, and the perſecutor of Athanaſius, and of thoſe who maintained his doctrines. It muſt be confeſſed that the genuine principles of Chriſtianity were never underſtood by any of the Roman emperors; and their ſupport of it, however laudable their motives might be, was highly injurious to its progreſs in the world. Gibbon. Univer. Hiſt.

CONSTAT, in *Law*, the name of a certificate, which the clerk of the pipe, and auditors of the exchequer, make at the requeſt of any perſon, who intends to plead or move in that court for the diſcharge of any thing; and the effect of it is, the certifying what (appears) *conſtat* upon record, touching the matter in queſtion. 3 & 4 Edw. VI. cap 4. and 13 Eliz. cap. 6.

A conſtat is held to be ſuperior to an ordinary certificate; becauſe this may err or fail in its contents, that cannot, as certifying nothing but what is evident upon record. Alſo the exemplification under the great ſeal of the inrolment of any letters patent, is called a *conſtat*. Coke on Littl. 225.

CONSTELLATION, in *Aſtronomy*, an aſſemblage or ſyſtem of ſeveral ſtars, expreſſed and repreſented under the name and figure of ſome animal, or other thing: this aſſemblage is by ſome called alſo an *aſteriſm*.

The ancients portioned out the firmament into ſeveral parts, or conſtellations; reducing a certain number of ſtars under the repreſentation of certain images, in order to aid the imagination, and the memory, to conceive and retain their number, diſpoſition, and even to diſtinguiſh the virtues, which aſtrologers attributed to them: in which ſenſe a man is ſaid to be born *under a happy conſtellation*, i. e. under a happy configuration of the heavenly bodies. The diviſion of the heavens into conſtellations is very ancient, and, probably, as old as aſtronomy itſelf; at leaſt, it was known to the moſt ancient authors extant, whether ſacred or profane. In the book of Job, mention is made of the names of ſome of them; as in chap. ix. 9. "Which maketh Arcturus, Orion, and Pleiades, and the chambers of the ſouth." By the "chambers of the ſouth," ſome have underſtood the conſtellations near the ſouth pole, which are inviſible to the inhabitants of the northern hemiſphere. From the manner in which Job ſpeaks of commerce, we may infer that he lived in a country frequented by merchants, who imported thither the rarities of the ſouth. To this purpoſe Sir Iſaac Newton ſuggeſts, (Chronology, p. 157.) that Job, who lived in Arabia Petræa, among the merchants, might have derived from them his knowledge of the conſtellations. And again, mention of them occurs in that ſublime expoſtulation, chap. xxxviii. 31, 32. "Canſt thou reſtrain the ſweet influence of the Pleiades, or looſen the bands of Orion? Canſt thou bring forth Mazzaroth, (by which ſome underſtand the twelve ſigns, or zodiac,) or canſt thou guide Arcturus with his ſons?"

The firſt of the three conſtellations, mentioned by Job, is עש *aſch*, or עיש *aiſch*, by which ſome have thought that he meant the conſtellation, now called the "Great Bear." The root of *aiſch* is עוש *ouich*, which, in Hebrew, ſignifies, "to gather together, or to aſſemble;" and in Arabic, "to make a circuit, or to deſcribe a circle." Theſe two ſignifications may very well be applied to the Great Bear, which is a group of ſtars making a remarkable circuit round the pole. "Canſt thou guide (or feed) *Aiſch* with his ſons?" (chap. xxxviii. v. 32.) is an expreſſion which figuratively repreſents the ſtars that compoſe the Great Bear, collected together, like a flock which feeds in a meadow. In the ſame ſtrain Virgil ſays, (Æn. l. I. v. 611.) "Polus dum ſidera paſcet." It has been further obſerved, that *Aiſch* is the firſt ſtar named in Job; and that Αρκτος, or the Great Bear, is the firſt conſtellation mentioned by Homer, in his deſcription of the ſhield of Achilles. The ſecond conſtellation or group of ſtars mentioned by Job is כימה *kimah*. From the different paſſages in which this term occurs, we may reaſonably conclude, that it muſt be underſtood of ſome conſtellation remarkable for its relation to an agreeable ſeaſon. God ſays to Job, "Canſt thou bind the ſweet influences of *Kimah?* i. e. Canſt thou bind up or reſtrain the fertility of the earth, for producing fruits and flowers, when *Kimah* appears?" The different ſignifications of this word, both in the Hebrew and Arabic, concur in pointing out the ſame ſenſe of the term. *Kimah* may be derived from כמה *kamah*, which, in Hebrew, ſignifies, "to deſire, or to rejoice." Of all the ſeaſons the ſpring is the moſt deſirable, and the moſt productive of delight and joy. If we deduce the word *kimah* from the Arabic root *kevuam*, or *kam*, this characteriſes the ſpring as diſtinctly as the former. *Kam*, in Arabic, ſignifies, "ſubigere mulierem," and "to become warm." Accordingly, the earth, at the approach of ſpring, begins to become warm, and to open its boſom: this is alſo the time when the females of moſt kinds of animals become pregnant. It remains only to know, what was the conſtellation which in the time of Job introduced the ſpring; and this, as we have ſufficient reaſon for believing, was the Pleiades. *Kam* alſo ſignifies a "troop, number, or multitude:" and this etymology agrees perfectly well with the Pleiades, on account of the number of ſtars included in this collection, or in the conſtellation of the Bull.

The third conſtellation mentioned by Job is כסיל *keſil*; the root of which word is כסל *kaſal*, which, in Hebrew, ſignifies, "to be inconſtant or changeable:" and in Arabic, "to be benumbed, to be idle, to be cold." By *Keſil*, therefore, it is ſuppoſed that Job means the Scorpion. God ſays to Job, "Canſt thou looſen the bands of *Keſil?*" i. e. "Canſt thou looſen and open the earth, which is ſhut up and benumbed when *Keſil* appears? Canſt thou then make it produce flowers and fruits?" Adverting to the interpretation already given of *kimah*, we ſhall perceive, by the contraſted characters which diſtinguiſh them, that they are two conſtellations of the zodiac, pointing out two very oppoſite ſeaſons. If by *kimah* Job deſigned the Pleiades, it is not improbable that by *keſil* he meant the Scorpion, a conſtellation oppoſed to Pleiades by almoſt one-half of the circuit of the heavens, and which then announced the approach of winter. Accordingly, Aben-Ezra underſtood by *keſil* that ſtar of the firſt magnitude, known by the name of the Scorpion's heart, or Antares. In his commentary on Job he thus explains himſelf: "*Kimah,*" ſays he, "is the northern ſtars, and *Keſil* is a ſouthern ſtar. *Kimah* produces fruits, which are the delight of man; and *Keſil* does the contrary. *Kimah* is a great ſtar, called the Bull's eye, that is to ſay, Hyades; and *Keſil* is a great ſtar, called the Scorpion's heart, that is to ſay, Antares." Rabbi Levi Ben-Gerſon ſays alſo, in his commentary on Job, that *Keſil* is one of the ſouthern conſtellations; and that when the ſun enters into the ſign where this ſtar is found, the trees can no longer bring forth fruit, on account of the cold which this ſtar brings with it. *Keſil* has been ſuppoſed, by ſome learned commentators and critics, to denote the conſtellation Orion, which, at the time of its riſe, portends clouds and tempeſts; and they derive it from כסל *kaſal*, denoting inconſtancy. See Schultens's Commentary on Job, vol. i. p. 239, &c. vol. ii. p. 1086. Goguet's Origin of Laws, &c. vol. i. Diſſert. 3.

In the prophecy of Amos, who is ſuppoſed to have lived 790 years B. C., we have the following animated exhortation (chap. v. 7, 8.): "Ye who turn judgment into wormwood, and leave off righteouſneſs in the earth; *ſeek him* that maketh the ſeven ſtars and Orion, and turneth the ſhadow of death into the morning, and maketh the day dark with night; that calleth for the waters of the ſea, and poureth them out upon the face of the earth: the Lord is his name." In this paſſage, the ſeven ſtars and Orion are mentioned as being well known, both by Amos, who was a herdſman of Tekoa, and the common people, to whom this exhortation was addreſſed; and we may hence infer, that the conſtellations had been invented for ſome time before that period. Some of the conſtellations are alſo occaſionally mentioned by Heſiod and Homer, who flouriſhed above 900 years before Chriſt; and Aratus of Tarſus, the aſtronomical poet, who lived about 277 years B. C., in his "Phenomena," profeſſedly treats of them all, except ſome few which were invented after his time; ſhewing how each conſtellation is ſituated with regard to thoſe that are near it, what poſition it bears with reſpect to the principal circles of the ſphere, and what other conſtellations riſe or ſet with it. Hipparchus, the Bithynian, has ſhewn, that Aratus followed the deſcriptions of Eudoxus, who flouriſhed about 366 years B. C.; and it is very probable that the Greek aſtronomers who ſucceeded him continued to uſe the ſame figures of the conſtellations till the time of Ptolemy, though not without ſome variations and additions. Ptolemy's Almageſt (ſee Almagest) has been in ſuch eſteem among aſtronomers, that almoſt all who have written ſince his time have agreed in drawing the figures of the conſtellations, or ſuppoſing them to be drawn, ſo as to anſwer his deſcription, as far as poſſible; and indeed this is neceſſary, in order to avoid confuſion, when ancient and modern obſervations are compared.

The diviſion of the ancients only took in the viſible firmament, or ſo much as came under their notice: this they diſtributed into forty-eight conſtellations, thoſe being reckoned ancient conſtellations which have been received from the Greeks, and particularly from Ptolemy; twelve of theſe took up the zodiac: the names they gave them are, *Aries*, *Taurus*, *Gemini*, *Cancer*, *Leo*, *Virgo*, *Libra*, *Scorpio*, *Sagittarius*, *Capricornus*, *Aquarius*, *Piſces:* from whence the ſigns of the ecliptic and zodiac take their names; though they are now no longer contiguous to the conſtellations which denominate them; *e. g.* the conſtellation Aries, about 2000 years ago, occupied the place of the firſt ſign of the ecliptic; but, on account of the preceſſion of the equinox, it is now removed to the ſecond; and ſo of the others. See Sign.

The other ſtars, on the northern ſide of the zodiac, were diſpoſed into twenty-one conſtellations; viz. *Urſa*, *major* and *minor*, *Draco*, *Cepheus*, *Bootes*, *Corona Septentrionalis*, *Hercules*, *Lyra*, *Cygnus*, *Caſſiopeia*, *Perſeus*, *Andromeda*, *Triangulum*, *Auriga*, *Pegaſus*, *Equuleus*, *Delphinus*, *Sagitta*, *Aquila*, *Ophiuchus* or *Serpentarius*, and *Serpens:* to which have been ſince added *Antinous*, and *Coma Berenices*, and ſome others.

The ſtars on the ſouthern ſide of the zodiac were diſtributed into fifteen conſtellations: their names are, *Cetus*, *Eridanus fluvius*, *Lepus*, *Orion*, *Canis*, *major* and *minor*, *Argo*, *Hydra*, *Crater*, *Corvus*, *Centaurus*, *Lupus*, *Ara*, *Corona Meridionalis*, and *Piſcis auſtralis:* to which have been ſince added ſeveral others, viz. *Phœnix*, *Grus*, *Indus*, *Pavo*, *Apus* or *Avis Indica*, *Apis Muſca*, *Chamæleon*, *Triangulum auſtrale*, *Piſcis volans*, *Toucan*, *Hydrus*, *Xiphias* or *Dorado*, *Columba Noachi*, and *Robur Carolinum*, &c. &c. See each conſtellation under its proper head, Aries, Taurus, &c.

The other ſtars, not comprehended under theſe conſtellations, yet viſible to the naked eye, the ancients called *informes*, or *ſporades*, ſome of which the modern aſtronomers have ſince reduced into new figures, or conſtellations.

Thus, Hevelius, v. gr. between *Leo* and *Urſa major*, makes *Leo minor*; and between *Urſa minor*, and *Auriga*, over *Gemini*, makes *Lynx;* under the tail of *Urſa major*, *Canes venatici*, *Cerberus*, *Vulpecula*, and *Anſer*, *Scutum Sobieſki*, *Lacerta*, *Camelopardalus*, *Monoceros*, and *Sextans*. See alſo Antinous, Berenice, and Cor *Caroli*.

In theſe conſtellations, the ſtars are ordinarily diſtinguiſhed by that part of the image wherein they are found. Bayer diſtinguiſhes them farther by the letters of the Greek alphabet: and many of them, again, have their peculiar names, as *Arcturus*, between the knees of Bootes; *Gemina*, or *Lucida*, in the Corona ſeptentrionalis; *Palilitium*, or *Aldebaran*, in the Bull's eye, *Pleiades* in the neck, and *Hyades* in the forehead of the Bull: *Caſtor* and *Pollux* in the heads of Gemini; *Capella*, with the *Hædi*, in the ſhoulder of Auriga: *Regulus*, or *Cor Leonis; Spica Virginis* in the hand, and *Vindemiatrix* in the ſhoulder of Virgo; *Antares*, or *Cor Scorpionis; Fomahaut*, in the mouth of Piſcis-auſtralis; *Regel*, in the foot of Orion; *Sirius*, in the mouth of Canis major; *Procyon*, in the back of Canis minor; and the *Poleſtar*, the laſt in the tail of *Urſa minor*.

The knowledge of the ſtars has become more extenſive; the number of conſtellations has increaſed; and a greater number of ſtars has been introduced into each conſtellation; as their poſitions, by more accurate obſervations, have been aſcertained.

The following tables exhibit the names of the conſtellations, and the number of ſtars in each, including all to the ſixth magnitude: and alſo ſome of the moſt remarkable ſtars in each conſtellation.

TABLE I. *Conſtellations in the Zodiac.*

Names of Conſtellations.	*Number of the Stars.*				*Chief Stars.*	
	Ptolemy.	Tycho.	Hevelius.	Flamſteed, &c.		Magn
Aries, the Ram	18	21	27	66		
Taurus, the Bull	44	43	51	141	Aldebaran	1
Gemini, the Twins	25	25	38	85	Caſtor and Pollux	1. 2
Cancer, the Crab	13	15	29	83		
Leo, the Lion	with Coma Berenices 35	30	49	95	Regulus	1
Virgo, the Virgin	32	33	50	110	Spica Virginis	1
Libra, Chelæ, the Scales	17	10	20	51	Zubenich Meli	2
Scorpio, the Scorpion	24	10	20	44	Antares	1
Sagittarius, the Archer	31	14	22	69		
Capricornus, the Goat	28	28	29	51		
Aquarius, the Water-bearer	45	41	47	108	Scheat	3
Piſces, the Fiſhes	38	36	39	113		

TABLE II. *Conſtellations northward of the Zodiac.*

Names of the Conſtellations.	*Number of Stars.*				*Chief Stars.*	
	Ptolemy.	Tycho.	Hevelius.	Flamſteed, &c.		Magn.
Urſa minor, the Little Bear	8	7	12	24	Poleſtar	2
Urſa major, the Great Bear	35	29	73	87	Dubhe	1
Perſeus	29	29	46	59	Algenib	2
Auriga, the Waggoner	14	9	40	66	Capella	1
* Bootes	23	18	52	54	Arcturus	1
Draco, the Dragon	31	32	40	80	Raſtaber	3
* Cepheus	13	4	51	35	Alderamin	3
* Canes Venatici, *viz.* Aſterion, et Chara, the Greyhounds	-	-	23	25		
* Cor Caroli	-	-	-	3		
* Triangulum, the Triangle	4	4	12	16		
Triangulum minus	-	-	-	10		
* Muſca	-	-	-	6		
* Lynx	-	-	19	44		
* Leo minor, the Little Lion	-	-	-	53		
* Coma Berenices, Berenices' hair	-	14	21	43		
* Camelopardalus	-	-	32	58		
* Mons Menelaus	-	-	-	11		
Corona Borealis, the Northern Crown	8	8	8	21		
Serpens, the Serpent	13	13	22	64		
Scutum Sobieſki, Sobieſki's Shield	-	-	7	8		
Hercules cum Ramo & Cerbero, Hercules, ſince called Engonaſia	29	28	45	113	Ras Algiatha	3
* Serpentarius, ſive Ophiuchus	29	15	40	74	Ras Alhagus	3
* Taurus Poniatowſki	-	-	-	7		
Lyra, the Harp	10	11	17	22	Vega	1
* Vulpeculus & Anſer, the Fox and Gooſe	-	-	27	37		
Sagitta, the Arrow	5	5	5	18		
Aquila, the Eagle,	-	12	23	71	Altair	1
— with Antinous,	-	3	19			
Delphinus, the Dolphin	10	10	14	18		
Cygnus, the Swan	19	18	47	81	Deneb Adige	1
Caſſiopea, the Lady in her chair	13	26	37	55		
Equulus, the Horſe's head	4	4	6	10		
* Lacerta, the Lizard	-	-	-	16		
Pegaſus, the Flying Horſe	20	19	38	89	Markab	2
Andromeda	23	23	47	66	Almaac	2

TABLE III. *Conſtellations ſouthward of the Zodiac.*

Names of the Conſtellations.	*Number of the Stars.*				*Chief Stars.*	
	Ptolemy.	Tycho.	Hevelius.	Flamſteed, &c.		Magn.
* Phœnix				13		
* Officina Sculptoria				12		
Eridanus	34	10	27	84	Achernar	1
* Hydrus, the Waterſnake				10		
Cetus, the Whale	22	21	45	97	Menkar	2
* Fornax Chemica				14		
* Horologium				12		
* Reticulus Rhomboidalis				10		
* Xiphias, Dorado, the Sword-fiſh				7		
* Celapraxitellis				16		
Lepus, the Hare	12	13	16	19		
* Columba Noachi, Noah's Dove				10		
Orion	38	42	62	78	Betelgeuſe	1
Argo Navis, the Ship	45	3	4	64	Canopus	1
Canis Major, the Great Dog	29	13	21	31	Sirius	1
* Equuleus Pictorius				8		
* Monoceros, the Unicorn			19	31		
Canis Minor, the Little Dog	2	2	13	14	Procyon	1
* Chamæleon				10		
* Pyxis Nautica				4		
* Piſcis Volans, *Paſſer*, the Flying Fiſh				8		
Hydra	27	19	31	60	Cor Hydræ	1
* Sextans			11	41		
* Robur Carolinum, the Royal Oak				12		
* Machina Pneumatica				3		
Crater, the Cup	7	3	10	31	Alkes	3
Corvus, the Crow	7	4		9	Algorab	3
* Croſiers, el Cruzero				6		
* Apis Muſca, the Bee or Fly				4		
* Apus or Avis Indica, the bird of Paradiſe				11		
* Circinus, the Compaſs				4		
Centaurus, the Centaur	37			35		
Lupus, the Wolf	19			24		
* Quadra Euclidis				12		
* Triangulum Auſtrale, the Southern Triangle				5		
Ara, the Altar	7			9		
* Teleſcopium				9		
Corona Auſtralis, the Southern Crown	13			12		
* Pavo, the Peacock				14		
* Indus, the Indian				12		
* Microſcopium				10		
* Octans Hadleianus				43		
* Grus, the Crane				14		
* Toucan, the American Gooſe				9		
Piſcis Auſtralis, the Southern Fiſh	18			24	Fomelhaut	1

N. B. In the preceding Tables the new Conſtellations are diſtinguiſhed from the ancient by a ſtar, *.

TABLE IV. *Number of Stars of each Magnitude.*

	MAGNITUDES.						
	Firſt.	Second.	Third.	Fourth.	Fifth.	Sixth.	Total.
Conſtellations in the Zodiac - 12	5	16	44	120	183	646	1014
In the Northern Hemiſphere 34	6	24	95	200	291	635	1251
In the Southern Hemiſphere 45	9	36	84	190	221	323	863
	20	76	223	510	695	1604	3128

There are ſeveral ways of delineating the conſtellations and ſtars, ſo that an obſerver may be able to diſtinguiſh them in the heavens. The moſt eligible method of all is to conſtruct a hollow globe of ſuch a large ſize as to admit the obſerver to ſtand on a frame near its centre; and then to paint the ſtars and conſtellations in its inner ſurface, in their proper ſituations with regard to one another. If ſuch a globe, elevated according to the latitude, were made to turn on its poles, the obſerver near the centre would behold the motions and aſpects of the ſtars as they really are in the heavens, and ſoon obtain a correct idea of the whole. A machine of this kind, however, could not be conſtructed without a very conſiderable expence as well as ingenuity. Large machines on this plan have been made at Gottorp, at the expence of Frederick III. duke of Holſtein; and at Paris by the direction of cardinal d'Etrees; but theſe are far inferior in ſize to one erected at Pembroke college, in Cambridge, under the direction of Dr. Long. The deſcription of this curious machine is here ſubjoined in the doctor's own words. "I have, in a room lately built in Pembroke hall, erected a ſphere of 18 feet diameter, wherein 30 perſons may ſit conveniently: the entrance into it is over the ſouth pole by ſix ſteps:—the frame of the ſphere conſiſts of a number of iron meridians, not complete ſemicircles, the northern ends of which are ſcrewed to a large round plate of braſs with a hole in the centre of it; through this hole, from a beam in the ceiling, comes the north pole, a round iron rod about three inches long, and ſupports the upper parts of the ſphere to its proper elevation for the latitude of Cambridge; the lower part of the ſphere, ſo much of it as is inviſible in England, is cut off: and the lower or Southern ends of the meridians, or truncated ſemicircles, terminate on, and are ſcrewed down to a ſtrong circle of oak, of about thirteen feet diameter, which, when the ſphere is put into motion, runs upon large rollers of lignum vitæ, in the manner that the tops of ſome wind-mills are made to turn round. Upon the iron meridians is fixed a zodiac of tin, painted blue, whereon the ecliptic and heliocentric orbits of the planets are drawn, and the conſtellations and ſtars traced:—the great and little bear, and draco, are already painted in their places round the north pole; the reſt of the conſtellations are propoſed to follow: the whole is turned round with a ſmall winch, with as little labour as it takes to wind up a jack, though the weight of the iron, tin, and wooden circle, is about a thouſand pounds. When it is made uſe of, a planetarium will be placed in the middle thereof. The whole, with the floor, is well ſupported by a frame of large timbers." In 1758, the conſtellations and chief ſtars viſible at Cambridge, were painted in their proper places upon plates of iron joined together, which form one concave ſurface. We here add with regret, that this curious machine has been much neglected and is ſo far decayed as to anſwer none of the purpoſes which the ingenious contriver propoſed. The conſtellations and ſtars might alſo be drawn in two concave hemiſpheres, which would contain them all, or ſegments of ſpheres might be made of braſs or paſteboard, of ſuch dimenſions that each ſegment ſhould contain a ſingle conſtellation upon its concave ſurface. Sometimes the conſtellations are drawn upon two planiſpheres projected upon a great circle, which give us the pictures of the two concave hemiſpheres in plano. See our *Plates of Conſtellations*. The conſtellations and ſtars may be alſo depicted on a celeſtial globe.

The firſt uſe of all theſe concave ſpheres, planiſpheres, and globes is, by comparing them with the originals, to know the ſtars in the heavens; but as the rotation of the earth round its axis cauſes the heaven and ſtars, &c. apparently to move the contrary way; and thus the ſphere of the fixed ſtars is made to change its poſition, with reſpect to us, every moment of the natural day: it will be neceſſary, in order to compare the ſtars upon a concave hemiſphere, globe, or planiſphere, with the ſtars in the heaven, to place the globe, hemiſphere, &c. in ſuch a poſition as to correſpond with the ſituation of the heavens at the time of obſervation. The method of rectifying the celeſtial globe for any hour of the night, or ſo to place it that every ſtar on the globe may point at the correſponding ſtar in the heavens, will be ſhewn under the article *Celeſtial* GLOBE; and when this is done, the conſtellation may be known, by comparing the heavens and the globe with one another. *E. G.* If I would find a ſtar called Arcturus in the heavens, the globe being rectified for the hour, I find Arcturus upon it; then if I imagine a line to be drawn from the centre of the globe through that ſtar, that line continued will point at Arcturus in the heavens. Suppoſe, on the other hand, I ſee ſome bright ſtar in the heavens which I want to find upon the globe, I firſt rectify the globe for the hour of the night, and then if I imagine a line to be drawn from the ſtar to the centre of the globe, it will point at the correſponding ſtar on the ſurface of the globe. Maps of the concave ſurface of the heavens, eſpecially ſuch as take in only one conſtellation, with ſome parts of thoſe which ſurround it, are very uſeful for the purpoſe of becoming acquainted with the ſtars. Of this ſort are the figures given by Bayer in his "Uranometria," and thoſe of Flamſteed, publiſhed after his death by Hodgſon. See our *Plates of Conſtellations*. The manner of uſing theſe maps will be ſeen by the following example. If I would know the ſtars in the Great Bear, I turn the figure about, till the principal ſtars of it are in the ſame ſituation with regard to upper or under, right or left, as they appear in the heavens, at the time of making my obſervation: when this is done, it is eaſy, by looking firſt on the heavens and then upon the map, to diſcover to what parts of the figure, whether to the eye, ſnout, &c. the reſt of the ſtars are to be referred.

It is very probable that the ſtars, and more eſpecially ſome of the moſt remarkable collections of them, ſuch as Charles's Wain, the Pleiades, Orion, &c. were formed into conſtellations and had names given them, in the early ages of the world. Some of them, by their different appearances, ſerve to mark out the different ſeaſons of the year, and on that account they were not only taken notice of as a kind of directory for the commencement of ploughing, ſowing, and other operations of huſbandry (ſee Heſiod, Oper. et Dier., l. ii. v. 1 and 2.), but were alſo thought to have a great influence on the temperature of the air and the fertility of the earth. Hence, from their being *ſigns*, pointing out the times of the year when heat or cold, dryneſs or moiſture, are uſually predominant, they were alſo regarded as the cauſes of thoſe qualities in natural bodies, and imagined to have dominion over minerals, vegetables, and animals, over the complexions, and conſtitutions, and even the diſpoſitions of mankind. This opinion obtained credit the more eaſily, becauſe the ſun, moon, planets, and ſtars, were believed to be of a divine nature; inſomuch that ſome conceived they were inhabited by an inferior kind of deities, which governed their motions and directed their influences; whilſt others thought that they were animals, each of which had a living ſoul, which was guided by an intelligence, and others again ſuppoſe that they were animated by a part of the ſubſtance of the ſupreme Being. Each of theſe notions led mankind to pay them a ſort of religious worſhip. The moſt ancient idolaters are with great probability thought by ſome learned men to have received the name of Zabii from their worſhip of the hoſt of heaven; and this they could hardly do, without dividing the ſtars into parcels, as we find their apteſt ſcholars in idolatry, the Egyptians, did, who divided the heavens into ſeveral regions, which they called the ſtations or manſions of their gods. The Egyptians worſhipped the heavenly bodies; and more eſpecially the ſun and moon, which they called their great gods, denominating the ſun Oſiris, and the moon Iſis. They alſo found, or imagined that they found, in various animals, ſome properties or qualities correſponding to the motions, appearances, or influences of the ſun, moon, and ſome of the ſtars: hence they were induced not only to uſe thoſe animals in their hieroglyphic repreſentations of their deities, but alſo to pay them divine honours. Thus by the *ram, aries*, a prolific animal, they repreſented the genial fertilizing warmth of the ſun in the ſpring, as they did his violent ſcorching heat in the ſummer, by the hot and furious beaſt, the *lion*. The *bull* was regarded by them as another emblem of the various powers of the ſun in forwarding the operations of agriculture, to which this animal is ſubſervient; and hence were derived their *Apis* or *Mnevis*. The *goat* had divine honours paid him in ſome parts of Egypt, as a repreſentative of the tendency of univerſal nature to propagate the ſeveral ſpecies of beings; whence the Greeks took their image of *Pan*. *Virgo* was a repreſentation of their goddeſs Iſis: the *Scorpion* was an emblem of the deſtructive power of the malignant genius Typhon; the *triangle* was a picture of the land of Egypt, which is of this ſhape; the *balance* was the hieroglyphic of juſtice, and therefore *Libra* was thought to be a proper conſtellation for that part of the heavens wherein the ſun appears at one of the equinoxes, where he diſtributes equal day and night to the whole earth: or, in its relation to the land of Egypt, it may intimate the equal diſtribution of the Nile to the ſeveral parts of the country, by the genius of the waters; for the figure of this conſtellation was among the Egyptians a man holding a pair of ſcales. The Egyptians worſhipped *ſerpents* and *fiſhes*: and the *altar* is ſaid to have been an hieroglyphic of the land of Egypt. Many other ſimilar inſtances might be adduced, as moſt of the animals and other figures that occur among our preſent conſtellations were originally Egyptian. The Greeks, who learned aſtronomy of the Egyptians, retained ſeveral of their figures, as the ram, the bull, the lion, the dog, the triangle, &c.; but accommodated almoſt all of them to the fabulous hiſtory of their gods and heroes, whom they thus placed among the ſtars. Accordingly the Greek and alſo the Roman poets, from the ancient theology, have given us wild and romantic fables about the origin of the conſtellations, probably derived from the hieroglyphics of the Egyptians, and tranſmitted, with ſome alterations, from them to the Greeks; which may be ſeen in Hyginus's Poeticon Aſtron. and Ricciolus's Almageſt, lib. vi. cap. 3, 4, 5; and Sherburne's notes upon Manilius.

Sir Iſaac Newton obſerves, (ſee his Chronology, apud Oper. vol. v. p. 64.) that Muſæus, one of the Argonauts, was the firſt among the Greeks who made a ſphere; and the ſphere itſelf, he ſays, ſhews that it was delineated in the time of the Argonautic expedition; for that expedition is delineated in the Aſteriſms. Thus we have the golden *Ram*, the enſign of the veſſel in which Phryxus fled to Colchis; the *Bull* with brazen hoofs tamed by Jaſon; and the twins, *Caſtor* and *Pollux*, two of the Argonauts, with the *Swan* of Leda their mother. We have alſo the ſhip *Argo*, and *Hydrus* the watchful dragon: with Medea's *cup*, and a *Raven* upon its carcaſe, the ſymbol of death. We have *Chiron* the maſter of Jaſon, with his *altar* and *ſacrifice*; the Argonaut *Hercules* with his *dart* and *vulture* falling down, and the *Dragon*, *Crab*, and *Lion*, which he ſlew; and the *Harp* of the Argonaut Orpheus. All theſe, ſays ſir Iſaac, relate to the Argonauts. We have alſo *Orion*, the ſon of Neptune, or, as ſome ſay, the grandſon of Minos, with his *Dogs*, and *Hare*, and *River*, and *Scorpion*. We have the ſtory of Perſeus in the conſtellations of *Perſeus*, *Andromeda*, *Cepheus*, *Caſſiopea*, and *Cetus*; that of Calliſto, and her ſon Arcas, in *Urſa major* and *Arctophylax*; that of Icareus and his daughter Erigone in *Bootes*, *Plauſtrum*, and *Virgo*. *Urſa minor* relates to one of the nurſes of Jupiter; *Auriga* to Erechthonius; *Ophiuchus* to Phorbas; *Sagittarius* to Crolus the ſon of the nurſe of the Muſes; *Capricorn* to Pan; and *Aquarius* to Ganimede. We have Ariadne's *Crown*, Bellerophon's *Horſe*, Neptune's *Dolphin*, Ganimede's *Eagle*, Jupiter's *Goat*, with her *Kids*; Bacchus's *Aſſes*, the *Fiſhes* of Venus and Cupid, and their parent the *South-fiſh*. Theſe with *Deltoton* are the old conſtellations mentioned by Aratus; and they all relate, ſays Newton, to the Argonauts and their contemporaries, and to perſons one or two generations older; and nothing later than that expedition was delineated there originally. Antinous and Coma Berenices are novel. Although it be true, as ſir Iſaac Newton affirms, that none of the figures on this ſphere bear relation to any tranſaction of later date than the Argonautic expedition; yet the great diſagreement that ſubſiſts among mythologiſts in their accounts of theſe figures ſhews them to be of greater antiquity, and that the conſtellations were received for ſome time among the Greeks, before their poets, according to their ſeveral fancies, applied them to different fables. See Long's Aſtronomy, vol. i. p. 162.

As the ſtars grouped in our conſtellations are capable of being reduced to very different figures, thoſe of the Chineſe and Japaneſe are very different from ours; and ſome ſuperſtitious Arabians, though they received their aſtronomy from the Greeks, have given ſome of their conſtellations different figures; becauſe they thought it unlawful to draw any human figure; and therefore they changed all ſuch on the celeſtial globe into ſome other form. Some Chriſtian aſtronomers, diſpleaſed to ſee the heavens of the fixed ſtars occupied by the fabulous heathen deities and heroes have propoſed, from ſuperſtitious zeal but without a due regard to the ſcience of aſtronomy, to introduce a reformation in this reſpect; and whilſt they retained the ancient figures, to refer them to ſome ſcripture hiſtory. With this view they would have *Aries,* or the ram, to be a memorial of that which was offered inſtead of Iſaac, *Virgo* to repreſent the bleſſed Virgin, &c. Thus, venerable Bede, inſtead of the profane names and figures of the twelve conſtellations of the zodiac, ſubſtituted thoſe of the twelve apoſtles; whoſe example being followed by Julius Schillerius, in 1627, he completed the reformation, and gave ſcripture names to all the conſtellations in the heavens. Thus, *Aries,* or the ram, became converted into St. Peter; *Taurus,* or the Bull, into St. Andrew; *Andromeda* into the ſepulchre of Chriſt; *Lyra* into the manger of Chriſt; *Hercules* into the Magi coming from the Eaſt; *Canis major* into David, &c. Weigelius, profeſſor of mathematics in the univerſity of Jena, made a new order of conſtellations; converting the firmament into a *cœlum heraldicum;* and introducing the arms of all the princes in Europe, by way of conſtellations. Thus, *Urſa major,* he transformed into the elephant of the kingdom of Denmark; the *Swan* into the Ruta with ſwords of the houſe of Saxony; *Ophiuchus* into the croſs of Cologne; the *Triangle* into the compaſſes, which he calls the *ſymbol of artificers;* and the *Pleiades* into the *Abacus Pythagoricus,* which he calls that of merchants, &c. However, the more intelligent among aſtronomers never approved of innovation; as ſerving no purpoſe but to introduce confuſion into aſtronomy. The old conſtellations, therefore, are ſtill retained; both becauſe better could not be ſubſtituted, and likewiſe to keep up the greater correſpondence and uniformity between the old aſtronomy and the new. See Catalogue.

CONSTERNATION is defined by ethical writers to be an exceſs of horror, owing to the ill government of our *admiration* and *fear:* or ſuch an immoderate degree of *fear* as confounds the faculties, and incapacitates a perſon for conſultation and execution. It denotes a ſtrong foreboding of tremendous evils, that are likely to follow misfortunes which have already taken place.

CONSTIPATION, in *Medicine,* is ſynonymous with *coſtiveneſs,* and ſignifies a retention of the ſtools beyond the uſual period; which likewiſe implies, in general, a dry and hardened condition of the excrements, and ſome difficulty in diſcharging them.

The proximate cauſe of conſtipation of the bowels may conſiſt in an unuſual ſlowneſs of the periſtaltic motion, or in an obſtruction to the paſſage of the fæces, while the proper periſtaltic motion continues to propel them. The natural motion of the bowels is conſiderably different in individuals of different conſtitutions, and even in the ſame individuals at different periods: ſo that it is not eaſy to ſay when the periſtaltic motion can be conſidered as preternaturally ſlow, while the general health continues good. But it is probable that a ſtool ſhould occur once in 24 hours, in moſt habits, although there are many perſons who retain the fæces much longer without inconvenience. Dr. Cullen affirms, that he is clearly of opinion, that every deviation from a diurnal ſtool is an approach to an unnatural ſtate. The accumulation and induration of the fæces in the great inteſtines not only often produces many diſeaſes in the lower part of the canal, but even occaſions diſorders in diſtant organs, and deranges the ſyſtem in general.

The occaſional cauſes of an inefficient periſtaltic motion are various. A weakneſs of the muſcular coat of the bowels appears to be, in ſome caſes, the origin of coſtiveneſs, which is then accompanied with other marks of debility; hence coſtiveneſs is not unfrequent in the female ſex, who ſuffer conſiderable inconveniences from it. A cauſe of a contrary nature ſeems likewiſe to give riſe to conſtipation, namely, a rigour and rigidity of the alimentary canal. In ſuch caſes there is neceſſarily a degree of immobility or torpor, ſo that the ſtimulus of the paſſing fæces excites the inteſtines to leſs active motions, than in the more irritable habits; at the ſame time digeſtion is more perfectly performed, and a ſmaller proportion of fæces therefore is produced: the abſorption of the liquid parts too is more complete, and hence the fæces are not only ſmaller, but drier, and paſs leſs eaſily. In rigid and robuſt perſons therefore habitual conſtipation is not uncommon. And in thoſe of hypochondriacal or melancholic habits, a ſimilar torpor in the motions of the whole ſyſtem, and particularly of the inteſtinal canal, produces a ſimilar diſpoſition to coſtiveneſs. Another cauſe of the ſlowneſs of the periſtaltic motion may be a deficiency of *bile* in the inteſtines, which is conſidered as one of the principal ſtimuli in maintaining the motion of the canal downwards. It is not indeed always in our power to aſcertain the occurrence of this circumſtance; but we know that, where the bile is withheld from the inteſtines, as in jaundice, there is commonly conſtipation. It is not quite evident in what manner a regular and conſtant exerciſe of geſtation, as in a carriage or on the water, produces coſtiveneſs, rather than any conſiderable bodily activity, which is accompanied by much perſpiration; Dr. Cullen is diſpoſed to attribute it to the abſtraction of the other inteſtinal fluids, ſecreted from the mucous glands and exhalent arteries. See Materia Med. vol. ii. p. 496.

The cauſes which may obſtruct the paſſage of the fæcal matter, occur either in the inteſtines themſelves, or in the neighbouring parts. In the inteſtines, a mechanical impediment is ſometimes occaſioned by a thickening of the coats, which ſtraitens the paſſage, or by ſchirrous tumours, eſpecially near the lower extremity of the canal. Sometimes the cavity of the inteſtine is partly filled by calculous concretions. A temporary diminution of the calibre of the canal is alſo occaſioned by ſpaſmodic contractions in the coats, as occurs in colic, or by the occurrence of inflammation, as in *enteritis,* and *dyſentery;* in all of which the fæcal matter is retained. Tumours in the neighbouring parts, compreſſing the inteſtines, neceſſarily impede the paſſage of the contained fæces. Hence obſtinate conſtipation has ſometimes been occaſioned by a ſteatomatous tumour in the omentum; and a very frequent cauſe of coſtiveneſs is the compreſſion of the diſtended uterus upon the rectum, or lower gut, in pregnant women.

When, from neglect of evacuation, or other circumſtances, an accumulation of fæces to a conſiderable extent takes place in the rectum, or lower inteſtines, this collection of matter itſelf becomes a cauſe of a moſt painful and diſtreſſing conſtipation, attended with peculiar ſymptoms, and ſometimes terminating fatally. This diſorder was firſt deſcribed by an anonymous writer in the Medical Obſervations and Inquiries, vol. iv. p. 123, and other caſes have ſince been recorded by other practioners. (See Duncan's Medical Commentaries, vol. x. p. 255, and vol. xiii. p. 282.) It is the more important to attend to this complaint, becauſe it aſſumes the appearance of a *diarrhœa,* or rather a chronic dyſentery, and has been often miſtaken for the former, and erroneouſly treated with aſtringents and opiates in conſequence. The patient complains of ſevere pain about the lower region of the belly, remitting and again returning after frequent, but ſhort intervals, and accompanied with a perpetual bearing down, and almoſt continual inclination to evacuate the contents of the inteſtines; but only a trifling quantity of thin diſcharge is expelled, ſometimes mixed with ſmall knobs of hardened excrement, or ſcybala; after which the pain abates. A freſh ſpaſmodic effort ſucceeds, and with ſimilar ſucceſs. It may be conſidered as a kind of ſpontaneous ſpaſm of all the parts in, or connected with, the pelvis, for the excluſion of this irritating ſubſtance. When, from a previous coſtiveneſs, from the acuteneſs of the pain and *teneſmus* (or bearing down), and the obſtruction of formed and feculent ſtools, this ſtate of the rectum is to be ſuſpected, the gut ſhould be examined *per anum*, when the fæces will be readily detected in general, and muſt be broken down and removed by the finger, or ſome other mechanical means. The accumulation, which thus takes place, is ſometimes very great. The following account from an apothecary, is given by Dr. Warren of Taunton:—"the evening you left us, I extracted from our patient (a lady, aged 64, who had laboured under this diſeaſe for five months,) four large balls of hardened excrementitious matter, about the ſize of hen's eggs; the next morning ſhe diſcharged near twenty, and has continued to paſs more or leſs of them every day, until about a week ago, when ſhe took a larger doſe than ordinary of caſtor oil, which evacuated 18 lumps of the ſame ſize as formerly; ſince that her ſtools have been natural, none of the balls having appeared." See Duncan's Med. Com. vol. x. p. 259. This diſorder is peculiar to perſons in advanced life, when a degree of atony often exiſts in the bowels; and it is more frequently obſerved in the female, than in the male ſex. Whatever tends to leſſen the periſtaltic motion of the bowels, muſt induce a prediſpoſition to it; and it is ſaid to have been frequently occaſioned by a long continued uſe of bark, opium, and other aſtringent medicines.

The conſequences of a conſtipated ſtate of the bowels, however, though in a comparatively trivial degree, whether idiopathic, or as a concomitant of other diſeaſes, are frequently extremely injurious to the conſtitution; producing, when it is idiopathic, a variety of diſorders; and aggravating, when ſymptomatic, the diſeaſes of which it is a ſymptom.

The ſtomach and inteſtines, being a continuation of the ſame canal, reciprocally affect each other, when diſordered. Hence, complaints of the ſtomach are frequent conſequences of coſtiveneſs of the bowels; ſuch as flatulence, ſtomach colic, or gaſtrodynia, heart-burn, indigeſtion, &c. Another affection of the canal is frequently produced by conſtipation, namely, the appearance of hæmorrhoidal tumours, or piles, at the lower extremity of the rectum, about the anus. See HÆMORRHOIS. Sometimes from a ſympathy of the head with the ſtomach, and ſometimes probably from the preſſure of the loaded inteſtines on the great veſſels, impeding the circulation of the blood downwards, and therefore determining it more copiouſly towards the head, a pain of the head is excited by a conſtipated condition of the bowels. This head-ache is various in different inſtances, but moſt commonly is confined to the forehead, or to the *occiput*, or nape of the neck: occaſionally the hemicrania, or intermitting head-ache, appears to ariſe from conſtipation. In thoſe whoſe habits prediſpoſe them to apoplectic, paralytic, or lethargic attacks, a loaded ſtate of the bowels, by obſtructing the circulation downwards, increaſes the prediſpoſition, and occaſionally even becomes the exciting cauſe of thoſe diſeaſes.

There are, beſides, many diſorders both acute and chronic, which, although they cannot be ſaid to be produced by conſtipation of the bowels, are nevertheleſs greatly aggravated by it; and the conſtipation is frequently a leading ſymptom of theſe diſorders. Thus in all acute febrile complaints, and particularly in idiopathic and eruptive fevers, ſuch as the ſynochus, or ſummer-fever, typhus, ſcarlet-fever, ſmall-pox, &c. conſtipation is liable to occur, and when occurring at any period of the fever, tends to aggravate its ſymptoms, and to prolong its duration: and if, on the contrary, the bowels are freely opened in the commencement of theſe diſorders, their ſeverity is mitigated, and their duration frequently abridged. This is more eſpecially the caſe in ſynochus and typhus, and in the febrile complaints of children. In a certain ſet of chronic diſeaſes, which have heretofore been conſidered as unconnected with the condition of the bowels, ſuch as many hyſterical affections, chloroſis, and particularly chorea, or St. Vitus's dance, conſtipation has lately been ſhewn to be a ſource of much miſchief, if not frequently the exciting cauſe. (Hamilton on Purgatives.) See CHOREA, and CATHARTICS. In ſhort, a conſtipated ſtate of the bowels is at all times liable to produce injurious effects on the conſtitution: in health it is a common exciting cauſe of various complaints; and in all ſtates of diſeaſes, whether acute or chronic, it tends to aggravate the ſymptoms, and to prevent the beneficial operation of remedies.

The mode of obviating conſtipation muſt be varied, according to the nature of the cauſe, and the conſtitution of the patient. Where it is ſlight and accidental, any of the milder cathartics, ſuch as magneſia vitriolata, or Epſom ſalt, caſtor oil, (oleum ricini,) rhubarb, or ſmall doſes of calomel, will generally anſwer the purpoſe of removing it: if theſe fail, the more active purgatives muſt be reſorted to, eſpecially in ſtrong habits, ſuch as jalap, aloes, extract of colocynth, calomel in larger doſes, and combined with ſome of the preceding ſubſtances. Calomel, or the other mild mercurial preparations, appear to be peculiarly uſeful, when the conſtipation is occaſioned by a torpor of the hepatic ſyſtem, and a conſequent deficiency, or morbid change in the quality of the bile, as they appear to ſtimulate more particularly the biliary ducts and veſſels. The colour and fætor of the ſtools ſhould be noticed with care, ſince the quality and condition of the bile, which is the principal colouring matter of the fæces, may be thus moſt eaſily aſcertained. In acute diſeaſes this obſervation is more peculiarly important, as the ſenſible qualities of the fæces frequently indicate a loaded and morbid condition of the alimentary canal, and the neceſſity of laxatives, when the number of motions does not appear to require ſuch evacuation. See Hamilton; alſo Abernethy, Surgical Obſervations, vol. ii.

When conſtipation is habitual, ſome gently ſtimulating or cooling laxative, according to circumſtances, may be required to be given daily, until the habit be removed. Much may be done for the relief of this by diet; as by eating a large proportion of vegetables, or by the free uſe of fruits, even thoſe which are dried, or preſerved with ſugar; and by avoiding ſuch articles as manifeſtly tend to conſtringe the body. And the advice of Mr. Locke ſhould be ſteadily followed; *i. e.* the patient ſhould go regularly to ſtool at the ſame hour daily: for ſuch is the periodical regularity of all the functions of the body, that they are more perfectly performed at the accuſtomed hours than at any other period. Thus ſleep, and the appetite for food, often forſake us altogether, if we delay the gratification beyond the uſual hour.

In ſtates of extreme conſtipation it is very common among the vulgar to reſort to a medicine which appears to have been firſt employed from the moſt abſurd and falſe notions of its powers, namely, crude mercury, or quickſilver. Whether it may have been ſuppoſed to open the bowels by ſome ſelf-moving power, or by its mechanical weight, the theory is equally abſurd: and what is worſe, the practice is not only uſeleſs, but dangerous. There are caſes on record, in which the quickſilver, thus adminiſtered, had accumulated in the inteſtines, formed itſelf a ſac by its weight, and at length produced death, by paſſing into the cavity of the abdomen, in conſequence of the rupture of this ſac. It is obvious, indeed, that the medicine could not ever force a paſſage by its weight, along the courſe of the bowels, ſince it muſt aſcend occaſionally, if the body is erect; and the whole paſſage muſt be nearly horizontal, if the patient be in a recumbent poſture.

In the worſt degrees of conſtipation, glyſters conſiſting of an infuſion of tobacco, or the ſmoke of tobacco, have been thrown into the bowels with advantage. And when all other expedients have failed, the affuſion of cold water on the lower extremities while the patient is placed with his feet on a cold hearth, has been found to excite the propulſion of the fæces. See Colic. A glyſter conſiſting of Venice turpentine, ſuſpended in water by means of mucilage, or the yolk of an egg, was a favourite remedy with Dr. Cullen for ſevere conſtipation; and it is undoubtedly an efficacious expedient; more eſpecially if adminiſtered a few hours after an active cathartic has been taken internally.

Where the conſtipation is occaſioned by a mechanical obſtruction, it can of courſe be alleviated only by the removal of the obſtruction. If it ariſes from the preſence of tumours or concretions external to the bowels, it may be conſidered as incurable; and can only be alleviated by keeping the bowels lax, and the fæces in as liquid a ſtate as poſſible. Strictures of the lower inteſtine have been frequently relieved by the introduction of a bougie, mechanically enlarging the paſſage. An intelligent writer remarks, that "ſtrictures take place in different ſituations; but they occur ſo frequently about the ſigmoid flexure of the colon, near its termination in the rectum, that this part ſhould be carefully examined in every caſe of a total obſtruction of the bowels." The inſertion of an unyielding tallow candle, though often practiſed, has been generally found painful and inefficacious. It is requiſite for the purpoſe to employ a bougie thirteen inches long, and of a proportionate ſtrength; which ſhould alſo be directed, with a nice hand, by a ſkilful ſurgeon. "I lately ſaw a lady," he adds, "thus relieved, who had been twenty-ſix days without any evacuation from the bowels, and who ſeemed nearly exhauſted by violence of pain, and diſtenſion of the abdomen, hiccough, cold ſweat, &c. It is remarkable how long patients ſubſiſt under theſe diſtreſſing circumſtances. In one inſtance the time was twenty-nine days; in another patient thirty-three days. As the latter recovered after enduring every torture ſuch a diſorder could inflict, practitioners may be encouraged to perſevere ſteadily in their attentions, and to retain ſome hopes even in the greateſt extremity." Willan on Diſeaſes in London, page 185.

CONSTITUENT Parts, in *Chemiſtry*. The conſtituent parts of bodies are their diſſimilar parts, or principles, into which they may be reſolved, by the rules of that art. They are thus called in diſtinction from the integrant parts of bodies, which are parts of the ſame nature and properties with the bodies themſelves. Thus quickſilver, diſſolved by aqua fortis, may be ſeparated from the diluted menſtruum, by means of a copper plate, in its own form; this therefore was only divided into its integrant parts; but cinnabar reſolved by chemiſtry into ſulphur and mercury, is divided into its conſtituent parts, neither of theſe, nor any particle of them, being cinnabar, or having its properties. Shaw's Lectures, p. 15.

CONSTITUTION, an eſtabliſhment, ordinance, deciſion, regulation, or law, made by authority of a prince, or other ſuperior, eccleſiaſtical or civil.

The conſtitutions of the Roman emperors make a part of the civil law. The conſtitutions of the church make a part of the canon law. Some of the papal conſtitutions are in form of *bulls*, others of *briefs*. See each article.

Constitutions *of Clarendon*. See Clarendon.

Constitutions, *Clementine*. See Canon *Law*.

Constitutions, *Legatine*, were eccleſiaſtical laws enacted in national ſynods, held under the cardinals Otho and Othobon, legates from pope Gregory IX. and pope Clement IV., in the reign of Henry III., about the years 1237 and 1268.

Cardinal Otho arrived in England, as a legate from the pope, in the year 1237, where he continued about three years, receiving many valuable preſents from the biſhops, monaſteries, and clergy. This legate held a council at London, A. D. 1237, in which a great number of canons were framed, which were called "the Conſtitutions of Otho." Theſe conſtitutions do not contain many things new or remarkable. By the ſecond canon, the ſacraments are declared to be ſeven in number; the fifteenth is againſt the clandeſtine marriages of the clergy; and the ſixteenth againſt their keeping concubines publicly: both which practices were ſtill very frequent in England. This legate convened two other aſſemblies of the clergy, with no other view but to make exorbitant demands of money. After the reſtoration of the royal authority, by the victory of Eveſham, the pope ſent his legate Othobon into England, who held a national council, A. D. 1268, at St. Paul's in London. In this council many canons were made, much the ſame in ſubſtance with thoſe of the former council of London, in 1237, under the legate Otho.

Constitutions, *Provincial*, are principally the decrees of provincial ſynods, held under ſeveral archbiſhops of Canterbury, from Stephen Langton, in the reign of Henry III. to Henry Chicheley, in the reign of Henry V., and adopted alſo by the province of York in 1463, under Henry VI.

Constitutions *of* 1603. See Canon *Law*.

Constitutions, *Apoſtolical*, in *Eccleſiaſtical Hiſtory*, denote a collection of regulations attributed to the apoſtles, and ſuppoſed to have been collected by St. Clement, whoſe name they likewiſe bear.

Theſe are divided into eight books; conſiſting of a great number of rules and precepts, relating to the duties of Chriſtians, and particularly to the ceremonies and diſcipline of the church.

Mr. Robert Turner, in his "Diſcourſe of the pretended Apoſtolical Conſtitutions," maintains, that theſe eight books ſeem to have been made out of ſeveral doctrines, conſtitutions, canons, travels, and traditions, aſcribed to the apoſtles, and out of ſome of the ancient liturgies, and the diſcipline and practice of the Greek church, only blended together, adulterated, and changed, by ſome ignorant Arian, in the fifth century. Biſhop Pearſon was of opinion, that the Apoſtolical Conſtitutions were formed out of ſeveral leſſer works, called Doctrines and Conſtitutions, ſaid to be written by Clement, Ignatius, Hippolytus, and others, but altered and interpolated by the author of this collection; and that the eight books of the Conſtitutions, as we now have them, were not compoſed and finiſhed till after the time of Epiphanius.

Authors, however, are divided about the genuineneſs of theſe Conſtitutions: the generality hold them ſpurious, and endeavour to prove them poſterior to the apoſtolic age; maintaining they were unknown till the fourth century:

which, if this be the fact, ſhews, that St. Clement had no concern in them. It is certain, that no ſuch book is quoted as Scripture by any Chriſtian writer of the three firſt centuries. The firſt who cites a work under this title is Epiphanius, and yet he ſpeaks of it as of doubtful authority; and ſome modern writers are of opinion, that the Conſtitutions quoted by Epiphanius were different from the preſent Conſtitutions. When he ſays, that it was "doubted by many," he himſelf intimates, that ſome ſuſpected it to be the work of ſome heretic; in oppoſition to which he ſays, it ought not to be rejected, as, from its contents, it appeared to be the work of ſome honeſt, orthodox, or Catholic Chriſtian.

It is not eaſy to ſay, what reſpect Epiphanius himſelf had for this work. He quotes things from it as ordinances of the apoſtles, and as the divine word or doctrine; but it is not mentioned in any of the paſſages, where he gives the catalogues of the books of Scripture. Beſides, his expreſſions juſt taken notice of ſeem to imply no more, than that the book was an eccleſiaſtical or orthodox writing; and we may obſerve farther, either that his Conſtitutions were not the ſame as ours, or that he had no great regard for them. For in our Conſtitutions, ſeveral early heretics are named, and they are condemned and confuted; of which paſſages, nevertheleſs, Epiphanius has made no uſe in his hiſtory of thoſe heretics, or in his arguments againſt them: which every one muſt think he would have done, if the Conſtitutions which we have had been then in being, and had been eſteemed by him as of authority. Whatever might be his opinion concerning this work, we have no good reaſon for ſuppoſing that it was a book of ſacred Scripture; becauſe no ſuch book is quoted as Scripture by Irenæus, Clement of Alexandria, Origen, Cyprian, Euſebius, or any other Chriſtian writer of the firſt three centuries. It is more than probable that the eight books, as we have them, were not compoſed and finiſhed till after the time of Epiphanius, towards the middle, or before the end, of the fifth century. Cotelerius (Ap. Patr. Apoſt. t. i.) ſays, it is certain, that the work of the Apoſtolical Conſtitutions, in eight books, is apocryphal and pſeudepigraphal, not compoſed by the apoſtles, nor by the apoſtolic Clement. Tillemont concurs in opinion with Cotelerius. Daillé thinks, that the Conſtitutions were compoſed after the council of Nice, and before the end of the fifth century; and biſhop Pearſon ſuppoſes, that the eight books of the Conſtitutions, as we now have them, were not compoſed and finiſhed till after the time of Epiphanius. Le Clerc mentions ſome things in the Conſtitutions exceedingly unſuitable to the character of the apoſtles of Chriſt, and ſays, that they well repreſent the eccleſiaſtical diſcipline of the fourth century, but not of earlier times. He thinks, they were compoſed by ſome Arian of the fourth century; and ſeems to imagine, there may be ſome probability in the conjecture of another learned man, *viz.* Thomas Bruno or Brown, that they are the work of Leontius, biſhop of Tripoli in Lydia.

Mr. Whiſton has ventured to oppoſe the general opinion: and with ſome reaſon, much learning, and more warmth, aſſerted the Apoſtolical Conſtitutions to be one of the ſacred writings, dictated by the apoſtles in their meetings, written down from their mouths by St. Clement, and intended as a ſupplement to the New Teſtament; or, rather, as a ſcheme and ſyſtem of Chriſtian faith and polity. See his Eſſay on the "Apoſtolical Conſtitutions," and his hiſtorical preface; wherein the ſeveral ſteps he made in his fancied diſcovery are traced.

Dr. Lardner, after citing ſeveral opinions of learned men concerning this work, offers his own ſentiments in his uſual judicious and impartial manner. In his inveſtigation of its contents and authority, he obſerves, that the whole of the work, and all the ordinances in it, from beginning to end, are delivered in the name of all Chriſt's apoſtles, and as from God himſelf; and moreover, that they aſſume not only the names of the apoſtles, but alſo their characters and actions. Hence, according to the whole tenor of the work, they are rightly termed "Apoſtolical." Dr. Lardner next proceeds to inquire, both from external teſtimony and internal evidence, how far the authority claimed by theſe conſtitutions, and by the advocates of their antiquity, is well founded. To this purpoſe he obſerves, that Daillé, after having examined all the ſeveral eccleſiaſtical writers of the firſt three centuries, Barnabas, Clement of Rome, Juſtin Martyr, Athenagoras, Irenæus, Clement of Alexandria, Tertullian, Origen, Cyprian, Dionyſius, Peter of Alexandria, and ſome others, has ſhewn, with great probability, that the conſtitutions were unknown to all theſe writers. In this opinion Mr. Turner, already cited, concurs. Moreover, the conſtitutions contain a long hiſtory of Simon Magus, and an account of divers other heretics, ſuch as Cleobius, Doſitheus, the Ebionites, Cerinthus, Marc, Menander, Baſilides, Saturninus, the Nicolaitans, and Hemerobaptiſts. The evil of hereſies is ſhewn; the cauſes of them are aſcertained and enumerated; they are condemned and confuted. Nevertheleſs, no notice is taken of all this by Irenæus, Tertullian, Clement of Alexandria, or Euſebius; nor even by Epiphanius; though it would have been much more to their purpoſe. In ſhort, ſays Dr. Lardner, they could not have omitted it in their cenſures of the ancient hereſies, or in their arguments againſt them, if they had been acquainted with it; for, certainly, the expreſs authority of the apoſtles would have been of great advantage to them. As to Clement of Alexandria, though he quotes Clement of Rome, Barnabas, and other Chriſtian authors, and had many occaſions for quoting the conſtitutions, if he had been acquainted with them, yet he does not take the leaſt notice of them. Beſides, the conſtitutions abſolutely forbid the reading of heathen authors; nevertheleſs, the fore-mentioned Clement, who was himſelf a man of extenſive reading, and a great maſter of heathen learning, frequently cites in his works all ſorts of authors, and has recommended the reading of heathen authors, and the ſtudy of philoſophy; which he would not have done, if he had been acquainted with theſe conſtitutions, and had acknowledged them to be apoſtolical. Tertullian, Origen, and many more juſtify and recommend the reading of heathen compoſitions, which could not have been the caſe, if in doing this they would have violated an apoſtolical conſtitution. If, indeed, there had been a conſtitution of the Chriſtian church, which forbade the reading of ſuch books, the emperor Julian would have had no occaſion to make the ſame prohibition. In the third century a diſpute occurred about baptiſm; in which Cyprian and the African biſhops maintained againſt Stephen biſhop of Rome, that the baptiſm of heretics was null and void, and therefore that thoſe who came over from them were to be re-baptized; this controverſy is decided in the conſtitutions agreeably to the judgment of Cyprian and his colleagues; and yet it was not appealed to at that time, becauſe, probably, it was not then extant. Dionyſius, who was biſhop of Alexandria about the year 248, appears to have been altogether unacquainted with our apoſtolical conſtitutions. When a controverſy occurred about the time of keeping Eaſter, which commenced in the ſecond century, and laſted till the ſitting of the council of Nice, no appeal was made to the conſtitutions, which would have ſerved to decide the diſpute, if they had actually exiſted or had been received as apoſtolical. If an appeal be made to the writers of the fourth and the former part of the fifth century, ſuch as Gregory Nazianzen, Baſil, Chryſoſtom,

tom, the Cyrils of Jeruſalem and Alexandria, Jerom, Auguſtine, &c.; they give us no intelligence concerning the apoſtolical conſtitutions; having neither cited nor mentioned them in any of their writings. The firſt (Epiphanius excepted) who has mentioned them, as divided into ſeveral books, is the author of the imperfect work upon St. Matthew, probably a Latin writer, and plainly an Arian, who wrote ſome time after the reign of Theodoſius the Great; probably not till after the end of the fifth century. Upon the whole, the conſtitutions are deſtitute of all external evidence, that ſhould entitle them to the character of apoſtolical. As to the internal evidence, they evidently bear many marks of a later age than that of the apoſtles, and unſuitable to their character. Their manner of quoting the books of the New Teſtament does not ſuit the apoſtles, of which Dr. Lardner has given ſeveral inſtances; many things occur in theſe books, that refer to a later period than that of the apoſtles: *e. g.* they mention ſeveral heretics, as we have already obſerved, that did not appear before the end of the apoſtolical age; they alſo record various circumſtances, which ſeem to ſhew, that the reign of heatheniſm in the Roman empire had terminated, and that Chriſtians enjoyed eaſe and proſperity; and they write in a ſtyle, make uſe of terms and appellations, and refer to practices and obſervances, and offices of the church, which did not obtain till a much later period than the age of the apoſtles. Several things in the conſtitutions appear to be unworthy of the apoſtles of Chriſt; of which numerous inſtances are cited by Dr. Lardner, and alſo by Dr. Jortin, *ubi infra*. Moreover, this work is not free from inconſiſtencies, which are a diſparagement to any writings, and they uſe a mode of expreſſion that betrays a later time than is pretended. From a recital and ample illuſtration of the ſeveral particulars, above curſorily mentioned, by the two learned writers already named, and of others which our limits will not allow us to introduce, we may juſtly conclude, that the conſtitutions, in eight books, are not a work of the apoſtles, and ſince they bear their names without ſufficient authority, they muſt be referred to the claſs of impoſtures. Although the exact time when this work was compiled, cannot be determined, and learned men have offered various conjectures, Dr. Lardner inclines to the opinion of thoſe, who think that it was compoſed in the latter part of the fourth, or the beginning of the fifth century. "The author," probably, ſays Dr. Lardner, "was a biſhop of a proud and haughty ſpirit, who was fond of church-power, and loved pomp and ceremony in religious worſhip." To this purpoſe Dr. Jortin ſays, that the conſtitutions repeatedly aſſert, "that a biſhop is a God, a God upon earth, and a king, and infinitely ſuperior to a king, and ruling over rulers and kings. They command Chriſtians to give him tribute as to a king, and to reverence him as a God, and to pay him tithes and firſt-fruits, according, ſay they, to God's command; and they ſtrictly forbid Chriſtians to make any inquiry, and to take any notice, whether he diſpoſe of theſe revenues well or ill." Sentiments theſe which ſeem to have been dictated at a time when there were Chriſtian emperors.

Many learned moderns, ſays Dr. Lardner, "think the author was an Arian; but I do not concern myſelf about that: the paſſages, which have been ſuppoſed to favour Arianiſm, make a very ſmall, or no part of the preceding collections; I have no reaſon, therefore, to bring that point into the concluſion. But I preſume, that none ever ſuſpected the author to be a Homoüſian." The author of this work, whoever he was, bears teſtimony to the ſcriptures; and appears to have received all thoſe books of the New Teſtament, which were all along generally received by Chriſtians. Lardner's works, vol. iv. part 2. ch. 85. p. 320—354. Jortin's Remarks on E. H. vol. i. p. 228—278.

Constitution, in a *Phyſical Senſe*, is uſed to denote the general condition of the body, as evinced by the peculiarities in the performance of its functions: ſuch are, the peculiar pre-diſpoſition to certain diſeaſes, or liability of particular organs to diſeaſe: the varieties in digeſtion, in muſcular power and motion, in ſleep, in the appetites, &c. &c. Some marked peculiarities of conſtitution are obſerved to be accompanied with certain external characters, ſuch as a particular colour and texture of the ſkin, and of the hair, and alſo with a peculiarity of form and diſpoſition of mind; all of which have been obſerved from the earlieſt times, and divided into claſſes, which have received names, during the prevalence of the humoral pathology, which they ſtill retain, in conſequence of the neglect of this important ſtudy by modern phyſicians. See Temperament.

Constitution, in *Political Economy*, is frequently uſed in common language as ſynonymous with government; but the conſtitution and the government of a country have different meanings, and are actually diſtinguiſhed by accurate writers. "By conſtitution we mean," ſays lord Bolingbroke, in his "Diſſertation on Parties" (Works, vol. ii. p. 130.), "whenever we ſpeak with propriety and exactneſs, that aſſemblage of laws, inſtitutions, and cuſtoms, derived from certain fixed principles of reaſon, directed to certain fixed objects of public good, that compoſe the general ſyſtem, according to which the community hath agreed to be governed. Whereas by government we mean, whenever we ſpeak in the ſame manner, that particular tenor of conduct which a chief magiſtrate, and inferior magiſtrates under his direction and influence, hold in the direction of public affairs." (See Government.) Conſtitution, ſays the ſame writer, in reference to our own country, is the rule by which our princes ought to govern at all times: government is that by which they actually do govern at any particular time. One may remain immutable; the other may, and as human nature is conſtituted, muſt vary. One is the criterion by which we are to try the other; for ſurely we have a right to do ſo, ſince, if we are to live in ſubjection to the government of our kings, our kings are to govern in ſubjection to the conſtitution; and the conformity or non-conformity of their government to it preſcribes the meaſure of our ſubmiſſion to them, according to the principles of the revolution, and of our preſent ſettlement, in both of which, though ſome remote regard was had to blood, yet the preſervation of the conſtitution manifeſtly determined the community to the choice then made of the perſons who ſhould govern. In order further to evince the difference between the conſtitution and the government of a country, lord Bolingbroke obſerves that "kings may have preceded lawgivers, for ought I know, or have poſſibly been the firſt lawgivers, and government by will have been eſtabliſhed before government by conſtitution. Theſeus might reign at Athens, and Eurytion at Sparta, long before Solon gave laws to one, and Lycurgus to the other of theſe cities. Kings had governed Rome, we know, and conſuls had preceded kings, long before the decemviri compiled a body of law; and the Saxons had their monarchs before Edgar, though the Saxon laws went under his name." Theſe examples plainly prove, "that however men might ſubmit voluntarily in the primitive ſimplicity of early ages, or be ſubjected by conqueſt to a government without a conſtitution, yet they were never long in diſcovering, that (as Hooker obſerves, Eccleſ. Pol. l. 1. § 10.) "to live by one man's will became the cauſe of all men's miſery;" and therefore "they ſoon rejected the yoke, or made it ſit eaſy on their necks." By the *conſtitution* of a country, ſays archdeacon Paley (Princ. of Moral and Political Philoſ. vol. ii. chap. 7.), is meant ſo much of its law, as relates to the deſignation and form of the legiſlature; the rights and functions of the ſeveral parts of the legiſlative body; the conſtruction, office, and juriſdiction of courts of juſtice. Accordingly, the conſtitution is one principal diviſion, ſection, or title of the code of public laws; diſtinguiſhed from the reſt only by the ſuperior importance of the ſubject of which it treats: and therefore the terms *conſtitutional* and *unconſtitutional*, mean legal and illegal. In England the ſyſtem of public juriſprudence is made up of acts of parliament, of deciſions of courts of law, and of immemorial uſages; conſequently, theſe are the principles of which the Engliſh conſtitution itſelf conſiſts; the ſources from which all our knowledge of its nature and limitations is to be deduced, and the authorities to which all appeal ought to be made, and by which every conſtitutional doubt and queſtion can alone be decided. This plain and intelligible definition will ſerve to diſcover the error of thoſe writers who abſurdly confound what is conſtitutional with what is expedient, and what is unconſtitutional with any meaſure which they adjudge in any reſpect to be detrimental or dangerous; and alſo of others, who aſcribe a kind of tranſcendent authority, or myſterious ſanctity, to the conſtitution, as if it were founded in ſome higher original than that which gives force and obligation to the ordinary laws and ſtatutes of the realm, or were inviolable on any other account than its intrinſic utility. An act of parliament, in England, can never be unconſtitutional, in the ſtrict and proper acceptation of the term; but in a lower ſenſe it may, *viz.* when it militates with the ſpirit, contradicts the analogy, or defeats the proviſion of other laws, made to regulate the form of government. Moſt of thoſe, ſays our author, who treat of the Britiſh conſtitution, conſider it as a ſcheme of government formerly planned and contrived by our anceſtors, in ſome certain era of our national hiſtory, and as ſet up in purſuance of ſuch regular plan and deſign. This is intimated in the expreſſions of thoſe who ſpeak of the "principles of the conſtitution," of bringing back the conſtitution to its "firſt principles," of reſtoring it to its "original purity," or "primitive model." This, in his opinion, is an erroneous conception of the ſubject. No ſuch plan was ever formed; conſequently no ſuch firſt principles, original model, or ſtandard exiſt; that is, as he conceives, there never was a date, or point of time in our hiſtory, when the government of England was to be ſet up anew, and when it was referred to any ſingle perſon, or aſſembly, or committee, to frame a charter for the future government of the country; or when a conſtitution, ſo prepared and digeſted, was by common conſent received and eſtabliſhed. The great charter, and the bill of rights, were wiſe and ſtrenuous efforts to obtain ſecurity againſt certain abuſes of regal power, by which the ſubject had been formerly aggrieved; but theſe were, either of them, much too partial modifications of the conſtitution to give it a new original. The conſtitution of England, like that of moſt countries in Europe, hath grown out of occaſion and emergency; from the fluctuating policy of different ages; from the contentions, ſucceſſes, intereſts, and opportunities of different orders and parties of men in the community. It reſembles one of thoſe old manſions, which, inſtead of being built all at once, after a regular plan, and according to the rules of architecture, at preſent eſtabliſhed, has been reared in different ages of the art, has been altered from time to time, and has been continually receiving additions and repairs ſuited to the taſte, fortune, or conveniency of its ſucceſſive proprietors; to ſuch a building we look in vain for the elegance and proportion, for the juſt order and correſpondence of parts, which we expect in a modern edifice; and which external ſymmetry, after all, contributes much more perhaps to the amuſement of the beholder, than the accommodation of the inhabitant.

Some of our approved hiſtorians, and political writers, have diſcovered, as they conceive, the origin of the Britiſh conſtitution in the government of the Anglo-Saxons, brought hither from Germany and the northern countries. To this purpoſe, it is alleged, that the government of the northern nations, which eſtabliſhed themſelves on the ruins of Rome, was always extremely free; and that the free conſtitutions then introduced, however impaired by the encroachments of preceding princes, ſtill preſerve an air of independence and legal adminiſtration, which diſtinguiſh the European nations; and if this part of the globe maintains ſentiments of liberty, honour, equity, and valour, ſuperior to the reſt of mankind, it is ſaid to have owed theſe advantages chiefly to the ſeeds implanted by the generous barbarians of the north. The Saxons who ſubdued Britain in the 5th century, as they enjoyed great liberty in their own country, obſtinately retained that invaluable poſſeſſion in their new ſettlement; and they imported into this iſland the ſame principles of independence, which they had inherited from their anceſtors. The chieftains, (for ſuch they were, more properly than kings or princes,) who commanded them in their military expeditions, ſtill poſſeſſed a very limited authority; and as the Saxons exterminated, rather than ſubdued, the ancient inhabitants; they were indeed tranſplanted into a new territory, but preſerved, without alteration, all their civil and military inſtitutions. Their manners and cuſtoms were wholly German; and the ſame picture of a fierce and bold liberty, which is drawn by the maſterly pencil of Tacitus, will ſuit thoſe founders of the Engliſh government. The king, ſo far from being inveſted with arbitrary power, was only conſidered as the firſt among the citizens; and his authority depended more on his perſonal qualities, than on his ſtation. The Anglo-Saxons, being an independent people, little reſtrained by law, and cultivated by ſcience, were not very ſtrict in maintaining a regular ſucceſſion of their princes. Although they paid great regard to the royal family, and aſcribed to it an undiſputed ſuperiority, they either had no rule, or none that was ſteadily obſerved, in filling the vacant throne; and preſent convenience, in that emergency, was more attended to than general principles. We are not, however, to ſuppoſe, that the crown was conſidered as altogether elective; and that a regular plan was traced by the conſtitution for ſupplying, by the ſuffrages of the people, every vacancy made by the demiſe of the firſt magiſtrate. All the changes which occurred in the royal ſucceſſion, and indeed the ordinary adminiſtration of government, required the expreſs concurrence, or at leaſt the tacit acquieſcence of the people. The Anglo-Saxon monarchies were not, ſtrictly ſpeaking, either elective or hereditary; and though the deſtination of a prince might often be followed in appointing his ſucceſſor, they could not be regarded as wholly teſtamentary. The ſtates by their ſuffrage might ſometimes eſtabliſh a ſovereign; but they more frequently recognized the perſon whom they found eſtabliſhed. Our knowledge of the Anglo-Saxon hiſtory is ſo imperfect, that it is not eaſy to aſcertain all the prerogatives of the crown and privileges of the people, or to give an exact delineation of that government. It is probable, that the conſtitution might be ſomewhat different in the different kingdoms of the HEPTARCHY, and that it changed conſiderably during the courſe of ſix centuries, which elapſed from the firſt invaſion of the Saxons, till the Norman conqueſt. It appears, however, that at all times, and in all the kingdoms, there was a national council, called a *wittenagemot*, or aſſembly of the wiſe men, as the term imports, whoſe conſent was requiſite for enacting laws, and for ratifying the chief acts of public adminiſtration. The preambles to all the laws of Ethelbert, Ina, Alfred, Edward the Elder, Athelſtan, Edmund, Edgar, Ethelred, and Edward the Confeſſor; even thoſe to the laws of Canute, though a kind of conqueror, ſupply unqueſtionable proofs every where of a limited and legal government. But who were the conſtituent members of this wittenagemot, is a queſtion that has not been determined with certainty by antiquarians. (See WITTENAGEMOT.) Nevertheleſs, it is certain, that whatever we may determine concerning the wittenagemot, in whom, with the king, the legiſlature reſided, the Anglo-Saxon government, in the period preceding the Norman conqueſt, was become extremely ariſtocratical; the royal authority was very limited; and the people, even if admitted to that aſſembly, were deemed of little or no importance and conſideration. Upon the whole, notwithſtanding the ſeeming liberty, or rather licentiouſneſs, of the Anglo-Saxons, the great body even of the free citizens, in thoſe ages, really enjoyed much leſs true liberty, than where the execution of the laws is the moſt ſevere, and where ſubjects are reduced to the ſtricteſt ſubordination and dependence on the civil magiſtrate. But though the general ſtrain of the Anglo-Saxon government ſeems to have become ariſtocratical, there were ſtill conſiderable remains of the ancient democracy, which, though inſufficient to protect the loweſt of the people, without the patronage of ſome great lord, might nevertheleſs give ſecurity, and ſome degree of dignity, to the gentry or inferior nobility. The adminiſtration of juſtice, in particular, by the courts of the decennary, the hundred, and the county, was well calculated to defend general liberty, and to reſtrain the power of the nobles. The county courts, in particular, where all the freeholders were admitted, formed a wide baſis for the government, and furniſhed conſiderable checks on the ariſtocracy. However, the great influence of the lords over their ſlaves and tenants, the clientſhip of the burghers, the total want of a middle claſs of men, the extent of the monarchy, the looſe execution of the laws, and the continued diſorders and convulſions of the ſtate, ſufficiently evince, that the Anglo-Saxon government became at laſt extremely ariſtocratical; and the events, during the period immediately preceding the conqueſt, confirm this inference or conjecture. If we direct our views to a period much more ancient than that of the eſtabliſhment of the Anglo-Saxon government, and prior to the invaſion of the Romans, we ſhall find that the governments of the Britons, who were divided into many ſmall nations or tribes, though monarchical, were free, as well as thoſe of all the Celtic nations; and the common people ſeem to have enjoyed more liberty among them, than among the nations of Gaul, from whom they were deſcended.

Other writers have maintained, that the government, eſtabliſhed by the Anglo-Saxon princes, had little more affinity with the preſent conſtitution, than the general relation common indeed to all the governments founded by the northern nations, that of having a king and a body of nobility; and the ancient Saxon government is ſaid to be "left us in ſtory," (according to the ſtatement of ſir William Temple—Int. to the Hiſt. of England,) but like to many antique, broken, or defaced pictures, which may ſtill repreſent ſomething of the coſtume and faſhions of thoſe ages, though little of the true lines, proportions, or reſemblance." According to theſe writers, it is at the era of the conqueſt, that we are to look for the real foundation of the Engliſh conſtitution. From that period, ſays Spelman, "novus ſeclorum naſcitur ordo." William of Normandy, it is ſaid, having defeated Harold, and made himſelf maſter of the crown, ſubdued the ancient fabric of the Saxon legiſlation; he exterminated, or expelled, the former occupiers of lands, in order to diſtribute their poſſeſſions among his followers, and eſtabliſhed the feudal ſyſtem of government, as better adapted to his ſituation, and indeed the only one of which he poſſeſſed a competent idea. A diſtinction, however, ought to be made between the *government* of William I., which was very tyrannical, and the *conſtitution* eſtabliſhed under him in this kingdom, which was no abſolute monarchy, but an ingraftment of the feudal tenures and other cuſtoms of Normandy upon the ancient Saxon laws of Edward the Confeſſor. He more than once ſwore to maintain thoſe laws, and in the 4th year of his reign, confirmed them in parliament; yet not without great alterations, to which the whole legiſlature agreed, by a more complete introduction of the ſtrict feudal law, as it was practiſed in Normandy.

But that the liberty of the ſubject was not deſtroyed by theſe alterations to the degree which ſome writers have ſuppoſed, plainly appears, ſays lord Lyttelton, (Hiſt. Henry II. vol. i. p. 59.) by the very ſtatutes which William enacted; in one of which we find an expreſs declaration, "that all the freemen in his kingdom ſhould hold and enjoy their lands and poſſeſſions free from all unjuſt exactions and from all tallage; ſo that nothing ſhould be exacted or taken of them but their free ſervice, which they by right owed to the crown, and were bound to perform." It is further ſaid, "that this was ordained and granted to them as an hereditary right for ever, *by the common council of the kingdom;* which very remarkable ſtatute is juſtly ſtyled by a learned author (Nathanael Bacon) *the firſt Magna Charta of the Normans:* and it extended no leſs to the Engliſh than to the Normans. But it was ill obſerved by William, who frequently acted as if his will had been the only law to both nations. It muſt be alſo allowed, that by the interpoſition of many *Meſne Lords* between the crown and the people, and by many offices of judicature and military command being rendered hereditary, which under the Saxons had been either elective, or granted for a ſhort time, the conſtitution became more ariſtocratical than before, more unequally balanced, and, in ſome reſpects, more oppreſſive to the inferior orders of freemen. Nor was the condition of the nobles themſelves to be envied. For there were certain burthens annexed to their ſyſtem of fiefs, which, as they naturally grew out of that policy, were impoſed on the higheſt vaſſals as well as on the loweſt, and were more grievous than any which the Saxons had borne under their conſtitution. In proceſs of time the exceſſive power arrogated and exerciſed by the king contributed to eſtabliſh and guard the freedom of the Britiſh conſtitution; becauſe this exceſs gave riſe to the ſpirit of union and of concerted reſiſtance. Poſſeſſed of extenſive demeſnes, the king found himſelf independent; and veſted with the moſt formidable prerogatives, he cruſhed at pleaſure the moſt powerful barons in the realm. It was, therefore, only by cloſe and numerous confederacies that thoſe barons could reſiſt the tyranny of the ſovereign; and for this purpoſe they were conſtrained to aſſociate the people with themſelves, and to render them partakers of public liberty. As acts and inſtances of tyranny on the part of the conqueror were multiplied, the confederacies of the barons and of their vaſſals became more general and more vigorous; and the people at large, inſtructed and inſpirited by their leaders, ſtipulated conditions for themſelves, and inſiſted that, for the future, every individual ſhould be intitled to the protection

tion of the laws. Thus did thoſe rights, with which the lords had ſtrengthened themſelves, in order to oppoſe the tyranny of the crown, become a bulwark, which was, in time, to reſtrain their own. It was in the reign of Henry I., about forty years after the conqueſt, that the operation of theſe cauſes produced effect. As the nation had reſolved to beſtow the crown on a prince, who ſhould acquire and hold it under no other claim than a *compact* with his people, the title of the king became thus a kind of ſecurity for the liberty of the ſubject. In order to give that liberty a more ſolid and laſting eſtabliſhment, they demanded a charter; which Henry granted ſoon after his coronation, as he had ſworn to do before he was crowned. By this he reſtored the Saxon laws which were in uſe under Edward the Confeſſor, with ſuch alterations, or (as he ſtyled them) *emendations, as had been made in them by his father with the advice of his parliament;* at the ſame time *annulling all evil cuſtoms, and illegal ſanctions, by which the realm had been unjuſtly oppreſſed.* Some of thoſe grievances were ſpecified in the charter, and the redreſs of them was there expreſsly enacted. It alſo contained very conſiderable mitigations of thoſe feudal rights claimed by the king over his tenants, and by them over theirs, which were either the moſt burthenſome in their own nature, or had been made ſo by an abuſive extenſion. In ſhort, all the liberty, that could well be conſiſtent with the ſafety and intereſt of the lord in his fief, was allowed to the vaſſal by this charter, and the profits due to the former were ſettled according to a determined and moderate rule of law. "This," ſays ſir Henry Spelman, "was the original of king John's Magna Charta, containing moſt of the articles of it, either particularly expreſſed or in general, under the confirmation it gives to the laws of Edward the Confeſſor." Thoſe are therefore much miſtaken, who have ſuppoſed all the privileges granted in *Magna Charta* were *innovations* extorted by the arms of rebels from king John;—a notion which ſeems to have been firſt taken up, not ſo much out of ignorance, as from a baſe motive of adulation to ſome of our princes in later times, who, endeavouring to graſp at abſolute power, were deſirous of any pretence to conſider thoſe laws, which ſtood in their way, as violent encroachments made by the barons on the ancient rights of the crown; whereas they were in reality reſtitutions and ſanctions of ancient rights enjoyed by the nobility and people of England in former reigns;—or limitations of powers which the king had illegally and arbitrarily ſtretched beyond their due bounds. In ſome reſpects, ſays Lord Lyttelton, this charter of Henry I. was more advantageous to liberty than *Magna Charta* itſelf. Henry II. in a parliament held in London, A. D. 1155, granted a charter of liberties confirming that of his grandfather, Henry I., already mentioned. In conſequence of the legal rights eſtabliſhed by this excellent prince and the mixture of Saxon cuſtoms, which mitigated and tempered the Norman inſtitution, the conſtitution of England was the beſt feudal ſyſtem ſubſiſting, at that time, in any part of the world. The honour of eſtabliſhing in the Engliſh conſtitution itinerant judges belongs to Henry II., by whom this inſtitution was revived and regularly ſettled in the 22d year of his reign, with the advice and concurrence of his parliament held at Northampton. The extenſion of trials by juries to civil cauſes may alſo be well eſteemed a principal glory of this reign. Although ſome veſtiges of that method of trial appear among the Anglo-Saxons; yet Spelman ſays, that the uſe of trials by 12 men before the conqueſt was rare, and did not prevail in any great degree, till the reign of Henry II. (See JURY and *Grand* ASSISE.) The deſpotic reign of king John excited through the kingdom a general confederacy againſt him and conſtrained him, A. D. 1215, to ſign the famous deed, commonly called the great charter or *Magna Charta,* which either granted or ſecured very important liberties and privileges to every order of men in the kingdom; to the clergy, to the barons, and to the people. (See MAGNA *Charta.*) By this charter, the rigour of the feodal laws was greatly mitigated in favour of the lords; and conditions were alſo ſtipulated in favour of the numerous body of the people, who had concurred to obtain it, and who claimed, with ſword in hand, ſhare in that ſecurity which it was deſigned to eſtabliſh. This charter was confirmed in parliament by king Henry III., A. D. 1217, with the addition of ſome articles to prevent the oppreſſions by ſheriffs; and alſo with an additional charter of foreſts. Accordingly, theſe famous charters have ſubſiſted nearly in their original form, during many generations, as the peculiar favourites of the Engliſh nation; and they have been juſtly eſteemed as the moſt ſacred rampart to national liberty and independence. As they ſecured the rights of all orders of men, they were anxiouſly defended by all, and became the baſis, in a manner, of the Engliſh conſtitution, and a kind of original contract, which both limited the authority of the king, and enſured the conditional allegiance of his ſubjects. King Edward I. who made it a rule in his own conduct to obſerve, except on extraordinary occaſions, the privileges ſecured to the barons by the great charter, acquired a right to inſiſt upon their obſervance of the ſame charter towards their vaſſals and inferiors. By the ſtatute (25 Edw. I.) called *Confirmatio Chartarum,* (the confirmation of which was renewed eleven times in the courſe of his reign,) he directed the great charter to be allowed as the common law; all judgments contrary to it are declared void; copies of it are ordered to be ſent to all cathedral churches, and read twice a year to the people; and ſentence of excommunication is directed to be as conſtantly denounced againſt all thoſe, who by word, deed, or counſel, act contrary to it, or in any degree infringe it. He alſo, in the ſtatute *De Tallagio non Concedendo,* (24 Edw. I.) decreed, that no tax ſhould be laid, nor impoſt levied, without the joint conſent of the lords and commons. This important ſtatute, in conjunction with *Magna Charta,* forms the baſis of the Engliſh conſtitution. Under Edward II. the commons, feeling their importance, began to annex petitions to the bills by which they granted ſubſidies; and this was the dawn of their legiſlative authority. Under Edward III., they declared they would not, in future, acknowledge any law to which they had not expreſsly aſſented. Soon after this, they exerciſed a privilege, in which conſiſts, at this time, one of the great balances of the conſtitution: they impeached, and procured to be condemned, ſome of the firſt miniſters of ſtate. Under Henry IV., they refuſed to grant ſubſidies before an anſwer had been given to their petitions. In a word, the fundamental articles of our free conſtitution have been aſſerted and confirmed by a multitude of ſtatutes, (ſir Edward Coke is ſaid to reckon thirty-two,) from Edward I. to Henry IV. Then, after a long interval, they were corroborated by the *petition of right,* which was a parliamentary declaration of the liberties of the people, aſſented to by king Charles I., in the beginning of his reign. This famous act was ſoon followed by the ſtill more ample conceſſion made by that unhappy prince to his parliament, before the fatal rupture between them; and by the many ſalutary laws, particularly the *habeas corpus,* paſſed under Charles II. To theſe ſucceeded the *bill of rights,* or declaration delivered by the lords and commons to the prince and princeſs of Orange, 13th February, 1688; and afterwards enacted in parliament,

ment, when they became king and queen: which declaration terminates with theſe remarkable words: "And they do claim, demand, and inſiſt upon, all and ſingular, the premiſes, as their undoubted right and liberties." And the act of parliament itſelf (1 W. & M. ſt. 2. c. 2.) recogniſes "all and ſingular the rights and liberties, aſſerted and claimed in the ſaid declaration, to be the true, ancient, and indubitable rights of the people of this kingdom." The Révolution of 1688 may, therefore, be juſtly deemed the third grand epoch in the hiſtory of the Engliſh conſtitution. The great charter had marked out the limits within which the royal authority ought to be confined; ſome outworks were raiſed in the reign of Edward I.; but it was at the Revolution that the circumvallation was completed. "It was at this era," ſays De Lolme, "that the true principles of civil ſociety were diſtinctly ſpecified and fully eſtabliſhed. By the expulſion of a king, who had violated his oath, the doctrine of Reſiſtance, that ultimate reſource of an oppreſſed people, was confirmed beyond a doubt. By the excluſion of a family, hereditarily deſpotic, it was finally determined, that nations are not the property of kings. The principles of Paſſive Obedience, the divine and indefeaſible right of kings; in a word, the whole ſcaffolding of falſe and ſuperſtitious notions, by which the royal authority had till then been ſupported, fell to the ground: and in the room of it were ſubſtituted the more ſolid and durable foundations of the love of order, and a ſenſe of the neceſſity of civil government among mankind." The liberty of the preſs, the bulwark and guardian of a free conſtitution, was, properly ſpeaking, eſtabliſhed four years afterwards, in conſequence of the refuſal of the parliament to continue any longer the reſtrictions to which it had before been ſubject. Finally, the liberties of the Britiſh conſtitution were again aſſerted at the commencement of the laſt century, in the *act of ſettlement*, (12 & 13 W. III. c. 2.) by which the crown was limited to his preſent majeſty's illuſtrious houſe; and ſome new proviſions were added, at the ſame fortunate era, for better ſecuring our law, religion, and liberties, which the ſtatute declares to be "the birth-right of the people of England," according to the ancient doctrine of the common law.

The diſtinguiſhing excellence of the Britiſh conſtitution, which has been ſometimes called a mixed government, and ſometimes a limited monarchy, conſiſts in its being formed by a combination of the three regular ſpecies of government, *viz.* the monarchy, reſiding in the King; the ariſtocracy, in the Houſe of Lords, and the democracy or republic being repreſented by the Houſe of Commons. To this purpoſe Cicero declares himſelf of opinion, (in his Fragments, *de rep.* l. 2.) "eſſe optimè conſtitutam rempublicam, quæ ex tribus generibus illis, regali, optimo, et populari, ſit modicè confuſa." As the executive power of the laws, in the Britiſh conſtitution, is lodged in a ſingle perſon, they have all the advantages of ſtrength and diſpatch, that are to be found in the moſt abſolute monarchy: and as the legiſlature of the kingdom is entruſted to three diſtinct powers, entirely independent of each other; and as this aggregate body, actuated by different ſprings, and attentive to different intereſts, compoſes the Britiſh parliament, and has the ſupreme diſpoſal of every thing; no inconvenience can be attempted by either of the three branches, which will not, according to the theory of the conſtitution, be withſtood by one of the other two: each branch being armed with a negative power, ſufficient to repel any innovation which it ſhall think inexpedient or dangerous. Whereas, if the ſupreme power were lodged in any one of the branches ſeparately, we muſt be expoſed to the inconveniences of either abſolute monarchy, ariſtocracy, or democracy; and ſo want two of the three principal ingredients of good polity, either virtue, wiſdom, or power. If it were lodged in any two of the branches, *e.g.* in the king and houſe of lords, our laws might be providently made, and well executed, but they might not have always the good of the people in view: if lodged in the king and commons, we ſhould want that circumſpection and mediatory caution, which the wiſdom of the peers is to afford: if the ſupreme rights of legiſlature were lodged in the two houſes only, and the king had no negative on their proceedings, they might be tempted to encroach upon the royal prerogative, or perhaps to aboliſh the kingly office, and thereby weaken (if not totally deſtroy) the ſtrength of the executive power. But the conſtitutional government of this iſland is ſo admirably tempered and compounded, that nothing can endanger or hurt it, but deſtroying the equilibrium of power between one branch of the legiſlature and the reſt. For if events ſhould happen, that the independence of any one of the three ſhould be loſt, or that it ſhould become ſubſervient to the views of the other two, there would ſoon be an end of our conſtitution. The legiſlature would be changed from that, which (upon the ſuppoſition of an original contract, either actual or implied) is preſumed to have been originally ſet up, by the general conſent and fundamental act of the ſociety: and ſuch a change, however effected, is, according to Mr. Locke, (on Government, part ii. § 212.) who, ſays judge Blackſtone, perhaps carries his theory too far, at once into an entire diſſolution of the bands of government; and the people are thereby reduced to a ſtate of anarchy, with liberty to conſtitute to themſelves a new legiſlative power.

Archdeacon Paley, in his diſcuſſion of this ſubject, has ſtated the expedients by which the Britiſh conſtitution provides for the *intereſt of its ſubjects*, and for its own *preſervation*. With a view to the firſt of theſe purpoſes, it promotes the eſtabliſhment of ſalutary public laws, by rendering every citizen of the ſtate capable of becoming a member of the ſenate, and by inveſting every ſenator with the right of propounding to the deliberation of the legiſlature whatever law he pleaſes. In order to the attainment of this object, it provides ſuch repreſentatives of the people, with reſpect to their rank, condition, and character, the mode of their election, as well as the publicity and utility of their parliamentary deliberations, as ſhall be moſt likely to anſwer the end of their appointment, and to ſatisfy their conſtituents. (See COMMONS and PARLIAMENT.) For preventing deſtructive contentions for the ſupreme power, and for ſecuring the advantages of deciſion, ſecrecy, and diſpatch, which belong to the reſolutions of monarchical counſels, and other important objects, the conſtitution has committed the executive government to the adminiſtration and limited authority of our hereditary king. (See KING.) The Britiſh conſtitution has alſo guarded the ſafety of the people in the two articles of *taxation* and *puniſhment* by the moſt ſtudious precautions. With regard to *taxation*, this buſineſs is excluſively reſerved to the popular part of the conſtitution, who, it is preſumed, will not tax themſelves, nor their fellow-ſubjects, without being firſt convinced that the aids which they grant are neceſſary. The application of the public ſupplies is alſo watched with the ſame circumſpection as the aſſeſſment. The national expenditure is accounted for in the houſe of commons, and computations of the charge, appropriated to any particular purpoſe, are previouſly ſubmitted to the ſame tribunal. In the infliction of *puniſhment*, the power of the crown, and of the magiſtrate appointed by the crown, is confined by the moſt preciſe limitations: the offender's guilt, being ſubmitted to the judgment of 12 men, of his own order, and the nature and degree of the puniſhment being aſcertained by fixed laws. In order to prevent arbitrary or clandeſtine confinement, with all its injurious conſequences, the conſtitution has provided with extreme ſolicitude. The ancient writ of habeas corpus; the habeas corpus act of Charles II., and the practice and determinations of our ſovereign courts of juſtice founded upon theſe laws, afford a complete remedy for every conceivable caſe of illegal impriſonment. (See theſe articles; and ſee alſo TREASON.) The conſtitution has alſo provided for its own preſervation, by ſecuring each part of the legiſlature in the exerciſe of the powers aſſigned to it, from the encroachment of the other parts. This ſecurity is ſometimes called the *balance of the conſtitution*; and the political equilibrium, which this phraſe denotes, conſiſts in two contrivances—a balance of power, and a balance of intereſt. By the former is meant, that one part of the legiſlature poſſeſſes no power, the abuſe, or exceſs of which, is not checked by ſome antagoniſt power reſiding in another part. Thus, the power of the two houſes of parliament to frame laws, is checked by the king's negative; and, on the other hand, the application of this negative is checked by the privilege which parliament poſſeſſes, of refuſing ſupplies of money to the exigencies of the king's adminiſtration. The conſtitutional maxim "that the king can do no wrong," is balanced by another maxim, not leſs conſtitutional, "that the illegal commands of the king do not juſtify thoſe who aſſiſt, or concur, in carrying them into execution;" and alſo, "that the acts of the crown acquire not any legal force, until authenticated by the ſubſcription of ſome of its great officers." In connection with this maxim, we might mention the check which parliament holds over the adminiſtration of public affairs, in the practice of addreſſing the king, for the purpoſe of knowing by whoſe advice he reſolved upon a particular meaſure, and of puniſhing the authors of that advice for their pernicious counſel. Again, the power of the crown to direct the military force of the kingdom, is balanced by the annual neceſſity of reſorting to parliament for the maintenance and government of that force. The prerogative of the king, in declaring war, is checked by the privilege which the houſe of commons poſſeſſes, of granting or withholding ſupplies for carrying it on. The king's choice of his miniſters, is controlled by the obligation he is under of appointing thoſe men to offices in the ſtate, who are found capable of managing the affairs of his government, with the two houſes of parliament.

By the *balance of intereſt*, which accompanies and gives efficacy to the *balance of power*, is meant this, that the reſpective intereſts of the three eſtates of the empire, are ſo diſpoſed and adjuſted; that whichever of the three ſhall attempt any encroachment, the other two ſhall unite in reſiſting it. The exerciſe of arbitrary power, on the part of the king, would contract the power and privileges of the commons, degrade their dignity, and endanger their independence. It would alſo be no leſs formidable to the grandeur of the ariſtocracy than fatal to the liberty of the republic; as it would reduce the nobility from their hereditary participation in the national councils, which conſtitutes their true greatneſs, to the low and ſervile ſtate of making a part of the empty pageantry of a deſpotic court. On the other hand, if the commons ſhould entrench upon the crown, the houſe of lords, attached to the monarchy which gives them their diſtinction, would inſtantly receive an alarm from every new ſtretch of popular power. If the nobles themſelves ſhould attempt to revive the ſuperiority, which was exerciſed by their anceſtors under the feudal conſtitution, the king and the people would alike remember how the one had been inſulted, and the other enſlaved, by that barbarous tyranny. After all it ſhould be remembered, that there is a wide difference between the conſtitution, or the theory of government, and the actual exerciſe of it, nor ſhould thoſe anomalies, or irregularities, which occur in peculiar circumſtances, or periods of the public adminiſtration, be charged on the conſtitution itſelf. It is a well-known, and often cited obſervation of Monteſquieu, in reference to the Britiſh conſtitution, "as all things have an end, the ſtate we are ſpeaking of (viz. England,) will loſe its liberty, and periſh. Have not Rome, Sparta, and Carthage periſhed? It will periſh when the legiſlative powers ſhall be more corrupt than the executive." Lyttelton's Hiſt. of Hen. II. Hume's Hiſt. vol. i. ii. and iii. De Lolme's Conſtitution of England. Blackſt. Com. v. i. Paley's Principles, vol. ii. ch. 7. Rapin's Hiſt. of Eng. vol. i. Monteſq. Spirit of Laws, vol. i. b. xi. chap. 6.

CONSTRICTION, compounded of *con*, *together*; and *ſtringere*, *to tie* or *cloſe up*; the act of binding, or drawing the parts of a thing cloſe together.

CONSTRICTOR CUNNI, in *Myology*, a name applied to the ſphincter muſcle of the vagina. See GENERATION, *organs of*.

CONSTRICTOR *iſthmi faucium*, one of the muſcles belonging to the ſoft palate. See DEGLUTITION.

CONSTRICTOR *naſi*. See COMPRESSOR.

CONSTRICTOR *oris*. See ORBICULARIS *Oris*.

CONSTRICTORES PHARYNGIS. See DEGLUTITION.

CONSTRUCTION, in *Geometry*, the art or manner of drawing, or deſcribing a figure, ſcheme, the lines of a problem, or the like. The equality of the lines of ſuch a triangle, &c. is demonſtrated from their conſtruction.

CONSTRUCTION *of equations*, is the method of reducing a known equation into lines and figures; whereby the truth of the rule, canon, or equation, may be demonſtrated geometrically. Or, it is the method of finding the roots or unknown quantities of an equation, by the geometrical conſtructions of right lines or curves, according to the order or rank of the equation. The roots of any equation may be determined; that is, the equation may be conſtructed, by the interſections of a ſtraight line with another line or curve of the ſame dimenſions with thoſe of the equation to be conſtructed; for the roots of the equation are the ordinates of the curve at the points of interſection with the right line; and it is well known, that a curve may be cut by a right line in as many points as its dimenſions amount to. Thus, a *ſimple* equation will be conſtructed by the interſection of one right line with another: a quadratic equation, or an affected equation of the *ſecond* rank, by the interſections of a right line with a circle, or any of the conic ſections, which are lines of the ſecond order, and which may be cut by the right line in two points, which will give the two roots of the quadratic equation. A cubic equation may be conſtructed by the interſection of the right line with a line of the third order, &c. &c. But if, inſtead of the right line, ſome other line of a higher order be uſed; then the ſecond line, whoſe interſections with the former are to determine the roots of the equation, may be taken as many dimenſions lower as the former is taken higher. And, in general, an equation of any degree may be conſtructed by the interſections of two lines whoſe dimenſions, multiplied together, produce the dimenſion of the given equation. Thus, the interſections of a circle with the conic ſections, or of thoſe with each other, will conſtruct the biquadratic equations or thoſe of the fourth power, becauſe $2 \times 2 = 4$; and the interſections of the circle or conic ſections with a line of the third order, will conſtruct the equations of the fifth and ſixth powers, &c. &c. Hence it appears, that the method of conſtructing equations is different, according to the diverſity of equations.

To conſtruct a ſimple equation. The whole myſtery conſiſts in this, that the fractions, to which the unknown quantity is equal, be reſolved into proportional terms: the method of which will be better ſhewn by examples than it can be taught by many rules.

1. Suppoſe $x = \frac{ab}{c}$, or $cx = ab$; then will $c : a :: b : x$, to be determined by the method of finding a fourth proportional.

2. If $x = \frac{b^2}{a}$, or $ax = b^2$; then $a : b :: b : x$, a third proportional to a and b.

3. Suppoſe $x = \frac{abc}{de}$; let $d : a :: b : \frac{ab}{d}$. This fourth proportional found, being called g; $x = \frac{gc}{e}$, which is therefore found as in the firſt caſe.

4. Suppoſe $x = \frac{aa - bb}{c}$, or $cx = a^2 - b^2$. Since $aa - bb = (a + b) \times (a - b)$; $c : a + b :: a - b : x$, a fourth proportional to c, $a + b$ and $a - b$.

5. Suppoſe $x = \frac{ab}{c} + \frac{adc}{be}$. Find, as before, $g = \frac{ab}{c}$, and $f = \frac{adc}{be}$. Then will $x = g + f$ be the ſum of the lines g and f.

6. Suppoſe $x = \frac{a^2 b + bcd}{af + cg}$. Seek $\frac{cg}{a}$, and let $f + \frac{cg}{a} = h$; then will $af + cg = ah$; conſequently, $x = \frac{a^2 b + bcd}{ah}$. Thus is the preſent caſe brought to the preceding one.

7. Suppoſe $x = \frac{a^2 b - bad}{af + bc}$. Find $\frac{af}{b}$, and make $\frac{af}{b} + c = h$; then will $af + bc = bh$. Hence, $x = \frac{a^2 b - bad}{bh} = \frac{a^2 - ad}{h}$. Conſequently, $hx = a^2 - ad = a \times a - d$; and $h : a :: a - d : x$.

8. Suppoſe $x = \frac{a^2 + b^2}{c}$, or $cx = a^2 + b^2$. Conſtruct the triangle ABC (*Plate* I. *Analyſis*, *fig.* 8.) whoſe ſide $AB = a$, $BC = b$; then will $AC = \sqrt{a^2 + b^2}$. Let $AC = m$; then will $a^2 + b^2 = m^2$. And therefore $x = \frac{m^2}{c}$; conſequently, $c : m :: m : x$, a third proportional to c and m.

9. Suppoſe $x = \frac{a^2 - b^2}{c}$. On AB (*fig.* 9.) $= a$, deſcribe a ſemicircle, and therein ſet off $AC = b$. Since the triangle ACB is rectangular; $CB = \sqrt{a^2 - b^2}$. Let $CB = m$; then will $x = \frac{m^2}{c}$; conſequently, $c : m :: m : x$.

10. Suppoſe $x = \frac{a^2 b + bcd}{af + bc}$. Say, $b : a :: f : \frac{fa}{b}$; and let $\frac{fa}{b} + c = h$; then will $bc + af = bh$. Hence, $x = \frac{a^2 b + bcd}{bh} = \frac{a^2 + cd}{h}$. Find betwixt $AC = c$ (*fig.* 10.) and $CB = d$, a mean proportional $CD = \sqrt{cd}$. Let $CE = a$; then will $DE = \sqrt{a^2 + cd}$. Call this m; then will $x = \frac{m^2}{h}$; conſequently, $h : m :: m : x$.

To conſtruct a quadratic equation geometrically. Since quadratic equations may be reduced to ſimple ones, thoſe may likewiſe be conſtructed from the methods already laid down: for if the equation be pure, $x^2 = ab$; then will $a : x :: x : b$; wherefore we ſhall find $x = \sqrt{ab}$; and therefore if between $AC = a$, and $BC = b$, we find a mean proportional DC, this will be equal to x.

If the quadratic be affected, *e. g.* $x^2 + 2ax = b^2$, then form the right-angled triangle ACB (*fig.* 11.), whoſe baſe AB is a, and perpendicular BC is b; and on the centre A, with the radius AC, deſcribe the ſemicircle DCE, then will DB and DE be the two roots, *viz.* the affirmative and the negative, of the given quadratic equation. For by reſolving the quadratic, we ſhall have $x = a \pm \sqrt{b^2 + a^2} = AB \pm \sqrt{\overline{BC}^2 + \overline{AB}^2} = AB \pm \sqrt{\overline{AC}^2} = AB \pm AC$, *i. e.* DB or BE, with their proper ſigns. If the quadratic be $x^2 - 2ax = b^2$, then the conſtruction will be the ſame with that of the preceding one, $x^2 + 2ax = b^2$. But if the form be $2ax - x^2 = b^2$; form a right-angled triangle FGH (*fig.* 12), whoſe hypothenuſe FG is a, and perpendicular GH is b; then with the radius FG and centre F deſcribe a ſemicircle IGK; and IH and HK will be the two roots of the given equation $2ax - x^2 = b^2$, or $x^2 - 2ax = b^2$. Maclaurin's Algebra, part iii. chap. 2. and Simpſon's Algebra, p. 269.

To conſtruct cubic and biquadratic equations. The roots of a biquadratic equation may be determined by the interſections of two conic ſections; for the equation by which the ordinates from the four points in which theſe conic ſections may cut one another can be determined, will ariſe to four dimenſions; and the conic ſections may be aſſumed in ſuch a manner, as to make this equation coincide with any propoſed biquadratic: ſo that the ordinates from theſe four interſections will be equal to the roots of the propoſed biquadratic.

If one of the interſections of the conic ſection falls upon the axis, then one of the ordinates vaniſhes, and the equation by which theſe ordinates are determined, will then be of three dimenſions only, or a cubic; to which any propoſed cubic equation may be accommodated. So that the three remaining ordinates will be the three roots of that propoſed cubic. The conic ſections for this purpoſe ſhould be ſuch as are moſt eaſily deſcribed. The circle may be one, and the parabola is uſually aſſumed for the other.

Let APE (*fig.* 13.) be the common Apollonian parabola. Take on its axis the line AB = half of its parameter. Let C be any point in the plane of the parabola, and from it as a centre deſcribe, with any radius CP, a circle meeting the parabola in P. Let PM, CD, be perpendiculars on the axis in M and D, and let CN, parallel to the axis, meet PM in N.

Then will always $CP^2 = CN^2 + NP^2$ (47 E. 1.)

Put $CP = a$, the parameter of the parabola $= b$, $AD = c$, $DC = d$, $AM = x$, $PM = y$.

Then $CN^2 = \overline{x \overset{\backsim}{+} c}|^2$, $NP^2 = \overline{y \overset{\backsim}{+} d}|^2$; and $\overline{x \overset{\backsim}{+} c}|^2 + \overline{y \overset{\backsim}{+} d}|^2 = a^2$. ($x \backsim c$ is the difference of x and c indefinitely, whichever of the two is greateſt. That is, $x^2 \pm 2cx + c^2 + y^2 \pm dy + d^2 = a^2$. But from the nature of the parabola, $y^2 = bx$, and $x^2 = \frac{y^4}{b^2}$; ſubſtituting therefore theſe values for x^2, and x, it will be $\frac{y^4}{b^2} \pm \frac{2cy^2}{b} + y^2 \pm 2dy + c^2 + d^2 - a^2 = 0$. Or, multiplying by b^2, $y^4 \pm \overline{2bc + b^2} \times y^2 \pm 2db^2 \times y + \overline{c^2 + d^2 - a^2} \times b^2 = 0$. Which may repreſent any biquadratic equation that wants the ſecond term; ſince ſuch values may be found for a, b, c, and d, by comparing this with any propoſed biquadratic, as to make them coincide. And then the ordinates from the points, P, P, P, P, on the axis will be equal to the roots of that propoſed biquadratic. And this may be done, though the parameter of the parabola (viz. b) be given: that is, if you have a parabola already made or given, by it alone you may reſolve all biquadratic equations, and you will only need to vary the centre of your circle and its radius.

If the circle deſcribed from the centre, C, paſs through the vertex A, (*fig.* 14.) then $\text{CP}^2 = \text{CA}^2 = \text{CD}^2 + \text{AD}^2$, that is, $a^2 = d^2 + c^2$; and the laſt term of the biquadratic $(c^2 + d^2 - a^2)$ will vaniſh; therefore, dividing the reſt by y, there ariſes the cubic, $y^{3*} \pm \overline{2bc + b^2} \times y \pm 2db^2 = 0$. Let the cubic equation propoſed to be reſolved be $y^{3*} \pm py \pm r = 0$. Compare the terms of theſe two equations, and you will have $\pm 2bc + b^2 = \pm p$, and $\pm 2db^2 = \pm r$, or, $\mp c = \frac{b}{2} \mp \frac{p}{2b}$, and $d = \pm \frac{r}{2b^2}$. From which you have this conſtruction of the cubic $y^{3*} \pm py \pm r = 0$, by means of any given parabola A P E.

From the point B *take in the axis (forward, if the equation has* $-p$, *but backwards, if* p *is poſitive) the line* $\text{BD} = \frac{p}{2b}$; *then raiſe the perpendicular* $\text{DC} = \frac{r}{2b^2}$, *and from* C *deſcribe a circle paſſing through the vertex* A, *meeting the parabola in* P, *ſo ſhall the ordinate* PM *be one of the roots of the cubic* $y^{3*} \pm py \pm r = 0$.

The ordinates that ſtand on the ſame ſide of the axis with the centre C are negative or affirmative, according as the laſt term r is *negative* or *affirmative*; and thoſe ordinates have always *contrary* ſigns that ſtand on *different* ſides of the *axis*. The roots are found of the ſame value, only they have contrary ſigns, when r is poſitive as when it is negative; the ſecond term of the equation being wanting.

A cubic equation, that has all its roots equal, may be conſtructed by a circle. Let the radius O B (*fig.* 15.) = R, the ſine E F = s, G H the ſine of the arc G B or 3 B E. Then, by trigonometry, $3s - \frac{4s^3}{\text{RR}} = \text{GH}$. Draw C D parallel to A B, and put S F = c, E S = x, G H = b; then $c + x = s$, whence $3 \times \overline{c + x} - \frac{4}{\text{RR}} \times \overline{c + x}|^3 = b$; and this reduced will give

$$x^3 + 3cx^2 + 3ccx + c^3 \begin{array}{l} - \frac{3}{4}\text{RR} + \frac{1}{4}b\,\text{RR} = 0. \\ - \frac{3}{4}c\,\text{RR} \end{array}$$

Suppoſe this cubic equation to be given; *viz.* $x^3 + px^2 + qx + r = 0$. Comparing this with the former, and equating the coefficients, we ſhall have $p = 3c$, and $c = \frac{1}{3}p$; alſo $q = 3cc - \frac{3}{4}\text{RR} = \frac{1}{3}pp - \frac{3}{4}\text{RR}$; whence $\text{R} = \frac{2}{3}\sqrt{pp - 3q}$, and $r = c^2 + \frac{1}{4}b\,\text{RR} - \frac{3}{4}c\,\text{RR}$, and $b = \frac{9r - pq}{pp - 3q} + \frac{2}{3}p$. Hence we obtain the following rule for the ſolution of the given equation $x^3 + px^2 + qx + r = 0$. With the radius $\frac{2}{3}\sqrt{pp - 3q}$ deſcribe the circle B G A K (*fig.* 16.) Draw the diameter A B, and C D parallel to it at the diſtance of $\frac{1}{3}p$; above it, if it be $+p$, but below it, if it be $-p$. Draw alſo Z G parallel to A B, at the diſtance $\frac{9r - pq}{pp - 3q} + \frac{2}{3}p$, above it, if it be affirmative, or below it, if negative. Let it cut the circle in G. Take the arc $\text{BP} = \frac{1}{3}\text{BG}$, and make PQ = QK = KP. From the points P, Q, K, let fall perpendiculars upon the line C D, which will be the roots of the equation; the affirmative above the line, and the negative below it. N. B. If $3q$ be greater than pp, the equation is impoſſible; for in this caſe the equation has two impoſſible roots. Alſo, if $p = 0$, then the radius of the circle $\text{OB} = \frac{2}{3}\sqrt{-3q}$, and C D coincides with A B; and the diſtance of Z G from A B is $-\frac{3r}{q}$. And if q be affirmative, the equation is impoſſible. Theſe conſtructions are eaſy: *e.g.* 1. Let $x^3 + 9x^2 - 22x - 120 = 0$. Here the radius $\text{OB} = \frac{2}{3}\sqrt{pp - 3q} = \frac{2}{3}\sqrt{81 + 66} = 8.0829$, and $\frac{1}{3}p = 3$, the diſtance of C D above A B. And $\frac{9r - pq}{pp - 3q} + \frac{2}{3}p = \frac{-1080 + 198}{81 + 66} + \frac{2}{3} \times 6 = -6 + 6 = 0$, the diſtance of G Z from A B, which therefore coincides with it; and the arc B G, and alſo its third part is 0, and P falls on B; and making PQ = QK = KP, and letting fall perpendiculars on C D, we ſhall have PS = − 3, QT = + 4, and KT = − 10, the three roots required.

E. G. 2. Suppoſe $x^3 - 17x^2 + 82x - 120 = 0$. The radius O B (*fig.* 18.) $= \frac{2}{3}\sqrt{289 - 246} = 4.37$; $\frac{1}{3}p = -5.66$, the diſtance of C D below A B, and $\frac{9r - pq}{pp - 3q} + \frac{2}{3}p = \frac{-1080 + 1394}{289 - 246} - \frac{34}{3} = 7.302 - 11.333 = -4.031$, the diſtance of G Z below A B. Take B P the third part of B G, and making PQ = QK = KP; and meaſuring the perpendiculars upon C D, we have PS = + 4, QT = + 10, and KV = + 3, the roots of the equation.

E. G. 3. Let $y^3 - 13y + 12 = 0$. In this example $p = 0$, and therefore C D (*fig.* 19.) coincides with A B; and the radius $\text{OB} = \frac{2}{3}\sqrt{-3q} = \frac{2}{3}\sqrt{39} = 4.18$; and $\frac{-3r}{q} = \frac{-36}{-13} = 2.77$, the diſtance of Z G above A B. Take the arc $\text{BP} = \frac{1}{3}$ arc B G, and make PQ = QK = KP, and let fall perpendiculars on A B; then PS = + 1, QT = + 3, and KV = − 4, will be the roots required.

If the roots of a cubic equation, $x^3 - qx + r = 0$, be poſſible, they may be found by means of a table of coſines. Let D A C (*fig.* 20.) be an angle whoſe coſine, to the radius m, is x; in A D take $AB = m$; from B, as a centre, with the radius B A, deſcribe a circle cutting A M in C, and from C, with the ſame radius, deſcribe a circle cutting A D in D; join B C, C D, and draw B K, D M, at right angles to A M, and C L at right angles to A D. Then, the triangles B A C and B C D being iſoſceles, the angles B A C and B C A are equal, as alſo C B D and C D B; and the perpendiculars B K, C L, biſect the baſes A C, B D. Alſo, the angle $DBC = BAC + BCA = 2\,BAC$; and the angle $DCM = CAD + CDA = CAD + CBD = CAD + 2\,CAD = 3\,CAD$. Let C M, the coſine of the angle D C M to the radius m, be called c; thence, from the ſimilar triangles A B K, A C L, $AB : AK :: AC : AL$, or $m : x :: 2x : \frac{2x^2}{m} = AL$; and $AL - AB = \frac{2x^2}{m} - m = BL$; hence AD, or $AL + BL = \frac{4x^2}{m} - m$. Again, $AB : AK :: AD : AM$, or $m : x :: \frac{4x^2}{m} - m : \frac{4x^3 - m^2x}{m^2} = AM$, and $AM - AC = CM = \frac{4x^3}{m^2} - 3x = c$; therefore $4x^3 - 3m^2x = m^2c$, and $4x^3 - 3m^2x - m^2c = 0$.

Let the equation $4x^3 - 3m^2x - m^2c = 0$, or $x^3 - \frac{3m^2}{4}x - \frac{m^2c}{4} = 0$, be made to coincide with the equation $x^3 - qx + r = 0$; that is, let $\frac{3m^2}{4} = q$, and $\frac{m^2c}{4} = -r$, or $m = \sqrt{\frac{4q}{3}}$, and $c = -\frac{3r}{q}$: then, from a table of coſines, find the angle whoſe coſine is $-\frac{3r}{q}$ to the radius $\sqrt{\frac{4q}{3}}$, and the coſine of one-third of this angle, to the ſame radius, is one value of x. Hence it follows, 1. That if A be the arc whoſe coſine is c, and P the whole circumference, c is alſo the coſine of $A + P$, or $A + 2P$; therefore the coſines of $\frac{A + P}{3}$, and $\frac{A + 2P}{3}$, are alſo values of x. 2. Since the radius is greater than the coſine, $\sqrt{\frac{4q}{3}}$ is greater than $-\frac{3r}{q}$, or $\frac{4q}{3}$ is greater than $\frac{9r^2}{q^2}$; that is, $\frac{q^3}{27}$ is greater than $\frac{r^2}{4}$; therefore this ſolution can only be applied when the roots of the cubic equations are poſſible.

Vieta, in his "Canonica Recenſione affectionum geometricarum," and Ghetaldus, in his "Opus poſthumum de Reſolutione et Compoſitione Mathematica," and alſo Des Cartes, in his "Geometria," have ſhewn how to conſtruct ſimple and quadratic equations. Des Cartes has alſo ſhewn how to conſtruct cubic and biquadratic equations, by the interſection of a circle and parabola; and the ſame has been done by Baker in his "Clavis Geometrica," or "Geometrical Key." (See the article BAKER.) But the genuine foundation of all their conſtructions was firſt laid and explained by Sluſius in his "Meſolabium," pars 2. This doctrine is alſo treated of by De la Hire, in a ſmall treatiſe, entitled, "La Conſtruction des Equations Analytiques," annexed to his "Conic Sections." Sir Iſaac Newton, at the end of his "Algebra," has given the conſtruction of cubic and biquadratic equations mechanically; and alſo by the conchoid and ciſſoid, as well as the conic ſections. See alſo Dr. Halley's conſtruction of cubic and biquadratic equations, and Colſon's in the Philoſophical Tranſactions; the Marquis de l'Hoſpital "Traité Analytique des Sections Coniques," lib. iv.; and Maclaurin's "Algebra," part iii. chap. 3. However, the intent of theſe geometrical conſtructions is more readily anſwered by the method of extracting roots by converging ſeries and approximation; and therefore this mode of obtaining them is very much laid aſide.

CONSTRUCTION, or *Syntax*, in *Grammar*, denotes the arranging and connecting of the words of a ſentence, according to the rules of the language. See SYNTAX.

The conſtruction is generally more ſimple, eaſy, and direct, in the modern tongues than in the ancient: we have very few of thoſe inverſions which occaſion ſo much embarraſſment and obſcurity in the Latin: our thoughts are uſually delivered in the ſame order in which the imagination conceives them: the nominative caſe, for inſtance, always precedes the verb, and the verb goes before the oblique caſes it governs.

The Greeks and Latins, M. St. Evremont obſerves, uſually end their periods, where, in good ſenſe and reaſon, they ſhould have begun them; and the elegance of their language conſiſts, in ſome meaſure, in this capricious arrangement, or rather in this tranſpoſal and diſorder of the words.

Conſtruction is either *ſimple* or *figurative*. *Simple*, is that wherein all the terms, or parts of the diſcourſe, are placed in their natural order.

Figurative conſtruction, is that wherein we recede from this ſimplicity, and uſe certain expreſſions, ſhorter, and more elegant than nature affords.

The ſyntax, or conſtruction of words, is diſtinguiſhed into two parts, *concord* and *government*, or *regimen*.

CONSTRUCTION *of deeds and wills*, in *Law*, is regulated by ſome general rules and maxims, which have been laid down by courts of juſtice. Theſe are, 1. That the conſtruction be favourable, and as near the minds and apparent intents of the parties, as the rules of law will admit. For the maxims of law are, that "verba intentioni debent inſervire;" and "benigne interpretamur chartas propter ſimplicitatem laicorum." And therefore the conſtruction muſt alſo be reaſonable, and agreeable to common underſtanding. 2. That "quoties in verbis nulla eſt ambiguitas, ibi nulla expoſitio contra verba fienda eſt;" but that where the intention is clear, too minute a ſtreſs be not laid on the ſtrict and preciſe ſignification of words; "nam qui hæret in litera, hæret in cortice." Therefore, by a grant of a remainder a reverſion may well paſs, and *è converſo*. Another maxim of law is, that "mala grammatica non vitiat chartam;" neither falſe Engliſh nor falſe Latin will deſtroy a deed. 3. That the conſtruction be made upon the entire deed, and not merely upon disjointed parts of it. "Nam ex antecedentibus et conſequentibus fit optima interpretatio." And therefore that every part of it be (if poſſible) made to take effect; and no word but what may operate in ſome ſhape or other. "Nam verba debent intelligi cum effectu, ut res magis valeat quam pereat." 4. That the deed be taken moſt ſtrongly againſt him that is the agent or contractor, and in favour of the other party. "Verba fortius accipiuntur contra proferentem." As, if tenant in fee-ſimple grants to any one an eſtate for life, generally, it ſhall be conſtrued an eſtate for the life of the grantee. 5. That, if the words will bear two ſenſes, one agreeable to, and another

other againſt law, that ſenſe be preferred which is moſt agreeable to it. As, if tenant in tail lets a leaſe to have and to hold during life generally, it ſhall be conſtrued to be a leaſe for his own life only, for that ſtands with the law; and not for the life of the leſſee, which is beyond his power to grant. 6. That, if there be in a deed two clauſes ſo totally repugnant to each other, that they cannot ſtand together, the firſt ſhall be received, and the latter rejected. In this reſpect it differs from a will; for there, of two ſuch repugnant clauſes the latter ſhall ſtand. In both caſes, however, we ſhould endeavour to reconcile them. 7. That a deviſe be moſt favourably expounded, to purſue if poſſible the will of the deviſor, who, for want of advice or learning, may have omitted the legal or proper phraſes. Hence the law often diſpenſes with the want of words in deviſes, that are abſolutely requiſite in all other inſtruments. Thus, a fee may be conveyed without words of inheritance; and an eſtate-tail without words of procreation. By a will alſo an eſtate may paſs by mere implication, without any expreſs words to direct its courſe. With regard to a will, in this reſpect, there is no diſtinction between the rules of law and of equity; for the will, being conſidered in both courts in the light of a limitation of uſes, is conſtrued in each with equal favour and benignity, and expounded rather on its own particular circumſtances, than by any general rules of poſitive law. Blackſt. Comm. b. ii. ch. 23.

Construction *of Statutes*, comprehends the following rules: 1. In the conſtruction of remedial ſtatutes there are three points which require conſideration, *viz.* the old law, the miſchief, and the remedy; that is, how the common law ſtood at the making of the act; what the miſchief was, for which the common law did not provide; and what remedy the parliament hath provided to cure this miſchief. And it is the buſineſs of the judge ſo to conſtrue the act, as to ſuppreſs the miſchief and advance the remedy. An inſtance may be ſpecified in the reſtraining ſtat. of 13 Eliz. c. 10. By the common law, eccleſiaſtical corporations might let as long leaſes as they thought proper; the miſchief was, that they let long and unreaſonable leaſes, to the impoveriſhment of their ſucceſſors: the remedy applied by the ſtatute was the making void all leaſes by eccleſiaſtical bodies for longer terms than three lives, or 21 years. In the conſtruction of this ſtatute, it is held, that leaſes, though for a longer term, if made by a biſhop, are not void during the biſhop's continuance in his ſee; or, if made by a dean and chapter, they are not void during the continuance of the dean: for the act was made for the benefit and protection of the ſucceſſor. The miſchief is, therefore, ſufficiently ſuppreſſed, by vacating them after the determination of the intereſt of the grantors; but the leaſes, during their continuance, being not within the miſchief, are not within the remedy. 2. A ſtatute, which treats of things or perſons of an inferior rank, cannot, by any *general words*, be extended to thoſe of a ſuperior. Thus, a ſtatute, treating of "deans, prebendaries, parſons, vicars, *and others having ſpiritual promotion,*" is held not to extend to biſhops, though they have ſpiritual promotion; deans being the higheſt perſons named, and biſhops being of a ſtill higher order. 3. Penal ſtatutes muſt be conſtrued ſtrictly. Thus, by the ſtatute 14 Geo. II. c. 6. ſtealing ſheep, *or other cattle*, was made felony, by benefit of clergy: but *or other cattle* being conſidered as too looſe an expreſſion for creating a capital offence, the act was held to extend to nothing but mere ſheep. In the next ſeſſions it was therefore found neceſſary to make another ſtatute, 15 Geo. II. c. 34. extending the former to bulls, cows, oxen, ſteers, bullocks, heifers, calves, and lambs, by name. 4. Statutes againſt frauds are to be liberally and beneficially expounded. 5. One part of a ſtatute muſt be ſo conſtrued by another, that the whole may (if poſſible) ſtand: "ut res magis valeat, quam pereat." As if land be veſted in the king and his heirs by act of parliament, ſaving the right of A.; and A. has at that time a leaſe of it for three years; here A. ſhall hold it for his term of three years, and afterwards it ſhall go to the king. 6. A ſaving, totally repugnant to the body of the act, is void. If, therefore, an act of parliament veſts land in the king and his heirs, ſaving the right of all perſons whomſoever; or veſts the land of A. in the king, ſaving the right of A.: in either of theſe caſes the ſaving is totally repugnant to the body of the ſtatute, and (if good) would render the ſtatute of no effect or operation; and therefore the ſaving is void, and the land veſts abſolutely in the king. 7. Where the common law and a ſtatute differ, the common law gives place to the ſtatute; and an old ſtatute gives place to a new one: and this upon a general principle of univerſal law that "leges poſteriores priores contrarias abrogant;" conſonant to which it was laid down by a law of the Twelve Tables at Rome, that "quod populus poſtremum juſſit, id jus ratum eſto." This is to be underſtood only when the latter ſtatute is couched in negative terms, or where its matter is ſo clearly repugnant, that it neceſſarily implies a negative. But if both acts be merely affirmative, and the ſubſtance ſuch that both may ſtand together, here the latter does not repeal the former, but they ſhall both have a concurrent efficacy. 8. If a ſtatute, that repeals another, is itſelf afterwards repealed, the firſt ſtatute is hereby revived, without any formal words for that purpoſe. 9. Acts of parliament, derogatory from the power of ſubſequent parliaments, bind not. 10. Acts of parliament, that are impoſſible to be performed, are of no validity; and if out of them ariſe collaterally any abſurd conſequences, manifeſtly contradictory to common reaſon, they are, with regard to thoſe collateral conſequences, void. Some have laid down this rule more largely, alleging that acts of parliament, contrary to reaſon, are void. We may further obſerve, that equity is frequently called in to aſſiſt, to moderate, and to explain poſitive laws. Nevertheleſs, our courts of equity are only converſant in matters of property. For the freedom of our conſtitution will not allow, that in criminal caſes a power ſhould be lodged in any judge, to conſtrue the law otherwiſe than according to the letter. This caution, while it admirably protects the public liberty, can never bear hard upon individuals. A man cannot ſuffer *more* puniſhment than the law aſſigns, but he may ſuffer *leſs*. The laws cannot be ſtrained by partiality to inflict a penalty beyond what the letter will warrant; but in caſes where the letter induces any apparent hardſhip, the crown has the power to pardon. Blackſt. Com. vol. i. Introd. § 3.

CONSTRUCTION Military. This term, in its general and unlimited acceptation, extends to the conſtructing of every ſort of military work. But it is commonly and peculiarly applied to the conſtruction of the different parts of the various ſyſtems of fortification that have been delivered by writers on the ſubject in different nations and languages. And to this application of it we ſhall chiefly attend.

Fear and neceſſity muſt have firſt given riſe to works of defence or fortification, of which the object originally was ſafety or ſecurity. And although there muſt have been quarrels ever ſince there have been men, we have every reaſon to ſuppoſe that the erection of works of defence, even of the ſimpleſt kind, were ſubſequent to the fiſhing and hunting ſtate of ſociety, and even in a great meaſure to that of the paſtoral.

The diſcovery of America, which exhibited men in a much ſimpler ſtate of ſociety than any that was recorded prior to that event in hiſtory, ſacred or profane, afforded no ſpecimens or traces of ſuch works among tribes who had not formed ſome ſort of villages, and become partly, at leaſt ſtationary, by paying ſome attention to agriculture. The form and ſtructure of works of defence, varied gradually with the means and the modes of attacking them. At firſt, a ſimple row of pickets, or a ditch, with that addition, was deemed ſufficient. Afterwards, in woody countries (and all countries have been more or leſs covered with woods) an enceinte or encloſure of ſolid timber was made uſe of. Sometimes the walls round towns were raiſed with beams, earth, and ſtones. This mode of erecting them appears to have prevailed among the Gauls, in the time of Julius Cæſar, who, in the 23d chapter or ſection of his ſeventh book, "De Bello Gallico," expreſſes himſelf on the ſubject in the following words.

"Muris autem omnibus Gallicis hæc fere forma eſt. Trabes directæ perpetuæ in longitudinem, paribus intervallis, diſtantes inter ſe binos pedes, in ſolo collocantur. Eæ revincuntur introrſus, et multo aggere veſtiuntur. Ea autem, quæ diximus intervalla grandibus in fronte ſaxis effarciuntur. Iis collocatis et coagmentatis, alius inſuper ordo adjicitur, ut idem illud intervallum ſervetur, neque inter ſe contingant trabes, ſed paribus intermiſſæ ſpatiis ſingulæ ſingulis ſaxis interjectis arte contineantur: ſic deinceps omne opus contexitur dum juſta muri altitudo expleatur. Hoc quum in ſpeciem varietatemque opus deforme non eſt, alternis trabibus aut ſaxis, quæ rectis lineis ſuos ordines ſervant, tum ad utilitatem et defenſionem urbium ſummam habet opportunitatem, quod et ab incendio lapis, et ab ariete materia defendit, quæ perpetuis trabibus pedes quadragenos, plerumque introrſus revincta, neque perrumpi neque diſtrahi poteſt."

In ſome parts of Ruſſia, there are even at this day towns defended by wooden walls; and in America there are ſome works, even with ſmall baſtions, compoſed entirely of wood or timber.

In countries, however, either conſiderably cleared, or not abundantly ſupplied with timber, ſtones come chiefly, and almoſt ſolely, to be made uſe of for erecting walls round their towns and cities. Theſe walls were at firſt ſimple ſtone encloſures, of a ſufficient height to prevent ſurpriſes, and thickneſs at top for three or four men to walk a-breaſt. But having no flanking defences, they occaſioned dead or unſeen parts throughout their whole extent; by which means the aſſailants, as ſoon as they got near the foot of them, were almoſt as much ſcreened or covered from the view of thoſe who defended them, as they on the other hand were from theirs. To remedy this inconvenience and defect, openings were made on the top of ſuch a wall, and loopholes. This contrivance, however, did not afford a complete remedy, or entirely remove the defect. For the oppoſite ſides of every adjacent two of theſe openings and loopholes, which were wider within than without, produced, formed with the front of the wall a triangular ſpace, that could not be ſeen or commanded from them. To remove this defect, ſquare towers were added to the wall at diſtances from one another, ſuited to the miſſile weapons then in uſe, with one face of each looking towards the field. This mode, however, of encloſing towns, was ſtill found to be imperfect and defective, as the face of each of thoſe towers that fronted the field, could not be ſeen from any other part, and of courſe could not be defended. Round towers were therefore introduced inſtead of them, as creating fewer dead parts, and as being better calculated for reſiſting battering engines. This method was practiſed a long time, and would, in all human probability, have continued in uſe had it not been for the invention of gun-powder, which changed the mode of attacking places, and of courſe rendered alterations in that of defending them neceſſary. Even after the application of that powerful and inflammable ſubſtance to military purpoſes, bulwarks, or large baſtions, of a round form, continued for a long time in uſe. Moſt of theſe have been either taken down, or changed into angular ones. But ſeveral ſtill remain, and are to be ſeen in different parts of Europe.

The inteſtine wars which harraſſed Italy for a length of time, taught the Italians experience in war, and the neceſſity of attending to every thing that contributed to improve the art of defence. They were accordingly the firſt people in Europe who fixed the idea of modern fortification, and reduced it to a ſort of ſyſtem. Unaccuſtomed then, however, to the effects of ſhells, and a numerous artillery, they confined their improvements chiefly to the covering of two guns in each flank, for diſputing the paſſage of the ditch.

The war, which afterwards broke out in the Low Countries, and continued during eighty years with an extraordinary degree of valour and obſtinacy, and a deſtruction of the human race, of which there are but few examples, contributed a good deal to the advancement of this ſcience. The Dutch, who alone, and unſupported, had to oppoſe for a long time the whole preſſure of a power ſo formidable as that of Spain then was, made great progreſs in the attack and defence of places. And it is from that time that we ought to date the epoch of the ſuperiority which the former of theſe has acquired over the latter.

The following is Errard's method of conſtruction. He fortifies inwards; and his line of defence is raſant in all figures. He makes his flank from the ſquare, up to the octagon, incluſive, perpendicular to the face of the baſtion. But, in all other polygons, he makes it perpendicular to the curtain.

The flanked angle, or ſaliant angle of the baſtion, is, in the ſquare, equal to ſixty degrees, in the pentagon, to eighty, and in all other polygons, to ninety degrees.

For inſtance, let AB (*Plate* V. *Fortification, fig.* 1.) be the ſide of a hexagon, of which O is the centre. Draw the radii A O, B O, at the extremities A, B, of the exterior ſide A B, make the angles O A F, O B E, each equal to forty-five degrees. From the points A, B, draw right lines A E, B F, biſecting theſe angles, and meeting B E, A F, in the points E, F. Then theſe laſt-mentioned points E, F, will be the terminations of the curtain E F, of the lines of defence A F, B E, and of the flanks E C, F D, which in all figures, up to the octagon incluſive, are by this conſtruction perpendicular to A F, B E, the lines of defence, but in all other polygons to E F, the curtain. If the ſame conſtruction be made on each of the other ſides of the hexagon, it will be fortified. And if from C, D, the angles of the epaules or ſhoulders, right lines be drawn parallel to the raſant lines, or lines of defence A F, B E, we get the counterſcarp of the ditch. On the inſide he makes a rampart equal in breadth to the length of one of the flanks.

Since the line A B, in the preceding figure, is ſuppoſed to repreſent the ſide of a regular hexagon inſcribed in a circle, the angle A O B of the centre is equal to 60 degrees, the angle A B K of the polygon is equal to 120 degrees; the flanked angles, or angles of the baſtions L A C,

D L M.

D B M, are each of them equal to a right one, or 90 degrees. The angles of the epaules or ſhoulders A C E, B D F, are alſo each of them equal to a right angle. The angle *diminué* A F G, or B E H, or the angle A B E, or B A F, formed by the exterior ſide, and either line of defence being equal to the difference between 60 and 45 degrees, is of courſe equal to 15 degrees. The angle C E F, or D F E of the flank, is equal to 75 degrees, and the flanking angle C N D, is equal to 150 degrees. But ſince the angle C A E, which is half the flanked angle, or angle of the baſtion, is equal to 45 degrees, and is by conſtruction biſected by the right line A E, each of the angles C A E, E A G is equal to 22° 30′. And the angle A E C, the complement of C A E to 90°, is conſequently equal to 67° 30′. The angle A E G is therefore equal to 37° 30′, the angle A E F to 142° 30′; the angle A G F to 120 degrees, and the angle E A B to 37° 30′. Alſo the angle A E B is equal to 127° 30′.

Thus then all the neceſſary angles are known for calculating the different parts of the conſtruction. For the exterior ſide A B being given, the line of defence A F or B E is eaſily found by means of the triangle A F B, or the triangle A E B, by the following analogies.

As the ſine of the angle A F B
Is to the ſine of the angle A B F,
So is the ſide A B
To the ſide A F.
As the ſine of the angle A E B
Is to the ſine of the angle B A E,
So is the exterior ſide A B
To the line of defence B E.

And the right line A E, or its equal B F, is found by the following analogy.

As the ſine of the angle A E B
Is to the ſine of the angle A B E,
So is the exterior ſide A B
To the right line A E or B F.

And as the angle A C E is a right one, we get the face A C of the baſtion, and the flank C E, by means of A E, and the following analogies.

As radius
Is to the ſine of the angle A E C,
So is the right line A E, or its equal B F,
To A C, the face of the baſtion, or its equal B D.
And,
As radius
Is to the ſine of the angle C A E,
So is the right line A E, or its equal B F,
To the flank C E, or its equal D F.

The perpendicular to the exterior ſide A B, or the rectilinear diſtance from the middle of it, to the point N, the interſection of the raſant lines, or lines of defence, is determined by this analogy.

As radius
Is to the tangent of the angle B A N, or A B N,
So is half the exterior A B
To the perpendicular diſtance from the middle thereof, to the point N.

By means of the flank, the curtain is found by the following analogy.

As radius
Is to the ſecant of the angle C E F, or D F E,
So is the flank C E, or D F,
To the curtain E F.

And the capital A G of the baſtion is found by this analogy.

As the ſine of the angle A G E
Is to the ſine of the angle A E G,
So is the right line A E
To the capital A G of the baſtion.

In like manner, the demi-gorge E G, or F H, is found by the following analogy.

As the ſine of the angle A G E
Is to the ſine of the angle E A G,
So is the right line A E, or its equal B F.
To the demi-gorge G E, or its equal F H.

The calculation of theſe different parts will be ſimilar when the flank is perpendicular to the curtain, inſtead of the lines of defence as in polygons above an octagon, which is effected by taking the right lines N C, N D, equal, reſpectively, to the lines N E, N F. The flanks then are longer and better.

This author aſſigns no reaſon drawn either from the nature of the polygons, or their capability of being embraced or defended for the length of his perpendicular or the magnitude of the angle formed by an exterior ſide, and a line of defence. And, as in all polygons, from the hexagon upwards, the flanked angle or ſaliant angle of the baſtion, is the ſame, or equal to 90 degrees; his conſtruction in all polygons, above an octagon, gives this perpendicular or angle much greater than it ought to be. Thus, in a decagon, it gives this angle equal to $\frac{180^\circ - \frac{360^\circ}{10} - 90^\circ}{2} = 27^\circ$; whereas, it ought but very little to exceed $22\frac{1}{2}^\circ$.

In a dodecagon is given this angle $= \frac{180^\circ - \frac{360^\circ}{12} - 90^\circ}{2} = 30^\circ$. ; whereas it ought only to be about 24°. And this conſtruction on part of a right line, which may be regarded as a polygon of an infinite or rather indefinite number of ſides, gives this angle equal to 45 degrees, and the flanking angles formed by the interſections of the lines of defence, equal each to 90 degrees. The lines of defence in this caſe exactly correſpond with Montalambert's conſtruction in his "Fortification Perpendiculaire."

As in this conſtruction the angle *diminué*, or the angle formed by an exterior ſide and a line of defence increaſes faſt in magnitude, as the number of the ſides of the polygon increaſe, being in the dodecagon twice as great as it is in the hexagon, the lengths of the curtains decreaſe and the faces of the baſtions increaſe greatly beyond their juſt proportions, which is a material defect; ſince the faces, which are the weakeſt parts, being defended reſpectively, only on one ſide by a ſingle flank, are thereby augmented, and the curtains, which are the ſtrongeſt, being defended each on both ſides, or by two flanks, are diminiſhed.

His mode of placing the flanks in figures up to the octagon incluſive at right angles to the lines of defence, and in other polygons perpendicular to the curtains, though it certainly ſecures them well againſt the enemies' batteries, and renders them fit for defending the gates and curtains, (which, however, by their nearneſs to the flanks, are naturally beſt ſecured), does not enable them to diſcover the enemies' batteries ſufficiently to defend the counterſcarp, and prevent them from advancing their works to it, a circumſtance which affords great advantage to the beſiegers. And if orillons be made in flanks, ſo placed, the covered flanks would be ſo hid, that they could ſcarcely ſee the ditch throughout its whole width, and the merlons from their angles towards the field being very acute, would eaſily be ruined by the enemies' batteries and rendered uſeleſs. Flanks ought to be placed perpendicularly, or at leaſt very nearly ſo to the lines of defence. For when an enemy once makes a lodgment on the counterſcarp, he will diſcover them whether they be ſo placed or not. And if flanks be diſcovered, they alſo diſcover, and being either reveted or demi-reveted and formed of earth that is well ſettled, they are by no means ſo eaſily ruined as the batteries of the beſiegers, which are formed of gabions and newly raiſed earth.

Count Pagan's method of conſtruction on a polygon, (*fig.* 2.) is widely different from that of Errard, and alſo much preferable. For inſtead of making the angle of the flank acute in the octagon and figures of a ſmaller number of ſides, and only equal to a right one in any polygon of a greater number of ſides, as Errard does, he makes it obtuſe and places his flanks perpendicularly to the lines of defence, in order that they may diſcover more ground, and the better raſe and defend the faces of the baſtions, which are the moſt ſaliant and weakeſt parts of the body of the place and are firſt attacked, breaches being commonly made in them. This ingenious author makes his lines of defence like Errard's, always raſant, but does not like him make 90 degrees the maximum of his flanked angle, or angle of his baſtion.

He delivers conſtructions for three ſorts of fortifications, namely, the great, the mean, and the little. He fortifies or conſtructs inwards, and in the great fortification makes the exterior ſide equal to 200 toiſes, in the mean equal to 180 toiſes, and in the little equal to 160 toiſes. He allows 60 toiſes to each face of a baſtion in the great, 55 in the mean, and 50 in the little, in all figures above a ſquare. He makes the perpendicular to the exterior ſide in the great fortification in all figures, except the ſquare where it is 27 toiſes, equal to 30 toiſes; in the mean equal to 24 toiſes; and in the little equal to 21.

The dimenſions of theſe principal lines in theſe three kinds of fortification, are contained in the following Table.

	Great Fortification.		*Mean.*		*Little.*	
	Square.	In all other Polygons.	Square.	In all other Polygons.	Square.	In all other Polygons.
Exterior Sides.	200	200	180	180	160	160
Perpendiculars.	27	30	24	30	21	30
Facesofbaſtions	60	60	55	55	45	50

Suppoſing then the exterior ſide A B, (ſee the figure,) equal to 200 toiſes in the great, to 180 in the mean, and to 160 in the little, biſect it in the point C. In C O, which is perpendicular to A B, take C D equal to 30 toiſes, in all regular figures of a greater number of ſides than four. Through the point D, draw the lines of defence A D H, B D G, on which take A E and B F, each equal to 60 toiſes in the great fortification, to 55 in the mean, and to 50 in the little. Then draw the flanks E G, F H, perpendicularly to the raſant lines or lines of defence B G, A H, and form the curtain by joining the points G, H. This is Count Pagan's conſtruction, without orillons and retired flanks.

The figure is a regular hexagon, ſuppoſed to have each of its ſides equal to 180 toiſes, as in his mean fortification. The angle A O B of the centre is therefore equal to 60 degrees, and the angle of the polygon to 120. A C, or B C, is equal to 90 toiſes, the perpendicular C D is equal to 30, and the face A E, or B F, to 55 by conſtruction.

Now by means of theſe lines and angles, the others are eaſily found. And in the firſt place, the angle *diminué* C A D, or the angle formed by the exterior ſide A B, and the line of defence A H, is formed by the following analogy.

As A C, equal to 90 toiſes,
Is to C D, equal to 30 toiſes,
So is radius
To the tangent of the angle $C A D = 18° 26' 6''$ very nearly. If this angle be taken from 60 degrees, half the angle of the polygon, we get the angle O A H, or M A E, equal to $41° 33' 54''$. But this is equal to half the ſaliant angle of the baſtion, wherefore the whole flanked angle or angle of the baſtion is equal to $83° 7' 48''$. And the flanking angle A D B, being equal to the exceſs of 180 degrees above twice the angle *diminué*, is evidently equal to $143° 7' 48''$.

The tenaille A D, being equal to $\sqrt{\overline{AC}^2 + \overline{CD}^2}$, is $= \sqrt{9000} = 10\sqrt{90} = 94.868329805$ nearly. Or it is found by this analogy.

As radius
Is to the ſecant of the angle *diminué* C A D,
So is A C, half the exterior ſide A B,
To the tenaille A D.

If from this there be taken the face A E, which is equal by conſtruction to 55 toiſes, we get the right line D E, and the following analogy for the flank E G.

As radius
Is to the ſine of double the angle *diminué* C A D,
So is the right line D E
To the flank E G.

And as the angle A E G of the epaule or ſhoulder is always, in regular conſtruction, equal to twice the angle *diminué* C A D, and the angle E G B formed by the flank and line of defence, the angle D E G is known, and D G is aſcertained by the following analogy.

As radius
Is to the ſine of the angle D E G,
So is the right line D E
To the right line D G.

The angle E G H of the flank, is in this conſtruction equal to 90 degrees, together with the angle *diminué*, or the angle formed by the exterior ſide, and one of the lines of defence.

The complement, D G, or D H, being thus found, the curtain G H is aſcertained by the following analogy.

As the ſine of the angle *diminué* D G H
Is to the ſine of double the ſaid angle,
So is the complement D G
To the curtain G H.

The lengthened curtain M H, or G N, is determined by the following analogy.

As the ſine of half the angle of the polygon
Is to the ſine of half the flanked angle,
So is the raſant line, or line of defence A H,
To the lengthened curtain M H. From which, and the curtain G H, the inward or interior ſide M N is immediately obtained.

And the capital A M is aſcertained by this analogy.

As the ſine of half the angle of the polygon
Is to the ſine of the angle *diminué*,
So is the raſant line, or line of defence A H,
To the capital A M of the baſtion.

It is manifeſt from the foregoing table, that the perpendicular in this learned and judicious author's great fortification, ſubtends in the ſquare an angle of about $15° 6' 34''$ nearly, and in all other regular figures of about $16° 41' 57''$ nearly; that in his mean fortification it ſubtends in the ſquare an angle of about 14° 55′ 53″, and in all other regular figures an angle of about 18° 26′ 6′; and that in his little fortification, it ſubtends in the ſquare an angle of about 14° 42′ 30″, and in all other regular figures an angle of about 20° 33′ 22″.

For his caſemates or retired batteries and orillons, he biſects his flanks, leaving one-half of each adjoining the epaule or ſhoulder for its orillon. The firſt flank or battery on the other half is retired five toiſes behind the orillon, and is two toiſes above the level of the ditch; the ſecond is retired ſeven toiſes within the firſt, and is four toiſes above the level of the ditch; and the third is retired ſeven toiſes behind the ſecond, and is ſix toiſes above the level of the ditch, being as high as the rampart, which is three toiſes above the level of the field, or terre-plain of the place, as the bottom of the ditch is three toiſes below it. Theſe are formed by continuing the lines of defence into the baſtions, and drawing lines parallel to theſe continuations from the points biſecting the flanks.

He makes within each of his baſtions a ſort of ſmaller baſtion, or a cavalier in the form of one, having its faces parallel to thoſe of the baſtion and 13 toiſes diſtant from them, which ſerves as a retrenchment. The great ditch is 16 toiſes wide, and its counterſcarp is parallel to the faces of the baſtions or to the lines of defence. The capital of each of the ravelins, which he places on the re-entering angles of the counterſcarp in ſuch a manner as to be defended by the faces of the baſtions and the counter-guards before them, is equal to 50 toiſes, and its faces are drawn to the ſhoulders. The demi-gorges of the redoubt within the ravelin are each equal to 15 toiſes, and the faces of it are parallel to thoſe of the ravelin itſelf. The ditch of the ravelin is 12 toiſes wide, and that of the redoubt 6. The ſaliant angle of each counter-guard is 40 toiſes diſtant from that of the baſtion which it covers, and this work is from 9 to 10 toiſes broad at its extremities. The ditch before it is 12 toiſes wide. The covert-way is 4 toiſes wide, and the faces of the places of arms are each 8 toiſes long, and parallel to the oppoſite counterſcarp.

The flanks, curtain, and other lines in this conſtruction found above by means of ſines, tangents, and ſecants, may be aſcertained without any logarithmic table, in the following manner.

Since the tenaille A D is $= 10\sqrt{90}$ toiſes $= 30\sqrt{10}$ toiſes, and A C is $= 90$ toiſes by hypotheſis, and C D is $= 30$ toiſes, by conſtruction, or $= \frac{AC}{3}$, we have $AD : AC :: \sqrt{10} : 3$, and $AD : CD :: \sqrt{10} : 1$. But $AD : AC :: AE$ (55 toiſes by conſtruction) : the exceſs of A C above one half of E F, which exceſs is therefore equal to $\frac{3 \times 55}{\sqrt{10}}$ toiſes, and its double, which is the exceſs of A B above E F, is of courſe equal to $\frac{330}{\sqrt{10}}$ toiſes, or to $33\sqrt{10}$ toiſes; conſequently E F is equal to $180 - 33\sqrt{10}$ toiſes; but $AD : CD :: EF : FH$, and $AD : AC :: EF : EH$; wherefore the flank F H is equal to $\frac{180-33\sqrt{10}}{\sqrt{10}}$ toiſes $= 18\sqrt{10}-33$ toiſes; and E H is equal to $\frac{540-99\sqrt{10}}{\sqrt{10}}$ toiſes $= 54\sqrt{10}-99$ toiſes. And ſince E D is $= AD - AE = 30\sqrt{10} - 55$ toiſes; we get D H equal to $24\sqrt{10} - 44$ toiſes. But $AD : AB :: DH : GH$, which is therefore equal to $\frac{24\sqrt{10}-44}{\sqrt{10}} \times 6$ toiſes $= \frac{144\sqrt{10}-264}{\sqrt{10}}$ toiſes; and D I, which is equal to a ſixth part of G H is equal to $\frac{24\sqrt{10}-44}{\sqrt{10}}$ toiſes. Conſequently C I is equal to $\frac{54\sqrt{10}-44}{\sqrt{10}}$ toiſes. And $OC : CI :: OA$: the capital A M of the baſtion. Count Pagan's flank, in his mean fortification, being to the perpendicular, as $18\sqrt{10}-33$ to 30, is upwards of 5 toiſes leſs than it, which is certainly too great a difference.

This learned and judicious author, whom the principal fortifiers ſince his time, particularly Vauban, have very much followed, conſidering that the flanks, ramparts, and ditches, were the works that contributed moſt powerfully towards the defence of the body of a place, and the retarding of the approaches of an enemy to it, made the demi-gorges of his baſtions large, in order to have three flanks or batteries on each of them, ſufficiently long for placing four pieces of cannon in, reſpectively. Three of theſe, in each of the ſaid three flanks, are, by his conſtruction, ſo well covered from the counter-batteries of the beſiegers, that they cannot eaſily be damaged by them. And the beſiegers, on approaching the breaches, and attempting to make lodgments in the ruins of them, muſt ſuffer greatly from the guns ſo covered in theſe retired flanks, as they are then fired on by them, de revers, or in the rear.

Though his diviſion of fortification, into great, mean, and little, ſeems not to be of much uſe, or moment, he muſt certainly be allowed to be the firſt writer on the ſubject that gave the true poſition to his flanks, making them perpendicular to the lines of defence. His mean fortification appears to be preferable to the great, as it does not make the lines of defence too long for muſquet-ſhot. The poſition of the flanks, and great length, he gives to the faces of his baſtions, render his demi-gorges long enough to afford a ſufficiency of room for his retired flanks.

The two ditches, with the two ramparts, that he makes, are well calculated for obſtructing and retarding the enemies' paſſage of the ditch, for depriving them of the uſe of fourneaux, and for preventing them from lodging themſelves on the ruins of the breaches. For when the beſiegers have even paſſed the main ditch, and taken the firſt rampart, they will find themſelves expoſed in the ſecond ditch to the beſieged's fire on all ſides, and liable to be deſtroyed by ſhells, handgrenades, fourneaux, mines, &c.

By giving one-half of his flank to the orillon, he covers his retired batteries extremely well. The ditch is very well defended from the flanks, which being perpendicular to the lines of defence, look fully along the faces of the oppoſite baſtions.

It muſt be obſerved, however, that though the poſition of his flanks be good, they are too ſmall, particularly in polygons of a conſiderable number of ſides, being a good deal ſhorter than the perpendiculars to the exterior ſides; whereas they ſhould be equal, or nearly equal to them, as perpendiculars to the exterior ſides of polygons were firſt introduced into conſtruction for the ſole purpoſe of obtaining flanking defences. This is in a great meaſure occaſioned by his making the faces of his baſtions too long, which he was probably led to do from a deſire of obtaining three retired batteries in each flank. The face of the baſtion is equal to the $\frac{11}{35}$th part of the exterior ſide, whereas it may with confidence be aſſerted, that it ought not to exceed a fourth. For the faces of the baſtions are moſt ſaliant, and conſequently the tendereſt part of the body of the place. They are always firſt attacked, and in them the breaches are conſtantly made. But when they are very long, the beſiegers can make large breaches in them, which is a great advantage to them, and a no leſs diſadvantage to the beſieged.

The retrenched baſtion, or redoubt in form of one within the baſtion, muſt increaſe the expence at leaſt one-third. The ditch before it is but ill defended, as there are no tenailles for that purpoſe. And as it is hollow or empty, it may be taken as eaſily as the main baſtion, by means of a ſecond mine, and thereby occaſion the loſs of the place, eſpecially as no retrenchment can be raiſed within it to enable the beſieged to capitulate with more advantage.

His retired flanks, or batteries, appear to be too near to one another, being only ſeven toiſes diſtant from outline to outline.

He makes no traverſes. But this cannot be imputed to him as either an overſight or fault, as firing *en ricochet* was not known in his time. By giving the ſame length of perpendicular to the exterior ſides of all figures of a greater number of ſides than four, he makes the flanked angle, or angle of the baſtion in a polygon of a conſiderable number of ſides, very obtuſe. This angle begins to become obtuſe in the hexagon, and by his conſtruction on part of a right line, it is no leſs an angle than one of $143^\circ\ 7'\ 48''$.

He aſſigns no reaſon whatſoever for the length of his perpendicular, derived from the properties of different polygons, or their relative degree of importance and capability of defence, nor for his giving the ſame perpendicular in all regular figures of a greater number of ſides than four. His perpendiculars are mere arbitrary aſſumptions, like thoſe of all other authors, who have written on fortification ſince his time. The truth however is, that every regular figure has a perpendicular of its own, which is different from that of any other, of a preciſe and determinate length, and bearing a given ratio to the exterior ſide.

Mr. Blondel's method of conſtruction is as follows:

Like Count Pagan he fortifies inwards, but inſtead of the perpendicular he begins with the angle *diminué*, or the angle formed by an exterior ſide, and a line of defence. This angle he determines by taking a right angle, or 90 degrees from the angle of the polygon, and adding 15 degrees to a third part of the remainder. Thus, if n denote the number of the ſides of a regular figure, the angle of the polygon, or the angle contained by two of its ſides, will be equal to $180^\circ - \frac{360^\circ}{n}$, and his angle *diminué* will of courſe be equal to $30^\circ - \frac{120^\circ}{n} + 15^\circ$ or $45^\circ - \frac{120^\circ}{n}$, which gives 15° for it in the ſquare, 21° in the pentagon, 25° in a hexagon, and in his conſtruction on part of a right line 45°, which then makes the perpendicular equal to half the exterior ſide. This expreſſion for his angle *diminué*, as is evident by inſpection, is always equal to the exceſs of 45° above 120° divided by the number of the ſides of the figure; wherefore it is always found without any reference whatſoever to the angle of the polygon, by dividing 120° by the number of the ſides of the figure, and ſubtracting the quotient from 45°. And ſince the angle of the centre, or the angle ſubtended by one of the ſides of the figure, is equal to $\frac{360^\circ}{n}$, this angle *diminué* is had by taking from 45 degrees a third part of the angle of the centre.

His angle *diminué* gives the angle of the baſtion, or flanked angle, in a ſquare equal to 60 degrees, in a pentagon equal to 66 degrees, in a hexagon equal to 70 degrees, and in a conſtruction on part of a right line equal to 90 degrees.

The flanking angle, or the angle formed by the lines of defence, is in the ſquare, equal to 150 degrees, in the pentagon, to 138, in the hexagon, to 130, and in a conſtruction on part of a right line, to 90 degrees.

He ſuppoſes two ſorts of fortification, *viz.* the great, in which he makes the exterior ſide equal to 200 toiſes in all polygons; his line of defence equal to ſeven tenths of the exterior ſide, or 140 toiſes; and the face of his baſtion equal to half the tenaille, or line between a flanked angle and the interſection of the lines of defence; and the little, in which he makes the exterior ſide in every figure equal to 170 toiſes, the line of defence equal to ſeven tenths of this, or to 119 or 120 toiſes, and the face of the baſtion equal to half the tenaille, his conſtruction in both being the ſame.

Thus for inſtance, let A B (*fig.* 3.) be the ſide of a hexagon. At its extremities A, B, make the angles *diminué* A B G, B A G, each equal to 25 degrees, the exceſs of 45 degrees above a third part of A M B the angle of the centre. On A G, B G produced take A F, B E for the lines of defence, each equal to ſeven tenths of A B the exterior ſide. Biſect the tenailles A G, B G, in the points C, D, to get the faces A C, B D, draw the flanks C E, D F, and form the curtain by drawing E F.

Mr. Blondel takes on each flank 10 toiſes for his ſquare orillon, employing the reſt of it as a covered flank, which he keeps retired five or ſix toiſes inwards, as high as the heptagon; on higher polygons from 10 to 12 toiſes, in order to lengthen the curtains; and to obtain curtains in conſtructions, which being made on a ſtraight line, or very high polygons, have none, or very ſhort ones, he retires his flank as much as 20 toiſes, that he may have a curtain upwards of 20 toiſes long. For by his conſtruction on a right line, where the angle *diminué* is 45 degrees, the tenaille is upwards of ſeven tenths of the exterior ſide. The retirade of the flank is meaſured on a right line, drawn from the angle of the oppoſite baſtion, to the point terminating the ten toiſes, ſet off from the epaule on the flank for the orillon. Like Count Pagan, he makes three retired batteries in each flank within the caſemate, allowing three toiſes for the breadth of the parapet in each, and five for its platform, or eight toiſes from the outline of one battery to that of another. The loweſt of theſe retired flanks is from nine to twelve feet above the bottom of the ditch, the ſecond from 18 to 24, and the third, or higheſt, from 27 to 36 feet, being level with the rampart. Theſe three flanks are terminated towards the demi-gorge upon the line of defence produced, and towards the orillon, on the line drawn from the angle of the oppoſite baſtion, through the end of the ſame orillon. The parapet of the loweſt flank is nine or ten feet high, that of the middle one ſix or ſeven, and that of the third, or higheſt one, $3\frac{1}{2}$. Thoſe of the loweſt, and middle one, muſt of courſe have embraſures in them.

As there is a great deal of ſpace between the two high flanks in each baſtion, he makes a cavalier in it, having its faces parallel to the flanks, and each of them capable of holding twelve pieces of cannon at leaſt. Theſe cavaliers and retired flanks muſt be made with the earth taken from the great ditch, of which the width is equal to the length of one of the flanks. The re-entering angle of the counterſcarp is therefore oppoſite to and nearly about the middle of the exterior ſide.

This author places a counter-guard in front of each baſtion, with its faces parallel to thoſe of the ſame compoſed entirely of maſonry without any earth, and every where countermined. Its breadth or thickneſs is only from 3 to 4 toiſes, including its parapet, which is from 8 to 10 feet thick. It is erected in the great ditch 10 or 12 toiſes diſtant from the counterſcarp, which diſtance therefrom forms its ditch. The principal object in erecting this counter-guard is to conceal from the enemies' view the low flanks oppoſite to it, whilſt its narrowneſs or ſmall breadth puts it out of his power to place his guns in after he has taken it.

The ſaliant angle of his ravelin is determined by the interſection of two arcs, deſcribed from the ſhoulders of the two adjoining baſtions, with a radius equal to the diſtance between them. Its faces produced meet thoſe of the baſtions about 6 toiſes from the ſhoulders and are bounded on the lines or faces of the counter-guards produced, which alſo determine the gorge of the ravelin.

The ditch of the ravelin is from 10 to 12 toiſes broad, and that it may be the better defended, Mr. Blondel takes, in the face of the baſtion, a ſpace equal to this breadth, commencing ſix toiſes from the ſhoulder, in which he makes a low battery of 4 or 5 feet high, and another on the inſide of the ſame height with the parapet of the place, and retired about 7 toiſes within the face.

The ditch before the counter-guards is 10 toiſes broad. The ravelin not only covers the ſhoulders and the oillons of each baſtion, but likewiſe defends the ditch of the counter-guard, as he takes as much of its face as is ſufficient for ſeeing or diſcovering all that to make two batteries in, *viz.* a low one and a high one in the ſame manner as he does in the faces of the baſtions. He allows no more terre-plain in the ravelin, than what is juſt enough for the recoiling of his guns, leaving all the reſt of its inſide empty for the purpoſe of being able eaſily to countermine the rampart, and to prevent the enemy from making a lodgment in it, after he may have forced it.

The better to cover the batteries in the face of each baſtion, which defend the ditch of the ravelin, he adds in the angles of the counterſcarp of the ravelin *lunettes,* in the form of lozenges, allowing 20 toiſes for the ſemi-gorge in each. Theſe have their faces parallel to the counterſcarps of the ditches before the ravelin and counter-guard, and the ditch before them 8 toiſes broad.

The author likewiſe makes a *lunette* in his great ditch from 7 to 8 toiſes broad, which he carries quite round the work to prevent the low flanks, which would be otherwiſe eaſily acceſſible, from being got at. A ſmaller or narrower *lunette* might alſo be made in the ditches of the outworks, particularly when there are batteries in the demi-lunes or ravelins.

The calculations for the angles and lines of a conſtruction on the ſides of a polygon, according to Mr. Blondel's method, are made in the following manner.

Since the figure referred to is a hexagon, the angle of the centre is equal to 60 degrees, the angle of the polygon to 120, and the angle *diminué*, B A F or A B E, to 25 degrees. The flanking-angle, A G B, is 130 degrees, and the flanked angle, N A G, or D B S, is equal to 70 degrees. Wherefore half the flanked angle, E B O, or F A P, is equal to 35 degrees.

The tenaille A G, and of courſe the face A C of the baſtion, is found by the following analogy.

As the ſine of the angle A G B
Is to the ſine of the angle A B G,
So is the exterior ſide A B
To the tenaille A G, of which the face A C is one-half.

From the line of defence A F, which is ſeven-tenths of the exterior ſide A B, we get the complement G F or G E, and the curtain E F of courſe by this analogy.

As the ſine of the angle E F G
Is to the ſine of the angle E G F,
So is the complement E G
To the curtain E F.

And as the ſum of the angles C E F, E C F, is equal to 180°—the angle *diminué* C F E (25°) = 155°, and C F, E F, are known, we have this analogy.

As the ſum of the ſides C F, E F
Is to their difference,
So is the tangent of 77° 30′, half the ſum of the angles,
To the tangent of half their difference.

Half this difference added to half the ſum, gives C E F the angle of the flank, and taken from half the ſum gives E C F the ſupplement of A C E the angle of the *epaule* or ſhoulder.

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Is to the ſine of the angle *diminué* C F E,
So is C F
To the flank C E.

The demi-gorge E P is determined by firſt finding the lengthened curtain F P by this analogy.

As the ſine of the angle A P F, which is known,
Is to the ſine of the angle F A P which is alſo known,
So is the line of defence A F = $\frac{7}{10}$ of A B
To the lengthened curtain F P.

Then from F P ſo found take the curtain E F, and there will remain the demi-gorge E P.

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Square 4 ſides.	90°	90°	45°	60°	30°	15°	150°	30°	120°	60°	122° 47′	107° 47′	120°
Pentagon 5	72°	108°	54°	66°	33°	21°	138°	42°	132°	48°	123° 11′	10[illegible]° 41′	105°
Hexagon 6	60°	120°	60°	70°	35°	25°	130°	50°	140°	40°	123° 48′	97° 48′	95°
Heptagon 7	51° 25′	128° 35′	64° 17½′	72° 51′	36° 25½′	27° 52′	124° 16′	55° 44′	145° 44′	34° 16′	124° 15′	96° 23′	87° 51′
Octagon 8	45°	135°	67° 30′	75°	37° 30′	30°	120°	60°	150°	30°	125° 4′	95° 4′	82° 30′
Enneagon 9	40°	140°	70°	76° 40′	38° 20′	31° 40′	116° 40′	63° 20′	153° 20′	26° 40′	125° 20′	94° 40′	78° 20′
Decagon 10	36°	144°	72°	78°	39°	33°	114°	66°	156°	24°	126° 54′	93° 54′	75°
Endecagon 11	32° 44′	147° 16′	73° 38′	79° 6′	39° 33′	34° 5′	111° 50′	68° 10′	158° 10′	21° 50′	127° 42′	93° 37′	72° 17′
Dodecagon 12	30°	150°	75°	80°	40°	35°	110°	70°	160°	20°	128° 28′	93° 28′	70°
Right line.	0	180	90°	90°	45°	45°	90°	90°	180°	0	135	90°	45°

tant from the counterſcarp, which diſtance therefrom forms its ditch. The principal object in erecting this counter-guard is to conceal from the enemies' view the low flanks oppoſite to it, whilſt its narrowneſs or ſmall breadth puts it out of his power to place his guns in after he has taken it.

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Is to the ſine of the angle F A P which is alſo known,
So is the line of defence A F = $\frac{7}{10}$ of A B
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Dodecagon 12	30°	150°	75°	80°	40°	35°	110°	70°	160°	20°	128° 28′	93° 28′	70°
Right line.	0	180°	90°	90°	45°	45°	90°	90°	180°	0	135°	90°	45°

TABLE of the Lines of the different Parts of the Conſtruction according to Mr. BLONDEL's Method.

Lines.	A B Exterior ſide.	O P Interior ſide.	A F Line of Defence.	B G Tenaille.	B D Face.	F D Flank.	E F Curtain.	F O Demi-gorge.	B O Capital.	B M Semi-diameter major.	O M. Semi-diameter minor.	F K	B K	G K	G F	E O
Square 4 ſides	200 170	127½ 109	140 120	103½ 88	51½ 44	27 23	70½ 60½	28½ 24½	52 44½	141½ 120	89⅛ 75½	23 19½	60 51	59½ 50½	36½ 31	99 87
Pentagon 5	200 170	129½ 111	140 120	107 90½	53½ 45	36½ 31	60½ 52	33½ 29	62 53	170 144½	108 91½	28 24	74 62½	61 52	33 28	96 82
Hexagon 6	200 170	132 113	140 120	110 94	55 47	42½ 35	54 46	39 32	68½ 58½	200 170	131½ 111½	34 29½	86 72	63½ 54½	29½ 25	93 80
Heptagon 7	200 170	137 117½	140 120	113 96	56 48	47½ 41	48 41	44½ 38	72½ 62	230½ 196	158 134	38½ 33	93½ 79½	65½ 56	27 23	92½ 79½
Octagon 8	200 170	142½ 122	140 120	115½ 98	58 49	50½ 43	41½ 35½	50½ 43	75½ 64½	261½ 222	186 157½	47 40	101 87	71½ 60½	24½ 21	92 79
Enneagon 9	200 170	146 125	140 120	117½ 99	59 49½	53 45½	38 32½	54 46½	78½ 67^{1}	292½ 248½	214 181	52 46	107 91	74½ 64	22½ 19	92 79
Decagon 10	200 170	150½ 129	140 120	119½ 101½	60 51	54½ 47	34½ 29½	58 49½	80½ 69	323½ 275	243 206	57½ 49	113 96	78 66½	20½ 17½	92½ 79½
Endecagon 11	200 170	154½ 132½	140 120	121 103	60½ 51½	56½ 48½	31½ 27	61½ 52½	81½ 69½	355 302	273½ 232½	62 53	117 100	81 69	19 16	93 80
Dodecagon 12	200 170	156 134	140 120	122 104	61 52	58 49½	30 25½	63 54	82½ 71	386 328½	303½ 257½	66 56	122½ 104	84 72½	17½ 15	93 80
Straight line	200 170	200 170	140 120	141 120	70½ 60	70½ 60	0 0	100 85	100 85	Infinite. Infinite.	Infinite. Infinite.	141 120	200 170	141 120	0 0	100 85

This ingenious author alſo gives a table of the lengths of the different lines in his conſtruction on the two following ſuppoſitions:

1ſt. That the exterior ſide of each figure is equal to 200 toiſes.

And 2dly. That the exterior ſide of each figure is equal to 170 toiſes.

Mr. Blondel was undoubtedly a man of conſiderable talents and eminence, and had travelled over the greateſt part of Europe, America, and the Weſt Indies, making ſenſible and judicious obſervations on the various modes of fortifying, practiſed by different nations.

His acuteneſs however in diſcovering the miſtakes committed by others, and his anxiety to avoid them, did not prevent him from falling into ſtill greater ones himſelf. He did not attend ſufficiently to the great expence that the execution of his method would unavoidably occaſion, or to the numerous artillery that would be required for its defence.

Imagining, that places are generally loſt for want of ſufficient flanks, he makes three, one behind another. They are however ſo near to each other, that the rubbiſh of the higher ones muſt certainly render the lower ones uſeleſs: and were ſhells to fall into the lower ones they muſt unqueſtionably deſtroy the troops for want of room to avoid them. They are moreover too open and liable to be deſtroyed from the covert-way, as the counter-guards are not broad enough to cover and ſcreen them from the enemies' fire. The low flanks are too narrow and too much confuſed. Before ſhells, however, were much uſed at ſieges, they might have afforded a good defence.

He makes no uſe of traverſes. But this is not to be imputed to him as a fault or omiſſion, as rocket-firing was not uſed in his time.

His great ditch appears to be too wide, being not leſs than 25 toiſes before the faces of the baſtions.

His angle *diminué* muſt be allowed to be prepoſterouſly great, as he makes it of as many degrees as it ought to be in a conſtruction on a ſtraight line, or on the ſides of a polygon of an infinite or indefinite number of ſides.

The following is the conſtruction according to Mr. Bombelle's method.

Like Count Pagan he eſtabliſhes three ſorts of fortification. But inſtead of conſtructing inwards like him, he conſtructs outwards. His three ſorts he denominates the little royal, the mean, and the great royal. The interior ſide of the little royal is equal to 60 rods of 12 Paris feet each, or 120 toiſes, that of the mean is equal to 70 ſuch rods or 140 toiſes, and that of the great royal is equal to 80 ſuch rods or 160 toiſes. His manner of fortifying in all the three is the ſame, and is the following.

Having determined on the ſide A B, (*fig.* 4.) (which we ſhall here ſuppoſe to be that of a hexagon), for the great, mean, or little royal, allow a fifth part of it for the demi-gorges A C, B D; and a fourth part of it for the flanks C E, D F, each of which muſt make, with the curtain C D, an angle of 100 degrees. Then the points, G, H, of the baſtions are aſcertained by the raſant lines C H, D G, and the whole operation or conſtruction is furniſhed.

As the conſtruction in this figure is ſuppoſed to be made outwards on three of the ſides of a regular hexagon, the angle A O B of the centre is equal to 60 degrees, and the angle G H K of the polygon is equal to 120 degrees. But the angle E C D of the flank is by conſtruction equal to 100 degrees, the demi-gorge A C or B D is equal to a fifth part of the interior ſide A B, and the flank C E or D F is equal to a fourth part of A B. Conſequently the ſum of the angles C D E, C E D, is given equal to 80 degrees, and the ſides C E, C D, are given; wherefore we have this analogy.

As the ſum of the curtain C D and flank C E
Is to their difference,
So is the tangent of 40° half the ſum of the angles C D E, C E D
To the tangent of half their difference.

Hence the angle *diminué* C D E or C D G, the angle C E D the ſupplement of the angle C E G of the *epaule* or ſhoulder, and A G D half the flanked angle, or half the angle of the baſtion, are given.

And as the lengthened curtain A D or B C is given by the conſtruction equal to four fifths of the interior ſide A B, we have the following analogies for D G, the line of defence, and A G the capital of the baſtion.

As the ſine of A G D, half the angle of the baſtion,
Is to the ſine of the angle G A D,
So is the lengthened curtain A D
To the line of defence D G.

And,

As the ſine of A G D, half the angle of the baſtion,
Is to the ſine of the angle *diminué* A D G
So is the lengthened curtain A D
To A G the capital of the baſtion.

In like manner we obtain D E from the triangle C E D by means of the following analogy.

As the ſine of C D E, the angle *diminué*,
Is to the ſine of E C D, the angle of the flank,
So is the flank C E which is given
To the right line D E, which taken from D G, the line of defence, gives E G the face of the baſtion.

And as in this figure, which is ſuppoſed to be a hexagon, the exterior ſide G H, or line joining the ſaliant angles of two adjoining baſtions, is equal to O G the perpendicular diſtance of the point I, the interſection of the lines of defence from G H is obtained by the following analogy.

As radius
Is to the tangent of I G Z, the angle *diminué*,
So is G Z, the half of G H or O G, in this figure,
To I Z, the perpendicular diſtance of I from G H.

And the perpendicular diſtance of the interſection of the raſant lines, or lines of defence, from the curtain, is found by this analogy.

As G H or O G in this figure
Is to the curtain C D,
So is I Z
To the perpendicular diſtance I Y of I from C D.

And in any other regular figure than a hexagon, G H is found by this analogy.

As O A, the radius of the circumſcribing circle,
Is to the interior ſide A B, which is given,
So is $OG = OA + AG$
To G H, the ſide of the exterior polygon.

And as radius
Is to the tangent of I G Z, the angle *diminué*,
So is G Z equal to half G H,
To I Z, the perpendicular diſtance of I from G H.

And as G H, the ſide of the exterior polygon,
Is to C D the curtain, which is known,
So is I Z, the perpendicular diſtance of I from G H,
To I Y, the perpendicular diſtance of I from the curtain.

Mr. Bombelle, in the conſtruction of each of his three ſorts of fortification, makes the angle E C D or F D C of the flank, always equal to 100 degrees, and the angle *diminué* G D C or H C D invariably equal to about 20° 56′.

For CD being always equal to three-fifths of AB, and CE equal to a fourth part of AB, the ratio of CD + CE to CD − CE is a given or conſtant ratio, being that of 17 to 7, whatever be the length of AB. And the conſtruction of his mean fortification gives the demi-gorge AC or BD, equal to 28 toiſes, the curtain CD, equal to 85, the lengthened curtain AD or BC, equal to 112, the flank CE or DF, equal to 35, the line of defence DG or CH, equal to about $153\frac{5}{8}$, the capital AG or BH of the baſtion, equal to about $63\frac{1}{2}$, the face GE or HF of the baſtion, equal to about $61\frac{1}{3}$. And in all the three the ratio of DY half the curtain, to IY the perpendicular diſtance from it to I, the interſection of the lines of defence, or of GZ, half the ſide of the exterior polygon, to ZI, the perpendicular diſtance from it to the ſaid point of interſection, is given or conſtant, being always that of radius to the tangent of 20° 56′. The conſtruction of his mean fortification on the ſides of a hexagon gives ZI, equal to about 38,884 toiſes, and YI to about 16,066 toiſes.

This author makes his main ditch, or the ditch of the body of the place, 12 rods of 12 Paris feet each, or 24 toiſes broad, beyond which and oppoſite to the curtain he places a ravelin, the ſaliant angle of which is in the interſection of two arcs deſcribed with the lengthened curtain AD, or BC, as radius from the extremities A, B, of the interior ſide AB, and the faces of which produced acroſs the main ditch would terminate on the ſhoulders *i*, *i*, of the ſquare orillons, that cover his rounded flanks or caſemates, which are deſcribed in the following manner.

From the extremities C, D, of the curtain, and perpendicularly thereto, he draws two other flanks, C*i*, D*i*, meeting the lines of defence in the points *i*, *i*, lengthening the faces GE, HF reſpectively by E*i*, F*i* in order to have room enough in each flank of every baſtion for two covered ones, which are conſtructed in the following manner:

Take the two lines G*r*, H*r*, equal each to a third part of G*i* or H*i*, (C*i*, D*i* being drawn from the extremities C, D, of the curtain CD perpendicular thereto), and the lines *ik*, *ik*, alſo equal each of them to a third part of C*i* or D*i*. From the points, *r*, *r*, draw right lines, *rkl*, *rkl*, through the points *k*, *k*, terminated at the points *l*, *l*, by the right lines C*l*, D*l*, drawn perpendicularly to the lines of defence GD, HC, which muſt be produced till they meet the radii of the polygon in ſome points as *p*, *p*, in order to take upon the ſame radii the diſtances *pq*, *pq*, for terminating the covered flanks, of which the common centre *x* is found by deſcribing from the extremities D*l*, C*l*, of the right lines C*l*, D*l*, arcs with a radius equal to three-fourths of C*l* or D*l*.

The diſtance between the two covered flanks on each flank of every baſtion is equal to 12 rods of 12 Paris feet each, or twenty-four toiſes, and the parapets every where are 10 ſuch rods or 4 toiſes thick.

The caſemates which Mr. Bombelle adds at the points of the baſtions, and which, in caſes of neceſſity, may ſerve as retrenchments, are deſcribed by taking on the capitals of the baſtions the right lines G*s*, H*s*, equal reſpectively to half the lines G*r*, H*r*, and deſcribing from the points *s*, *s*, as centres, arcs, *rr*, *rr*, for the caſemates, each of which has its parapet 4 toiſes broad. They are ſomewhat lower towards the points of the baſtions than the other parts of the baſtions, and the ways to them are through paſſages as *o*, *o*, in the baſtions.

This author covers his ravelin with a ſort of counterguard or tenaille beyond its ditch, which he makes 8 rods of 12 Paris feet each, or 16 toiſes broad, or a third part of the breadth of his great ditch, thus rendering his ravelin a tenailleid, or horned half-moon.

Round covered flanks were firſt invented by the Italians; and Mr. Bombelle uſes them in order to render them the more capacious, and the fitter for reſiſting the ſhock and effects of the enemies' cannon. They ſeem, however, to have too much convexity, advancing too far towards the centre of each baſtion, and leaving too ſmall a diſtance between the two high flanks.

As his flanks are great, he makes uſe of no ſecond flanks on the curtains. But contrary to ſound ſenſe and reaſon, and inconſiſtently with the genuine principles of conſtruction, he makes them of the ſame lengths or ſizes in all polygons. His angle *diminué* alſo is invariably of a given magnitude, *viz.* of 20° 56′, which by his conſtruction on the ſides of a ſquare leaves the flanked angle, or angle of each baſtion, equal only to 48° 8′ in a pentagon, to 66° 8′, in a hexagon, to 78° 8′, and ſo on. His angle *diminué* in a ſquare, is therefore more than double what it ought to be, by upwards of two degrees. And in a pentagon it does not fail quite $7\frac{1}{2}$ degrees ſhort of being twice as great as it ſhould be in reality. He makes it even greater in a ſquare than it ought to be in an octagon.

Mr. Vauban in his method fortifies inwards; and like Count Pagan, from whom he has borrowed his perpendicular for the hexagon and all higher polygons, begins with the perpendicular to the exterior ſide, and the raſant lines or lines of defence. He does not, however, make the faces of his baſtions ſo long, or his flanks quite ſo ſhort. And he omits ſecond flanks as not of very great moment, as they can be added at any time, without changing either the flanks or curtains.

Biſect, as in Count Pagan's conſtruction, the exterior ſide AB in the point C. (*fig.* 5.) At the point C erect a perpendicular, CD, equal to an eighth part of AB in the ſquare, to a ſeventh part of AB in the pentagon, and to a ſixth part of AB in the hexagon and all higher polygons. From the extremities A, B, through the point D, draw the lines of defence ADH, BDG. On theſe take AE, BF for the faces of the baſtions, equal each to two ſeventh parts of AB, and take EH, FG, each equal to EF, the diſtance between the ſhoulders E and F. Then join the points G, H, for the curtain GH. And if a ſimilar conſtruction be made on each of the other ſides of the figure or polygon, we get the maſter-line of the curtains and baſtions, or the principal or outline of the body of the place. To this muſt be added a rampart from 10 to 12 toiſes broad at the baſe, and elevated more or leſs above the level of the place, on the outer part of which, at top, there is raiſed a parapet three toiſes broad at the baſe, and elevated above the rampart from ſix feet to $7\frac{1}{2}$. The ditch of the body of the place, or the great ditch, is 20 toiſes wide oppoſite to the flanked angles or ſaliant angles of the baſtions, and it is formed by deſcribing from theſe angles with a radius of 20 toiſes, circular arcs, and drawing right lines from the *epaules*, or ſhoulders, to touch theſe arcs. For the parts of theſe lines lying between their interſections and the points of contact, together with theſe arcs, form the outline of the ditch.

The foregoing figure is a regular hexagon, and the exterior ſide is here ſuppoſed to be equal to 180 toiſes.

To determine the ſaliant angle S (*fig.* 6.) of the half-moon or ravelin, ſet off 50 toiſes on the perpendicular DC, produced beyond the exterior ſide AB; from the point S draw right lines to the counterſcarp of the great ditch, ſo that if produced acroſs the ſame, they would, according to ſome authors, terminate on the *epaules* or ſhoulders of the baſtions, but according to others, about 3 toiſes from the ſhoulders on the faces of the baſtions. Theſe lines ſo drawn from the ſaliant angle S, of the ravelin to the counterſcarp, form the faces SL, SM, of the half-moon or ravelin. It is generally ſuppoſed that when the faces SL, SM of the ravelin terminate when produced acroſs the great ditch on the faces of the baſtions a few toiſes from the *epaules* or ſhoulders, they cover the flanks much better than they do when they terminate on the ſhoulders themſelves.

The ditch before each ravelin is 12 toiſes broad; its counterſcarp is parallel to the faces, and is made of a circular form, before the ſaliant angle of each like the ditches before the ſaliant angles of all works in general.

When the ravelin is made with flanks, as PN, QO, the faces SP, SQ, when produced acroſs the great ditch, ought to terminate on the faces of the baſtions 5 toiſes at leaſt from the *epaules* or ſhoulders.

When a ravelin has flanks, they are commonly made by ſetting off 10 toiſes from L to P, and M to Q, from the extremities of the faces, and by drawing them from the points P, Q, parallel to the capital *r*S of the ravelin.

There is ſometimes a redoubt made in a ravelin, which is done by ſetting off from the extremities, L, M, of the faces on the ſemi-gorges L*r*, M*r*, and then drawing right lines for its faces parallel to thoſe of the ravelin. The ditch before ſuch a redoubt ſhould be 6 toiſes broad, and its counterſcarp parallel to its faces.

Orillons and retired flanks are deſcribed in the following manner.

The front, AEG, HFB, being deſcribed as above taken, E*a* equal to a third part of the flank EG. From the oppoſite flanked angle B, draw the right line B*a*, on which produced take *ab*, equal to 5 toiſes. Take alſo on the line of defence, BG, produced, G*e* equal to 5 toiſes, and join *b*, *c*. On *be* as a baſe deſcribe the equilateral triangle *bcf*, and from the angular point *f* as a centre, deſcribe the circular retired flank *be* with the radius *fb* or *fe*.

Again, if E*a* be biſected in the point *c*, and *cd* be drawn perpendicularly to E*a* to meet a perpendicular to the face AE, from the point E in the point *d*, and if from the point *d* as a centre a circular arc be deſcribed with *d*E as radius, we ſhall get the circular orillon E*a*.

ab is called the revers, or back part of the orillon, and G*e*, the *enfoncement* or depth of the caſemate or concave flank *bc*.

In like manner are the retired or concave flank *hi*, and the circular orillon F*g* deſcribed.

The orillons are uſeful in covering the retired or concave flanks, which by means of them cannot be ſeen but directly in front. And as Mr. Vauban makes his orillons round, they cannot be ſo eaſily deſtroyed as they might be were they of any other figure or form.

The calculation of the lines and angles of a conſtruction on a polygon, according to this method of Mr. Vauban, is as follows:

If AB be ſuppoſed to be the ſide of a hexagon, the angle of the centre will be equal to 60°, and the angle of the polygon to 120°. And as the perpendicular CD is by the conſtruction equal to a ſixth part of AB, the angle *diminué* ABD or BGH is determined by the following analogy:

As AC or BC, the half of AB, } or, As 3
Is to CD the perpendicular, } Is to 1,
So is radius
To the tangent of the angle CAD or CBD, which is nearly equal to 18° 26′ 6″. Wherefore the flanked angle or angle of the baſtion is equal to 83° 7′ 48″ nearly. And ſince the triangle EFG is iſoſceles by the conſtruction, and the angle EFG, which is equal to the angle ABD, is of courſe equal to 18° 26′ 6″, we have the angles FEG, FGE, equal each to half the exceſs of 180° above 18° 26′ 6″, or to 80° 46′ 57″ nearly. Wherefore the angle EGH of the flank, which is equal to the angle FGE, together with the angle FGH, or angle *diminué*, is equal to 99° 13′ 3″. And the angle AEG of the *epaule*, or ſhoulder, being equal to the angle EGF or EGD, together with the angle EDG, which is equal to the angles ABD, BAD, taken together, or to twice the angle *diminué*, is equal to 117° 39′ 9″.

Now ſince AC, half of the exterior ſide AB, is given, and CD is found by the foregoing analogy, AD is known, its ſquare being (47 E. 1.) equal to the ſquares of AC and CD; and as AE is equal to two-ſevenths of AB, the exterior ſide ED is known. But AD is to ED, as AB is to EF or FG, which are of courſe known. Or, either of theſe lines may be found by the following analogy.

As the ſine of the angle EFD, which is equal to the angle *diminué*, or to 18° 26′ 6″,
Is to its oppoſite ſide DE,
So is the ſine of the angle EDF, which is equal to 180°, twice the angle *diminué*, or to 143° 7′ 48″,
To the oppoſite ſide EF, the diſtance between the epaules.

And if from EF, or its equal EH, there be taken ED, the complement DH, or its equal DG, will be known. Wherefore the curtain GH is determined by either of the two following analogies.

As AD
Is to the exterior ſide AB,
So is the complement DG or DH
To the curtain GH.
Or, As the ſine of the angle *diminué* DGH
Is to the ſine of the angle GDH, which is = 143° 7′ 48″ nearly,
So is the complement DH
To the curtain GH.

The flank EG is eaſily found by means of either the triangle EFG, or the triangle EDG, as in the following analogies.

As the ſine of the angle FGH, which is = 80° 46′ 57″ nearly,
Is to the ſine of the angle EFG, which is = angle *diminué*, or 18° 26′ 6″ nearly,
So is EF the diſtance between the two oppoſite epaules
To the flank EG.
Or, As the ſine of the angle EGD, which is = 80° 46′ 57″ nearly,
Is to the ſine of the angle EDG, which is = twice the angle *diminué*, or 36° 52′ 12″ nearly,
So is ED the diſtance from the epaule to the interſection of the lines of defence
To the flank EG.

And as half the flanked angle is equal to 41° 33′ 36″, and the angle AHG, which is equal to the angle *diminué*, to 18° 26′ 6″ nearly; the angle formed by the capital of the baſtion, and the lengthened curtain, or the curtain HG produced to meet the ſame, will be equal to 120° 0′ 18″ nearly. Wherefore the lengthened curtain is found by this analogy.

As the ſine of 120° 0′ 18″
Is to the ſine of 41° 33′ 36″, half the flanked angle,
So is AH
To the lengthened curtain: from which, if the curtain HG be taken, we get the demi-gorge.

And the capital of the baſtion is found by this analogy:

As the ſine of 120° 0′ 18″

Is to the ſine of 18° 26′ 6″, the angle *diminué*,
So is AH
To the capital of the baſtion.

And the perpendicular diſtance, DI, of the curtain from the interſection of the lines of defence is found by the analogy, As AB is to CD, ſo is GH to DI.

Suppoſing the exterior ſide AB, as in his mean fortification, to be equal to 180 toiſes, the principal lines belonging to the conſtruction may eaſily be found, as in the following manner.

The perpendicular CD being by conſtruction $= \frac{AB}{6}$ is $=$ 30 toiſes.

The *tenaille* AD or BD being equal to $\sqrt{BC^2 + CD^2}$ is equal to $\sqrt{9000}$ toiſes $= 30\sqrt{10} = 94.8683298$ nearly.

The face BF of the baſtion is commonly equal to 50 toiſes, or two-ſevenths of AB nearly.

The diſtance DF of the *epaule* F from the interſection D of the lines of defence being equal to $BD - BF$, is equal to $10\sqrt{90} - 50 = 44.8683298$ toiſes nearly.

If from the *epaule* F there be drawn Fl perpendicular to the exterior ſide AB, we ſhall have $Bl = \frac{BC \times BF}{BD} = 5\sqrt{90}$ toiſes $= \frac{BD}{2} = 47.4341649$ toiſes nearly; and Fl the perpendicular diſtance of the *epaule* F from the exterior ſide $= \frac{CD \times BF}{BD} = 5\sqrt{10}$ toiſes $= \frac{BD}{6} = 15.8113883$ toiſes nearly.

The diſtance EF, between the two oppoſite *epaules*, E, F, or its equal EH or FG, is equal to $AB - 2\,Bl = AB - BD = \overline{180 - 30\sqrt{10}}$ toiſes $= 85.13167$ toiſes nearly.

The complement DG or DH being equal to $FG - DF$ is equal to $\overline{230 - 10\sqrt{360}}$ toiſes $= 40.26334$ toiſes nearly. The perpendicular diſtance DI of the interſection of the lines of defence from the curtain GH being $= \frac{CD \times DG}{BD}$ is equal to $\overline{23\sqrt{10} - 60}$ toiſes, or 12.7323861846 toiſes nearly. Conſequently the perpendicular diſtance CI between the exterior ſide AB and the curtain GH being equal to $CD + DI$, is equal to 42.7323861846 toiſes nearly.

The curtain GH being equal to ſix times DI, is equal to $\overline{138\sqrt{10} - 360}$ toiſes, or 76.3943171 toiſes nearly.

If Fm be drawn perpendicularly from the *epaule* F to AH, the line of defence, Em, being equal to $\frac{EF \times BC}{BD}$ is equal to $\overline{54\sqrt{10} - 90}$ toiſes, or 80.76299365 toiſes nearly.

The perpendicular Fm being to Em as CD is to BC, is equal to a third part of Em or $\overline{18\sqrt{10} - 30}$ toiſes, or 26.921 toiſes nearly.

The diſtance mH of the point m from the extremity H of the line of defence being equal to $EH - Em$, is equal to $\overline{270 - 84\sqrt{10}}$ toiſes, or 4.3686765442 toiſes nearly.

The diſtance Dm of the point m from the interſection D of the lines of defence being equal to $Em - DF$ or $Em - DE$, is equal to $\overline{24\sqrt{10} - 40}$ toiſes, or 35.8946538448 toiſes nearly. But ſince FEH is an iſoſceles triangle, the angle FEH or DBC is equal to twice the angle mFH, which is therefore equal to 9° 13′ 3″ nearly.

The flank FH being equal to $\sqrt{Fm^2 + mH^2} = 3\sqrt{16400 - 5100\sqrt{10}}$ toiſes, is equal to 27.27322895 or 27.273 toiſes nearly. And if from the extremity H of the line of defence AH there be drawn Hn to meet the face FB of the baſtion in the point n, we ſhall have Hn equal to $\frac{DH \times Fm}{Dm} = \frac{\overline{230 - 60\sqrt{10}} \times \overline{18\sqrt{10} - 30}}{24\sqrt{10} - 40}$ toiſes, or 30.1976 toiſes, exceeding the perpendicular CD to the exterior ſide by 0.1976 of a toiſe only.

And as Fn is a fourth proportional to Dm, mH, and DF, or is equal to $\frac{mH \times DF}{Dm} = \frac{\overline{270 - 84\sqrt{10}} \times \overline{30\sqrt{10} - 50}}{24\sqrt{10} - 40}$ toiſes, it is equal to 5.461 toiſes nearly. And Dn is equal to 50.3292 toiſes nearly.

Now in Count Pagan's conſtruction, from whom Mr. Vauban has borrowed the length of his perpendicular, on which the other parts chiefly depend, the flank FH is equal to $\overline{18\sqrt{10} - 33}$ toiſes, or to 23.921 toiſes nearly, which falls ſhort of the perpendicular Fm, drawn from the *epaule* F, in Vauban's conſtruction, to the line of defence AH, by 3 toiſes, and of the flank FH by 3.35222895 toiſes. In any polygon, having its exterior ſide equal to 180 toiſes, their perpendiculars are equal, as well as the ſaliant angles of their baſtions. And we are perſuaded, that even the greateſt admirers of Vauban can aſſign no good reaſon for his not having followed Count Pagan alſo, with regard to the poſition of his flank, and placed it at right angles to the line of defence, inſtead of making them meet in an angle of 80° 46′ 57″. There is great reaſon to ſuppoſe, that the Count would have made the face of his baſtion conſiderably ſhorter than he did, had he not intended to have three flanks inſtead of one. He makes it 55 toiſes. But it is naturally to be preſumed, that, had he intended to conſtruct with a ſingle flank, he would have biſected the perpendicular diſtance between his orillon and inner flank, (which is 19 toiſes,) and drawn his flank at right angles to the line of defence through this point of biſection, thereby forming a more complete conſtruction for the body of the place than Vauban has done. And it is ſomewhat remarkable, that this line nearly coincides with the perpendicular Hn, to Vauban's line of defence, from its point H of interſection with the flank. Had he therefore, inſtead of taking 5 toiſes from the face of Count Pagan's baſtion, taken 10, and then placed his flank at right angles to the line of defence, he would, without lengthening this line, have given the face of his baſtion its proper length, and, at the ſame time, made the flank itſelf about equal to the perpendicular, as it ought to be, ſince perpendiculars to the exterior ſides of polygons were firſt introduced into conſtruction for the ſole purpoſe of obtaining flanking defences. The lengths, however, with both theſe authors, as well as the other writers on fortification, are merely arbitrary, and by no means derived from reaſoning either on the properties of the figures, or their relative degrees of importance and capability of defence. For there appears no reaſon for giving the ſame perpendicular to a hexagon and every other polygon of a greater number of ſides, as Vauban has done, or to all regular figures above the ſquare, as Count Pagan has done.

This author retains part of the fauſſe-bray, which uſed to go round the whole body of the place, at the diſtance of from 4 to 5 toiſes from the ſame, making uſe of it as *tenailles* oppoſite to his curtains, which are made differently.

A tenaille is commonly from two to three feet only higher than the level ground of the ravelin. The tenaille *abcdefg*, (*Plate* VI. *fig.* 7.) is conſtructed by firſt ſetting off from the epaules E, F, on the lines of defence E*a*, F*g*, equal each to three toiſes, for a paſſage between it and the flanks of the baſtions; then taking *ab*, *gf*, for its faces, equal each of them to 16 toiſes, by deſcribing from the ſhoulders *b* and *f*, as centres arcs with a radius equal to *bf*, and then by interſecting theſe arcs from the ſame ſhoulders as centres, with a radius equal to 10 toiſes, for its flanks *bc*, *fe*. Some, however, make the faces *ab*, *gf*, equal to half the lines *a*D, *g*D reſpectively, and place the flanks at right angles to the lines of defence, which is certainly the beſt poſition for them.

The tenailles *abcd*, *efgh*, (*fig.* 8.) are without flanks, and have their faces on the lines of defence. The paſſage between them, as well as the paſſages between them and the flanks, are three toiſes wide. Theſe are called *ſimple tenailles*, and the foregoing is called a *reinforced tenaille*. There is alſo a third ſort of tenailles, which have only faces *ab*, *gf*, and flanks *bc*, *fe*, without a curtain *ee*.

Simple tenailles, with their faces on the lines of defence, but without flanks, are not ſo well calculated for ſcouring and defending the ditch as either the *reinforced tenailles* are, or thoſe with faces, and flanks without curtains. However, as they are not liable to be enfiladed, Mr. Vauban has generally preferred them to the other two, in moſt of the places which he fortified.

The *reinforced tenailles* defend the ditch much better, and add low flanks to thoſe of the baſtions, but are liable to have their own flanks enfiladed, an inconvenience that might be remedied by conſtructing them in ſuch a manner as to be covered by the extremities of the parapets of the oppoſite ravelins, or by the adjoining *lunettes*. Theſe are well calculated for ſcouring not only the ditch, but alſo the level ground of the ravelin, and the ditch before the *corps de guard*, *reduit*, or redoubt, commonly made within it, which cannot be ſo well ſeen or defended from any other parts.

Thoſe with faces and flanks only, have the ſame advantages with theſe as to the defending or ſcouring of the ditch, but are alſo, like them, liable to have their flanks enfiladed, which ſhould be guarded againſt in the ſame manner.

The better to ſcour and defend the ditch, and oppoſe its paſſage, this fortifier places in it, oppoſite to the middle of the *tenaille*, or of the curtain, a caponiere, or double way, covered with a parapet raiſed three feet above the bottom of the ditch. It is about 12 feet broad, is perpendicular to the curtain, and is paliſaded on both ſides. This work is good, and very uſeful, as it commands without being commanded, and ſerves as a paſſage for the muſketeers from the body of the place to the outworks. He thus has four flanks for the defence of his ditch, namely, that of the body of the place, that of the orillon, that of the tenaille, and the caponiere.

Tenailles are reckoned ſo neceſſary, that it is with good reaſon that there are few places fortified without them. For when the ditch is dry, the ſpaces behind them ſerve as places of arms, from which the troops may ſally to oppoſe the enemies' deſcent of the ditch, to retard his operation, and deſtroy his works in it, and then retire to them as places of ſafety. They alſo render the communication between the body of the place and the ravelins more eaſy and ſecure, which is a great advantage, as the ravelins are thereby enabled to make a much better defence than they otherwiſe could do, being readily ſupplied at any time with troops and neceſſaries. And when the ditch is wet, the ſpaces behind them ſerve as harbours for boats, which armed men can make uſe of, both for oppoſing the paſſage of the ditch, and for facilitating the communication between the tenailles and the ravelins.

This fortifier, in order to increaſe the ſtrength of a place, places frequently works called *lunettes* (which literally ſignify ſpectacles) on both ſides of his ravelin. He ſometimes makes one face of his lunette perpendicular to the middle of the face of the ravelin, and ſometimes perpendicular to the face of the ravelin, and ſo as produced to the ſame about one-third from the ſaliant angle. In the former caſe he makes that face of the lunette equal to 30 toiſes, and determines its other faces by taking for the demi-gorge 25 toiſes, on the counterſcarp of the great ditch from that of the ditch before the ravelin; and in the latter he makes the demi-gorge equal to 20 toiſes only. The ditch before the lunettes is 12 toiſes broad, the thickneſs of the parapet is equal to three toiſes, and that of the rampart to eight, as in the ravelin.

When he makes uſe of lunettes, he ſometimes covers the ſaliant angle of the ravelin with a work called *bonnet*, of which the faces are parallel to thoſe of the ravelin, and when produced biſect thoſe of the lunettes. The ditch before it is ten toiſes wide.

Tenaillons. The term *tenaillon* is ſometimes applied to a reinforced tenaille; but it is generally confined to a work ſomewhat like a lunette, made on each ſide of a ravelin, but differing from a lunette in this circumſtance, that one of the faces of a tenaillon, though it is 30 toiſes long, like that of the lunette, is in the direction of the ravelin produced beyond its ditch, whereas that of the lunette is perpendicular to it. The other face of the tenaillon is determined by taking 15 toiſes on the counterſcarp of the great ditch from that of the ravelin. There is ſometimes in a tenaillon a battery 15 toiſes long, and 10 toiſes retired from the front and parallel thereto.

There are generally retrenchments in tenaillons which have their parapets either parallel to their fronts or perpendicular to their other faces, which, when produced, terminate on the faces of the baſtions. The ditch before ſuch a retrenchment is about three toiſes wide; and as theſe works are commonly made of earth, without any revetement of maſonry, there is a banquette, called *berm*, before the parapet, next to the ditch, about eight feet broad, to prevent it from falling into the ſame.

As to the conſtruction of counter-guards, horn-works, crown-works, covert-ways and glaces, detached redoubts, ſecond ditches, and covert-ways, and profiles. See the ſame under theſe articles reſpectively.

Mr. Vauban, in his ſecond method with tower-baſtions, according to the plans of Landau and Beſford, begins with his conſtruction inwards, and fortifies outwards in the following manner.

Suppoſing A B (*fig.* 9.), to be the interior ſide of the hexagon of 120 or 130 toiſes, draw A C, B D from the centre thereof, through the extremities A, B; ſet off ſix toiſes from A to *b*, and from B to *c*; through the points *b* and *c*, draw right lines at right angles to A B, on which ſet off ſix toiſes from *b* to *f*, and *c* to *h*, and four toiſes from *b* to *d*, and *c* to *g*; and from the points *f*, *d*, draw perpendiculars *fr*, *dn*, to the capital A C, as alſo from the points *h*, *g*, perpendiculars to the capital B D. Then, if *r* E be taken equal to *rf*, and *p* F to *ph*, the points E, F, will be the ſaliant angles of the tower-baſtions, of which E*fdn* and F*hgq* are the halves.

If on the capitals A C, B D, there be taken E C, F D, equal each to 40 toiſes, the points C, D, will be the ſaliant angles of the counter-guards before the towers. From the points C, D, draw the lines of defence C*c*, D*b*, to the points *c*, *b*, where the flanks of the towers interſect the curtain. On theſe ſet off 56 toiſes, from C to G, and D to H, for the faces C G, D H, of the counter-guards. The flanks and tenailles are found or determined as in his firſt method.

The ditch before the ſaliant angles of the towers is ſix toiſes broad, and its counterſcarp is drawn to the extremities of the flanks of the counter-guards. The right line, which joins the ends of theſe flanks, determines the inſide of the tenailles.

The ditch before the counter-guards is 12 toiſes broad at the ſaliant angles, and its counterſcarp is drawn towards the oppoſite ſhoulders, in the ſame manner as in his firſt method.

The capital of the ravelin is 45 toiſes, and its faces, when produced, terminate on thoſe of the counter-guards, about 10 toiſes from the ſhoulders. Ten toiſes, however, are cut off from the faces of the ravelin, for the flanks which are parallel to its capital.

The ditch before the ravelin is 10 toiſes broad, the covert-way five, the ſemi-gorges of the places of arms 12 each, the faces 17 each, and the glacis is 20 toiſes broad.

The conſtruction of Mr. Vauban's third method, according to the plan of New Briſach, is applied to an octagon, of which the exterior ſide is equal to 180 toiſes, and is made inwards. The perpendicular to the exterior ſide is, as in his firſt method, equal to 30 toiſes. The faces of the counter-guards are each of them equal to 60 toiſes. The flanks are found by ſetting off 22 toiſes, in arcs deſcribed from the oppoſite ſhoulders, as centres, and with the diſtance between as radius. A right line drawn through the extremities of the flanks, parallel to the exterior ſide, to meet the capitals of the counter-guards, determines both the inſide of the tenailles, and the ſaliant angles of the tower-baſtion.

And if another right line be drawn parallel to this, at the diſtance of nine toiſes from it, the points, where it meets or interſects the capitals of the counter-guards, will be centres of the towers; from which points, if ſeven toiſes be ſet off each way for their demi-gorges, the poſitions of their flanks, which are perpendicular to the ſaid line, will be determined. For each of theſe flanks, five toiſes are ſet off outwards, and four from the ſaid line. And the line joining the inſide of the flanks at the end of four toiſes completes the towers.

The ditch is ſix toiſes broad before the ſaliant angles of the towers, and its counterſcarp meets the line joining theſe angles, within ten toiſes of the extremities of the flanks of the counter-guards.

The great ditch before the counter-guards is 15 toiſes broad, and its counterſcarp is parallel to the faces. The capital of the ravelin is 55 toiſes in length, and that of the redoubt within it, is equal to 23 toiſes. The faces of the ravelin are drawn towards thoſe of the counter-guards, within 15 toiſes from the ſhoulders, and thoſe of the redoubt are parallel to theſe. Twelve toiſes are cut off from each face of the ravelin, and ſix from each of the redoubts by the flanks, which are parallel to its capital. The ditch before the ravelin is twelve toiſes wide, and that before the redoubt is ſix. The covert-way and glacis are the ſame as in his ſecond method. The profiles alſo are nearly the ſame in both. This method, indeed, differs but little from his ſecond, except in two ſmall flanks, of about four toiſes each, which in this he makes in each curtain, that are not in the other. The parapets of his counter-guards, on both ſides of the ſaliant angles for the diſtance of about twenty feet, are raiſed four feet higher than the reſt, to prevent theſe works from being annoyed by ricochet-batteries.

In Mr. Vauban's firſt method of military conſtruction, it may not be amiſs to give a table of the principal parts thereof, for drawing the maſter-line by, as alſo an ichnographical one of the principal dimenſions of the body of the place, tenailles, ravelin, covert-way, traverſes, and places of arms, as publiſhed with his approbation (for he never publiſhed any thing himſelf reſpecting it.)

TABLE for the Conſtruction.

	Forts.						Little Fortification.				Mean.		Great.	
Side of Figure, or Polygon.	80	90	100	110	120	130	140	150	160	170	180	190	200	260
Perpendiculars.	10	11	12½	14	15	16	20	21	23	25	30	31	25	22
Faces of Baſtions.	22	25	28	30	33	35	40	42	45	47	50	53	55	60
Capitals of Ravelins.	25	28	30	35	38	40	45	50	50	52	55	55	60	50

And the following is an ichnographical table of the thickneſſes, &c. of the works compoſing the body of the place, &c.

		Toiſes.
Of the Body of the Place.	Thickneſs of the rampart at its baſe	11
	Thickneſs of the parapet at its baſe	3
	The breadth of the ditch	20

		Toiſes.
Of the Tenaille.	Its diſtance from the orillon of the baſtion	3
	Thickneſs of its rampart in the face and flank at the baſe	7
	Thickneſs of the rampart of its curtain at the baſe	5
	Thickneſs of its parapet at the baſe	3

Thickneſs

		Toiſes.
Of the Half-moon or Ravelin.	Thickneſs of its rampart at the baſe	10
	Thickneſs of its parapet at the baſe	3
	The breadth of its ditch	12
Of the Covert-way, Traverſes, and places of Arms.	The breadth of the covert-way	5
	Length of the demi-gorge of the places of arms at the re-entering angles	10
	Length of the faces, each of the places of arms	12
	Length of the traverſes at the re-entering angles	5
	Length of the traverſes at the ſaliant angles	$4\frac{1}{4}$
	Thickneſs of each traverſe at the baſe	3

The traverſes on the ſides where their banquettes are, or on their inſides, are from 5 to $5\frac{1}{2}$ feet high, and from 3 to 4 on the outſide, towards the covert-way, which they ſcour at the re-entering angles.

He gives his caponiere a banquette on each ſide, and the parapet of the place two or three, to ſuit men of different heights or ſtature, that they may all of them fire on the ſame level.

He makes a cut oppoſite to each traverſe in the parapet of the covert-way, $4\frac{1}{2}$ or 5 feet deep, for the ſoldiers to paſs, which he ſhuts up with a ſmall merlon, except at the ſaliant angles, where ſuch cuts could not be ſeen by thoſe who defend the place.

When he gives flanks to his ravelin, he makes places of arms in its ditch, perpendicular to its faces, and near the angles of the epaules, to prevent the paſſage of the ſame. When the counterſcarp of the ditch is reveted, or faced with maſonry, he makes ſteps at all its angles for the convenience of the troops, and the ſervice of the covert-way. Each detached piece or work ſhould, for a ſimilar reaſon, have a pair of ſtairs to lead up to it.

He makes the countermines of a place under the terreplain of the rampart, on a level with the ditch, and about ten feet diſtant from the *revetement*, to which they are parallel, and have a communication with it through ſmall arched *heads*, or paſſages. From the countermines of the place men go down into the caponieres, and then up into the countermines of the covert-way, from which *heads* or paſſages are carried on under the field to *fourneaux* or ſmall mines, made for blowing up the beſieger's works, and retarding their approaches.

He was of opinion, that when an eminence falls gradually from its ſummit towards the glacis of a place, works ought to be made one before another, with their ſaliant or flanked angles ſufficiently raiſed; that the moſt diſtant ought to cover all the reſt, and draw its defence from them; and that they ought all of them to be built in ſuch a manner, as to prevent an enemy from making a retrenchment in the firſt, without being expoſed to the fire of the ſecond; or in the ſecond, without being expoſed to that of the third, and ſo on.

The glacis ſhould as often as poſſible be compoſed of pebbles, or of ſtones covered with turf, ſince the beſiegers can work but ſlowly in it when ſo made, and the parapets thrown up in it by the pioneers, are apt to occaſion their being killed or wounded, as the cannon-ſhot of the place ſtriking againſt, ſcatter the ſtones, and make them fly in different directions.

He obſerves, that the bridges of his curtains do not interfere with the fire from his flanks along the faces of the baſtions in the ditch, and he prefers that ditch which, by means of ſluices, can be filled or emptied at pleaſure.

The conſtruction of the Chevalier de Ville's method of fortifying is the following.

He begins inwards, and conſtructs outwards. He makes his flanks equal to the demi-gorges, and each of them equal to a ſixth part of the ſide of the figure or polygon on which he conſtructs. In the ſquare and pentagon, he determines the flanked angle or ſaliant angle of the baſtion by a raſant line; but in all figures and polygons of a greater number of ſides than five, he makes it equal to a right angle, by deſcribing a ſemicircle, as E G N on a right line, (*fig.* 10.) E N joining the epaules E and N, thereby making a ſecond flank, as D I, C H, which increaſes with the number of ſides in the figure or polygon. The length A G, of the capital of the baſtion is, in this caſe, equal to the gorge line C P, or the diſtance between the points where the flanks of the baſtion meet the adjoining curtains, a circumſtance which furniſhes an eaſy method of finding the points of the baſtions.

In conſtructing his caſemates, or retired flanks and orillons, he ſets of from C and D, on the flanks C E, D F, lines equal each to a third part of C E or D F, or of the demi-gorge, as D *a*, for inſtance, on D F. He alſo takes F *b* in the face H F produced, equal to D *a*, and then draws *b c* parallel to F *a*, to meet a right line joining *a*, and G the point of the oppoſite baſtion. Then *b c* is the front of the orillon, when it is made ſquare. But when he makes it round, he deſcribes two arcs from *b* and *c*, as centres, with a radius equal to *b c*, and from their interſection as a centre through the points *b*, *c*, he deſcribes the arc of his orillon.

The calculation of the lines and angles, according to his conſtruction, may be made in the following manner.

If we ſuppoſe A B to be the ſide of a hexagon, the angle A O B of the centre will be equal to 60 degeees, and the angle B A S, or A B T, of the figure, equal to 120°. And as the flank is by the conſtruction perpendicular to the curtain, the angle E C D of the flank is, of courſe, equal to 90 degrees. But as the flanked angle E G N is alſo equal to 90 degrees, the half of it, A G I, is equal to 45 degrees, and conſequently the angle *diminué* A I G, being equal to half the exceſs of the angle of the polygon above the flanked angle, is equal to 15°. And the angle of the epaule is of courſe equal to 105°.

Wherefore, if A B be aſſumed of a given length, whether equal to 120 toiſes, or otherwiſe, the capital A G of the baſtion, and the gorge-line C P, which is equal to it, is eaſily found by the following analogy, and the iſoſceles triangle C A F.

As the ſine of the angle A C P, or A P C, half the exceſs of 180° above the angle of the polygon, or half the angle of the centre,
Is to the ſine of the angle of the polygon or centre,
So is the flank of the baſtion or $\frac{AB}{6}$
To the gorge-line C P, or capital of the baſtion A G.

And the raſant line G I, in the oblique-angled triangle A G I, is found by this analogy.

As the ſine of the angle *diminué* A I G

Is to the ſine of the angle G A I, or its ſupplement O A I, half the angle of the polygon,
So is the capital A G of the baſtion
To the raſant line G I.

And the line A I is obtained from the ſame triangle, by this analogy.

As the ſine of A I G the angle *diminué*
Is to the ſine of A G I, half the flanked angle,
So is the capital A G of the baſtion
To the line A I.

From which, if there be taken the flank or demi-gorge, there will remain the complement C I; which, taken from the curtain C D, leaves the ſecond flank D I. The complement C I is alſo eaſily found from the right-angled triangle, E C I, by the following.

As radius
Is to the tangent of the angle C E I = 90° — the angle *diminué*,
So is the flank E C, a ſixth part of A B,
To the complement C I.

The ſide G H of the exterior polygon is determined by taking a fourth proportional to O A, A B and O A + A G.

The foregoing methods of conſtruction have been called the *French manner*, particularly thoſe of Count Pagan and Mr. Vauban, who borrowed from him the length of his perpendicular, which is the principal part of conſtruction, and that on which all the other parts chiefly depend. Vauban's method, however, has been chiefly followed on account of its plainneſs and ſimplicity, with a ſingle flank. It is proper, nevertheleſs, to give the conſtructions of ſome of thoſe methods of fortifying that have been made uſe of in other nations.

The Italians, who have not been anxious about making the flanked angle, or angle of the baſtion, either right or obtuſe, but prefer having it acute for the purpoſe of getting a ſecond flank on the curtain, have ſeveral methods of fortifying delivered by their authors, amongſt which that of Sardi has been eſteemed one of the beſt.

He begins inwards and conſtructs outwards, ſuppoſing A B equal to 800 geometrical paces or feet (*fig.* 11.). Of theſe he allows 150 for the demi-gorge A C or B D, and the ſame for the flank C E or D F, which he places perpendicularly to the curtain C D, on which he takes an eighth part D I for the ſecond flank, making I the point in the curtain, from which the raſant line drawn through E the extremity of the flank or angle of the epaule, gives the ſaliant point G of the baſtion on the lengthened radius O A. And this operation, continued round the figure or polygon, completes the conſtruction.

He makes a caſemate in each flank, capable of holding three pieces of cannon, by ſetting off from the extremity of the curtain on the demi-gorge, a line equal to a third part of the flank, and the ſame on the flank itſelf. And he makes his orillons either ſquare or round.

He places ſquare cavaliers on the middle of his curtains, of which the faces are parallel to the parapet of the rampart, and 30 feet diſtant from the ſame. In each of theſe he puts 7 pieces of cannon, three of which look into the field, and the other four towards the two adjoining baſtions to flank ſuch breaches as the beſiegers may make in the faces of them, and prevent them from giving the aſſault.

The calculation of the principal lines and angles in Sardi's conſtruction, may be made in the following manner.

Since the interior ſide A B is by ſuppoſition equal to 800 geometrical paces or feet, and the demi-gorge A C, and flank C E, each equal to 150 of theſe, the curtain C D is equal to 500, and the ſecond flank D I, which is the eighth part thereof, is equal to 62½. Conſequently the complement C I is equal to 437½ ſuch feet or paces.

But if we ſuppoſe A B to be the ſide of a hexagon, the angle A O B of the centre will be equal to 60°, and the angle S A B or A B T of the polygon will be equal to 120°. And the angle E C D of the flank is by the conſtruction equal to 90 degrees.

The angle *diminué* C I E is therefore found from the right-angled triangle E C I by this analogy.

As the complement C I
Is to the flank C E,
So is the radius
To the tangent of the angle *diminué* C I E, which is about 18° 55′. If this be added to the angle of the flank, which is equal to 90°, we get 108° 55′ for the angle C E G of the *epaule*. And if the ſaid angle *diminué* of 18° 55′ be taken from the angle O A I, or half the angle of the polygon, which is here equal to 60°, we get 41° 5′ for the angle A G I half the flanked angle. Conſequently the flanked angle is about 82° 10′.

If to the complement C I we add the demi-gorge A C, we get A I equal to 587½ ſuch feet or paces, and the raſant line G I is therefore found from the oblique-angled triangle A I G by the following analogy.

As the ſine of half the flanked angle A G I
Is to the ſine of the angle G A I, or of half the angle of the polygon,
So is the line A I
To the raſant line G I.

The capital A G of the baſtion is alſo obtained from the ſame triangle by this analogy.

As the ſine of half the flanked angle A G I
Is to the ſine of the angle *diminué* A I G,
So is the line A I
To the capital A G of the baſtion.

If to the curtain C D we add the demi-gorge A C, we get the lengthened curtain A D, equal to 650 ſuch feet or paces, and from thence by means of the oblique-angled triangle G A D the fichant line G D in the following manner.

As the ſum of the lengthened curtain and capital A D, A G,
Is to their difference,
So is the tangent of half the ſum of the angles A G D, A D G, or of one quarter of the angle of the polygon,
To the tangent of half their difference, which is found to be about 12° 31′. This taken from 30° one quarter of the angle of the polygon, or 120°, leaves 17° 29′ for the angle A D G, and added to the ſame gives 42° 31′ for the angle A G D. Wherefore,

As the ſine of the angle A D G
Is to the ſine of the angle G A D, or of half the angle of the polygon,
So is the capital A G of the baſtion,
To the fichant line G D.

The Italian writers on fortification ſeem fond of having the flanked angles, or angles of the baſtions acute, in order that the faces of the baſtions, on the ſame ſide of the place, may defend one another, and ſerve as flanks when the caſemates and flanks are battered down or ruined. But the ſecond flank on the curtain is by this conſtruction too ſmall to make the flanked angle always acute. To make it anſwer this purpoſe, it would be an improvement of it to make the ſecond flank increaſe in length, as the number of the baſtions, or of the ſides of the figure increaſes.

It is perhaps worthy of remark, that the angle A D G by this conſtitution on a hexagon, exceeds that ſubtended by the true perpendicular of a hexagon by about 17′ only.

The angles of the ſquare and pentagon are too ſmall for a ſecond flank. And the Chevalier de Ville, whoſe conſtruction much reſembles Sardi's in ſeveral reſpects, appears to have borrowed from him the idea of making his flanks equal to his demi-gorges. He takes care however to avoid ſecond flanks in the ſquare and pentagon, and in other figures to make them increaſe with the number of the ſides of the figure.

The following is the conſtruction of the Dutch method of fortifying according to Marolois.

Before he begins his conſtruction he aſcertains the magnitude of the flanked angle, or angle of the baſtion, by adding 15° to half the angle of the polygon, which makes it in the ſquare equal to 60°, in the pentagon equal to 69°, in the hexagon equal to 75°, in the heptagon equal to about 79° 17′, in the decagon equal to 87°, in the dodecagon equal to 90°, which he alſo allows for it in all figures or polygons of a greater number of ſides.

He makes the curtain I K (*fig.* 12.) equal to 36 rods of 12 Paris feet each, or 72 toiſes, the face of the baſtion A F equal to 24 ſuch rods or 48 toiſes, making the ratio of the curtain to it a ſeſquialteral one, or that of 3 to 2. He makes the flank-forming angle F M I equal to 40°, when he wiſhes to have only a ſingle flank, in order that the demi-gorge I M may be to the flank in the ratio, nearly of 6 to 5, and equal to 35° only, when he intends to have a covered flank, making then the ratio of the demi-gorge to the flank about that of 7 to 5.

Let A B be an exterior ſide. Make the angle B A O equal to half the angle of the polygon. Biſect the ſame by the right line A P. Take the angle P A E equal to 7° 30′. On the raſant line A E ſet off from A 48 toiſes for the face A F. From the epaule F draw the perpendicular F G, and produce G F indefinitely towards I, making at the point F an angle I F M of 50°. Draw through the point M, where the line F M meets the radius A O, an indefinite right line, M N, parallel to the exterior ſide A B, which will be a ſide of the inward polygon. Take the curtain I K, equal to 72 toiſes, and the line G H equal to it. Join K H, and on it take K L equal to the flank I F.* Make the demi-gorge K N equal to the demi-gorge I M, and H B equal to A G. Draw the face B L, and the capital B N, which, being produced, will meet the capital A M alſo produced in the centre O.

The calculation of the principal lines and angles of the conſtruction on the ſides of a polygon fortified, according to Marolois's method, may be made in the following manner.

If we ſuppoſe A B to be the ſide of a hexagon, we have the angle of the centre equal to 60°, the angle of the polygon equal to 120°, and conſequently O A B half the angle of the polygon equal to 60°. Wherefore O A E, half the flanked angle, is equal to 37° 30′, which taken from O A B, half the angle of the polygon or 60°, leaves 22° 30′ for the angle *diminué* E A B. But the angle of the flank is a right angle by the conſtruction. If to this then there be added the angle *diminué*, we ſhall have 112° 30′ for the angle A F I of the *epaule* or ſhoulder, from which if the angle I F M, which is equal to 50°, be taken, there will remain 62° 30′ for the angle A F M. The angle A M F is = 80°.

The capital A M of the baſtion is found from the oblique-angled triangle A M F by this analogy.

As the ſine of the angle A M F

Is to the ſine of the angle A F M,

So is the face A F of the baſtion

To the capital A M.

And the line M F is found by this analogy.

As the ſine of the angle A M F

Is to the ſine of the angle F A M,

So is the face A F of the baſtion

To the line F M.

The flank I F is found from the right-angled triangle M I F by this analogy.

As radius

Is to the ſine of the flank-forming angle I M F=40°,

So is the line F M

To the flank I F, which is equal to about 19 toiſes.

And the demi-gorge M I is found from the ſame triangle by this analogy.

As radius

Is to the ſine of the angle I F M=50°,

So is the line F M

To the demi-gorge M I, which is equal to about $22\frac{2}{3}$ toiſes, the double of which or $45\frac{1}{3}$ toiſes added to the curtain I K, which is equal to 72 toiſes, gives the interior M N, equal to about $117\frac{1}{3}$ toiſes.

The exterior ſide A B is determined by means of the line A G, which is found from the right-angled triangle A G F, by this analogy.

As radius

Is to the ſine of the angle A F G = 67° 3′,

So is the face A F of the baſtion, which is equal to 48 toiſes,

To the line A G, which is equal to about $44\frac{1}{3}$ toiſes, the double of which added to G H, that is, equal to 72 toiſes, gives $160\frac{2}{3}$ toiſes for the exterior ſide A B.

The ſecond flank E K is determined by means of the complement E I, which is found from the triangle E I F, by either of the following analogies.

As the ſine of the angle *diminué* I E F=22° 30′

Is to the ſine of the angle E F I=67° 30′,

So is the flank I F

To the complement I E.

Or, As radius

Is to the tangent of the angle E F I=67° 30′,

So is the flank I F

To the complement I E, which is equal to about $45\frac{5}{6}$ toiſes, and which taken from the curtain, which is equal to 72 toiſes, leaves $26\frac{1}{6}$ for the ſecond flank E K or I C.

The perpendicular diſtance of the interſection of the lines of defence, from the middle of the exterior ſide A B, is found by this analogy.

As radius

Is to the tangent of the angle *diminué*, which is=22° 30′;

So is half the exterior ſide A B

To the perpendicular from it to the interſection of the lines of defence, which is therefore equal to about $32\frac{1}{2}$ toiſes.

This conſtruction furniſhes an eaſy method of working on the ground, when through interruptions from buildings, hedges, thickets, &c. and from the unevenneſs and irregularity of the ground itſelf, a regular polygon cannot eaſily be deſcribed by finding the centre of the circumſcribing circle. For ſuch a polygon may be traced on the ground by means of the maſter-lines of the curtains and baſtions, ſetting off firſt ſucceſſively the angle of the polygon without any reference to the centre. This author, however, inſtead of making his flank equal to his perpendicular, as it ought to be, makes it fall ſhort of the ſame by not leſs than $13\frac{1}{2}$ toiſes.

There are other methods of conſtruction delivered by Dutch writers, which, however, are hardly deſerving of notice. And as in all their methods, they make a ſecond flank on the curtain, and for the moſt part draw at the ſame time the counterſcarp of the great ditch parallel to the faces of the baſtions, they render the defence very defective. For the branches of the counterſcarp being thus parallel to the fichant lines, will, when produced, frequently meet the curtains, and will of courſe cover the greateſt part of the ditch itſelf, from the view of the flanks of the baſtions. And as the principal part of the ditch is thus ſeen by the ſecond flanks only, which are eaſily ruined, the entrance into it is rendered eaſy to the beſiegers.

The following is the conſtruction of the Spaniſh method of fortifying.

Take the interior ſide A B (*fig.* 13.) equal to 120 toiſes. From A to C, and B to D, ſet off 20 toiſes or a ſixth part of A B, for each of the demi-gorges A C, B D. On perpendiculars to A B at the points C, D, take C E, D F, equal reſpectively to A C, B D, or to 20 toiſes each, or a ſixth part of A B. Let O be the centre of the circle, which circumſcribes the polygon, of which A B is a ſide. From D through E, and C through F, draw right lines to meet the radii O A, O B, of the ſaid circle, produced in the points G, H. Then E G, F H will be the oppoſite faces of the baſtions C E G P Q, D F H R S, and A G, B H their capitals. And the ſame conſtruction continued on the other ſides A M, M T, T V, V N, N B, completes the operation.

The calculation of the principal lines and angles of this conſtruction is made in the following manner.

Since A B is equal to 120 toiſes, and A C, B D, each equal to 20, the curtain C D is equal to 80 toiſes. And ſince C E, D F, are each equal to 20 toiſes, or the ſixth part of A B, and alſo perpendicular to A B by the conſtruction, C D is to C E as four to one, and as radius to the tangent of the angle C D E, which is therefore equal to about 14° 2′. Wherefore the angle C E D is equal to about 75° 58′, and the angle C E G of the epaule or ſhoulder is equal of courſe to about 104° 2′. Theſe angles, therefore, are the ſame in all polygons. But the flanked of conſequence, with the angles of the polygons.

Now, if we ſuppoſe A B to be the ſide of a hexagon, we have the angle A O B of the centre equal to 60°, and the angle M A B or A B N of the polygon equal to 120°. Conſequently half the flanked angle O G D or A G D, which is equal to the exceſs of O G H or O A B, half the angle of the polygon, above the angle *diminué* A D G or C D E, is equal to 45° 58′: and the whole flanked angle, or angle P G E of the baſtion, is equal to 91° 56′.

The capital A G of the baſtion, is found from the oblique-angled triangle A G D, by this analogy.

As the ſine of half the flanked angle A G D, which is =45° 58′
Is to the ſine of the angle *diminué* A D G=14° 2′,
So is the lengthened curtain A D, which is=100 toiſes,
To the capital A G of the baſtion, which is equal to about 33.73 toiſes.

And the raſant line or line of defence D G, is found from the ſame triangle by this analogy.

As the ſine of half the flanked angle A G D=45° 58′
Is to the ſine of the angle D A G=120°,
So is the lengthened curtain A D, which is=100 toiſes,
To the raſant line or line of defence D G, which is equal to about 120.46 toiſes, or $120\frac{1}{2}$ toiſes nearly.

But D E is equal to $\sqrt{\overline{CE}^2+\overline{CD}^2}=\sqrt{\overline{20}^2+\overline{80}^2}=4\sqrt{425}$ toiſes=to 82.86 toiſes nearly. Wherefore the face G E of the baſtion is equal to 37.6 toiſes nearly.

The gorge-line C Q is found from the iſoſceles triangle C A Q, by the following analogy.

As the ſine of the angle A C Q=half the angle of the centre
Is to the angle of the polygon C A Q,
So is the demi-gorge A C, which is = 20 toiſes,
To the gorge-line C Q, which in a hexagon, as this figure is ſuppoſed to be, is equal to about 34.64 toiſes.

The line O G being equal to about 153.73 toiſes, the exterior ſide G H, when A B is the ſide of a hexagon, will alſo be equal to about 153.73 toiſes. But G H is always determined by taking a fourth proportional to O A, A B, and O G.

The perpendicular diſtance K L of the interſection of the lines of defence, from the exterior ſide G H, is found by this analogy.

As radius
Is to the tangent of the angle *diminué* L G K=14° 2′,
So is G L or the half of G H, the exterior ſide,
To the perpendicular K L, which in the hexagon, as this figure is ſuppoſed to be, is equal to about 19.2 toiſes, falling ſhort of the flank C E by about 0.8 of a toiſe, or eight-tenths of a toiſe.

The Spaniards, who are rather partial than otherwiſe to obtuſe flanked angles, have no ſecond flank on the curtain, but always conſtruct their fortifications with a raſant, and never with a fichant line of defence, not minding whether the flanked angle or angle of the baſtion be acute, right, or obtuſe. Their mode of conſtruction, except as to the ſecond flanks, and the making of the flanked angle right, is the ſame with that of the Chevalier de Ville, above deſcribed, which being compounded of the Italian and Spaniſh methods, has on that account been called the compoſed draught, or the compoſed method of conſtruction.

Let A B (*Plate* VII. *fig.* 14.) be the ſide of a regular hexagon inſcribed in a circle, and equal to 160 toiſes. Set off from its extremities A and C on it A C, B D as demi-gorges, and each equal to an eighth part of A B, or to 20 toiſes. From the points C and D on right lines perpendicular to A B take C E, D F, as flanks equal each to 20 toiſes, or an eighth part of A B alſo. Take the curtains C I, D K, from the points C D, and A B, each equal to 40 toiſes, or a fourth part of the interior ſide A B; and from the points I, K, on right lines, drawn perpendicularly to A B inwards, take I L, K M, for the retired flanks, each equal to 20 toiſes, or the eighth part of the interior ſide. Join the points L, M, by drawing L M for the retired curtain. From the extremities L, M, thereof through the points K, I, draw the right lines L K, M I, which being produced, will paſs through the outward extremities E, F, of the flanks C E, D F, and will meet the lengthened radii O A, O B, in the points G, H, which will determine the ſaliant points of two of the baſtions. And a ſimilar operation continued quite round on the other ſides of the polygon, will complete the conſtruction.

As the foregoing figure is ſuppoſed to be a regular hexagon, the angle of the centre is equal to 60°, and that of the polygon to 120°. And as M L is to L I, as 40 to 20 or 2 to 1, the natural tangent of the angle *diminué* L M I, or M G H to unity, as radius is equal to $\frac{1}{2}$ or to 0.5000000, which is nearly equal to the natural tangent of 26° 34′. If this angle be taken from 60°, half the angle of the polygon, there will remain 33° 26′ for half the flanked angle, or half the angle of the baſtion. The flanked angle therefore, or the angle of the baſtion, is in a hexagon equal to 66° 52′.

Now the line G I is found from the oblique-angled triangle A G I, by this analogy.

As the ſine of 33° 26′, half the flanked angle, or A G I
Is to the ſine of the angle G A I=120°,
So is the line A I, which is equal to 60 toiſes

To the line G I, which is equal to 94.31 toiſes nearly.

And the capital A G of the baſtion is found from the ſame triangle by this analogy.

As the ſine of A G I, half the flanked angle = 33° 26′
Is to the ſine of the angle *diminué* A I G = 26° 34′,
So is the line A I, which is equal to 60 toiſes,
To the capital A G of the baſtion, which is equal to about 48.704 toiſes.

But the line I M is equal to $\sqrt{\overline{IL}^2+\overline{LM}^2}=\sqrt{20^2+40^2}=4\sqrt{125}=44.72$ toiſes nearly.

But E I is equal to I M. Wherefore G E, the face of the baſtion, being equal to G I − E I, is equal to about 49.59 toiſes, or 49.6 toiſes nearly.

The ſhort or little line of defence G M or H L, being equal to G I + I M, is equal to $\overline{94.31+44.72}$ toiſes, or 139 03 toiſes, or 139 toiſes nearly.

The lengthened radius O G, and conſequently the exterior ſide G H, when A B is the ſide of a hexagon, is equal to $\overline{160+44.72}$ toiſes, or to 204.72 toiſes.

The perpendicular diſtance of the interſection I, of the lines of defence, from the exterior ſide G H, is found by either of the two following analogies.

As radius
Is to the tangent of the angle *diminué* *i* G H = 26° 34′,
So is half the exterior ſide G H, or 102.36 toiſes,
To the perpendicular diſtance of *i* from the ſame.
Or, As radius
Is to the ſine of the angle *diminue* *i* G H = 26° 34′,
So is the little line of defence G M = 139 toiſes
To the perpendicular diſtance of the point *i* from G H, which is equal to about 62.166 toiſes.

This method was adopted for the purpoſe of conſtructing on a large front, and thereby leſſening the number of baſtions. And to keep the lines of defence G M, H L, within muſquet-ſhot, a curtain L M retired inwards, is made equal to a fourth part of the interior ſide A B, and oppoſite to the middle thereof. This manner of fortifying has been called the *ordre renforcé* or re-inforced order, concerning which ſeveral Italian and Spaniſh authors have written large treatiſes. Like moſt other writers on fortification, who have delivered different methods of conſtruction, they very abſurdly make their angle *diminué* invariably the ſame in all polygons, without aſſigning any good reaſon for doing ſo, drawn from the natures or properties of the polygons themſelves, the facility or difficulty of embracing them reſpectively, or from their relative degrees of capability of defence. In this method, the perpendicular diſtance of the interſection *i* of the lines of defence, from the exterior ſide G H, is more than thrice the length of the flank C E or D F.

Of Coehorn or Koehoorn's methods.

The famous Minno, baron of Koehoorn, who took many of the places, which the celebrated marſhal Vauban had fortified, publiſhed three methods of conſtruction, the firſt for a hexagon, the ſecond for a heptagon, and the third for an octagon. The publication of his treatiſe on fortification however took place before he had acquired that great experience, which juſtly procured him the reputation of being one of the firſt engineers, that has ever appeared in Europe; and the methods delivered in it are not reducible to practice. That he afterwards thought ſo himſelf is evident from the towns which he fortified. For if, after acquiring experience in the attack of places he had really been of opinion that the methods he had publiſhed, were capable of making ſuch a prodigious reſiſtance or defence as he endeavoured in his book on fortification to ſhew, that they were, it is a circumſtance difficult to be accounted for, that he never once thought of uſing them, when he had frequent opportunities of doing ſo. It ought alſo to be remembered, that his ſyſtem of fortification was publiſhed before the method of firing *en ricochet* was either practiſed or invented.

In his firſt method the works occupy twice as much ground as they do in Mr. Vauban's, and being entirely of earth, low, and liable to be eaſily ſurpriſed, would require thrice as many men, at leaſt, for their defence. His ſecond and third methods are, in fact, impracticable, as the fortification in each of them takes up five times as much ground as the town or place it ſurrounds.

This being the caſe, we will juſt give a general deſcription of them. In all the three he begins inwards and conſtructs outwards. The firſt he applies to a hexagon and ſuppoſes the ſurface of the water to be only about four feet lower than the level ground. In this he conſtructs from an interior ſide of 150 toiſes, from the extremities of which he ſets off on the ſame 39 toiſes for each of the demi-gorges and 80 toiſes on the lengthened radii of the hexagon for the capital of each of the baſtions. He thus leaves 72 toiſes for the length of his curtain. From the extremities of the interior ſide he takes, on the lengthened radii reſpectively, 40 toiſes for the points of interſection of the higher faces of the baſtions, which are alſo equal each to 40 toiſes, and parallel to the lower faces that are in the lines of defence. The ſpace between the lower and higher faces of the baſtions is a dry ditch, the bottom of which is only about ſix inches above the level of the water in a wet ditch. Behind the lower parapet there is a banquette of three feet and a rampart of five, and under this rampart is a ſtone gallery, that runs from one end of it to the other, and is divided into ſeveral apartments, which are ſhut with doors. There is alſo a gallery, which goes from the ſaliant angle formed by the lower faces to that formed by the higher with loop-holes at ſmall diſtances from one another, looking into the dry ditch. There are likewiſe rows of paliſades placed parallel to the higher face at the diſtance of four toiſes from them.

The great ditch is 24 toiſes broad, and its counterſcarp is parallel to the lower faces of the baſtions. The demi-gorges of the ravelin are each equal to 29 toiſes, and the faces each to 45 toiſes. The dry ditch between the lower and upper faces of it is 16 toiſes broad. The rampart is 28 feet broad, the banquette three, and the parapet 20. The lower faces are parallel to the higher ones.

The angle *diminué*, or the angle formed by the exterior ſide, and either line of defence, is in this method equal to 24° 38′ 48″.

His ſecond method he applies to a heptagon, and ſuppoſes the level of the ground to be only about three feet above that of the ſurface of the water. In it he conſtructs outwards from an interior ſide of 126 toiſes in length, from the extremities of which he takes on the ſame 30 toiſes for each of the demi-gorges. On the lengthened radii of the heptagon he ſets off 72 toiſes for the capital of each of the baſtions, at the extremities of which he draws right lines forming with the ſaid capitals angles each of 40°, and on theſe lines he ſets off 66 toiſes for the faces of the baſtions reſpectively. From the ſaliant angles of the baſtions as centres with radii equal to the diſtance from the ſame to the extremities of the demi-gorges 30 toiſes diſtant from thoſe of the interior ſides he deſcribes arcs, in which he ſets off reſpectively chords equal each to 30 toiſes, and on theſe chords deſcribes the mean flanks which are arcs of 60°.

The outline of his higher flank is 13 toiſes diſtant from that of the mean, and this flank is an arc deſcribed from the ſame centre, that the mean flank is deſcribed from, having its chord equal to 40 toiſes.

The dry ditch round the body of the place is 20 toiſes broad before the faces of the baſtions, to which its counterſcarp is parallel. There is a wet ditch before his tenailles 10 toiſes broad with two bridges at each end near the orillons, the one of which leads directly acroſs it and the other along the face of the baſtion.

The ſaliant angle of the ravelin is 125 toiſes diſtant from the curtain of the body of the place and is of 70 degrees of magnitude. The faces are each 50 toiſes long, and the faces of the redoubt in it are 16 toiſes diſtant from thoſe of the ravelin, and each 14 toiſes long. The wet ditch before the lower faces of the ravelin is 24 toiſes broad, and the work beyond that ditch, which he calls the ſecond counterſcarp, is 20, and parallel to the ditch.

The flanked angle or angle of the baſtion in this method is equal to 80°, and the angle *diminué* or the angle formed by the exterior ſide and either line of defence is equal to twenty-four degrees and two ſevenths. In his firſt method the angle of the baſtion or flanked angle is equal to 70° 4′ 24″.

He applies his third method to an octagon, of which the ſide is equal to 110 toiſes, and from which he conſtructs outwards; from its extremities he ſets off 21 toiſes for each of the demi-gorges. On the lengthened radii, or radii of the octagon produced, he ſets off from the ſaid extremities of the interior ſide 64 toiſes for the capitals of each of the baſtions, the faces of which he ſuppoſes to be each equal to 54 toiſes, and the ſaliant or flanked angle equal to 85°. He thus makes his curtain equal to 68 toiſes.

In his firſt and ſecond methods he has three flanks including that of the tenaille. But in this he has only two, the lower of which is determined or found by deſcribing an arc through the extremity of the tenaille from the ſaliant angle of the oppoſite baſtion as centre and ſetting off from the ſaid extremity in the ſaid arc a chord equal to 20 toiſes, on which an arc of 60 degrees is deſcribed for the flank. The upper flank is deſcribed from the ſame centre, that the lower one is deſcribed from through one extremity of the curtain, and its chord is equal to 30 toiſes.

The wet ditch before the body of the place is 20 toiſes broad, and its counterſcarp is parallel to the faces of the baſtions.

The capital of the detached baſtion is equal to 100 toiſes, its faces are directed towards the ſaliant angles of the inner baſtions. The dry ditch between the lower and higher faces of the detached baſtions is 20 toiſes broad; and the higher faces are parallel to the lower, and each of them 31 toiſes long. The ditch before the detached baſtions 24 toiſes broad. It is evident, that in this third method of Coehorn the angle *diminué* or the angle formed by the exterior ſide and either line of defence is equal to 25 degrees. For ſince the angle of the centre in an octagon is equal to 45°, that of the octagon is equal to 135°, from which, if the flanked angle, that by the conſtruction is equal to 85°, be taken, we get 50° for the double of the angle *diminué*, which is of courſe equal to 25°.

Of Mr. Belidor's methods.

This author delivers three methods of conſtruction, the firſt he applies to an octagon, of which the ſide is equal to 200 toiſes. In the three he begins outwards and conſtructs inwards. In the firſt he makes the perpendicular to the exterior ſide equal to 50 toiſes, the faces of his baſtion equal each to 70 toiſes, and he finds his flanks in the ſame way with Mr. Vauban in in his firſt method. He makes his baſtion with flanks equal each to about 26 toiſes. On the line joining the extremities of theſe flanks he conſtructs inwards, erecting a perpendicular to the middle thereof equal to 13 toiſes, through the inner extremity of defence and takes on them the faces equal each to 22 toiſes. The parts of the lines of defence from their interſection to the points where they terminate the flanks, are each equal to 14 toiſes. The dry ditch before this front is 10 toiſes broad at the inner extremities of the baſtion, and its counterſcarp produced terminates at the oppoſite ſhoulders. He connects the flanks of the baſtions with the curtains or lines joining the faces of the interior front by means of works in the form of arcs called ram's-horns, which are deſcribed from the middle points of the ſaid faces as centres with a radius of 25 toiſes. The ſaliant angle of the redoubt in his baſtion is in the interſection of the two adjoining curtains produced, and the faces of it terminate on thoſe of the inner front within three toiſes of the *epaules* or ſhoulders. The ditch before it is 3 toiſes broad. It has a ſtone wall in the faces from three to four feet thick with loopholes. Mr. Belidor adds no outworks to this method of conſtruction, which has certainly the advantage of all thoſe with detached baſtions. The retrenchments within are capable of a good defence, but occupy too much ground, particularly the ditches, that might be better diſpoſed of. The flanks of ſuch large baſtions as his are too ſmall. The great ditches are too large, being 20 toiſes broad at the ſaliant angles of the baſtions with its counterſcarp directed towards their ſhoulders.

In this method his angle *diminué* or the angle formed by the exterior ſide and either line of defence is equal to 26° 33′ 54″, and of courſe the angle of his baſtion or the flanked angle, as the conſtruction is applied to an octagon, is equal to 81° 52′ 12″.

His ſecond method of conſtruction he alſo applies to an octagon, of which the exterior ſide is equal to 200 toiſes, the perpendicular to which, from the middle point thereof, he makes equal to 55 toiſes. The faces of his baſtions, which are detached, are each equal to 70 toiſes, as in his firſt method. And the flanks as well as in the firſt are found in the ſame way as Mr. Vauban's.

The right line, that paſſes through the inner extremities of his baſtion, ſerves as an exterior ſide for conſtructing the inward polygon on, the perpendicular to which, at the middle point thereof, is equal to 5 toiſes, through the inner extremity of which the lines of defence are drawn. On theſe the faces are ſet off, each equal to 24 toiſes; and the flanks are chords of arcs deſcribed from the oppoſite ſhoulders of the detached baſtions as centres.

The inward polygon is in fact nothing elſe than a ſtrong wall, behind the curtain of which, and at the diſtance of about 18 feet from it, there is an epaulement or a parapet of earth 3 toiſes thick. And within the baſtions there are cavaliers, of which the fronts are circular arcs, deſcribed with a radius of from 23 to 24 toiſes. Their flanks are each equal to 7 toiſes, and their gorges to 32 toiſes each.

The counterſcarp of the ditch before this inner polygon is diſtant from it at the ſaliant angles, and is parallel to the curtain.

His tenailles, called ram's-horns, touch the outer lines of defence within three toiſes of the *epaules* or ſhoulders of the detached baſtions, and are ſo deſcribed as to meet the ſaid lines of defence inwards, beyond their interſection in the points, where the counterſcarp of the inner ditch meets the ſame.

The outline of the curtain between the ram's-horns is 9 toiſes beyond or without the inner ditch.

The exterior line, from the retrenchment within his detached baſtion is conſtructed, runs acroſs the ſame, and meets the faces thereof about 20 toiſes from the *epaules*, or ſhoulders, the perpendicular to which line at the middle point thereof is equal to 17 toiſes. Through the inner extremity of this perpendicular the lines of defence for the retrenchment are drawn. On theſe lines, from the faces of the baſtion, thoſe of the retrenchment are ſet off equal each to 20 toiſes. The chord, on which the orillon is deſcribed, is equal to 5 toiſes, as is alſo that on which the retired flank is deſcribed. Both are made according to Mr. Vauban's method. The circular curtain of this retrenchment, and the rounded part of the ditch adjoining it, are deſcribed from the ſaliant angle of the inner conſtruction next to it, with a radius of 25 toiſes. The great ditch before the ſaliant angles of the detached baſtions is 20 toiſes broad, and as it is ſuppoſed to be dry, Mr. Belidor made a *caponiere* from the curtain between the ram's-horns to the ravelin of about 18 or 20 feet wide, the parapets of which he made terminate on both ſides in a ſlope or glacis.

The capital of the ravelin he makes equal to 66 toiſes, and that of the redoubt within it equal to 30 toiſes. The faces of the ravelins are directed towards thoſe of the retrenchments within the detached baſtions, and thoſe of the redoubt within it to the ſhoulders of the ſaid baſtions. The batteries in the ravelin are retired 8 toiſes back from the faces of it. The ditch in front of the ravelin is 12 toiſes, and the breadth of that before the redoubt is equal to 7 toiſes.

The demi-gorges of the *lunettes* are each equal to 25 toiſes, and their faces are perpendicularly directed towards thoſe of the ravelin and detached baſtions. The ditch before them is 8 toiſes wide, and the batteries in them are retired 8 toiſes back from their faces, and are each of them 15 toiſes long. The covert-way is 6 toiſes broad.

In this method the angle *diminué*, or the angle formed by the exterior ſide and either line of defence, is equal to 28° 48′ 39″; and as the conſtruction is applied to an octagon, the angle of the baſtion, or the flanked angle, is of courſe equal to 77° 22′ 42″.

It is manifeſt that in this conſtruction the perpendicular to the exterior ſide, or of the great polygon, is much longer than it ought to be, ſince it exceeds the true perpendicular belonging to a polygon of 30 ſides. For the angle *diminué*, which it gives, is greater than the true angle *diminué* belonging to a polygon of 30 ſides, by upwards of one degree. And the angle of the baſtion, or flanked angle, falls ſhort of the real flanked angle in a polygon of 30 ſides, by not leſs than 33°. The baſtions are thereby made by far too large and extenſive. The great ditch appears alſo to be too wide, as the excavation of it will furniſh more earth than what is wanted for raiſing the ramparts. The works indeed, taken altogether, are too expenſive to be erected. For it would require almoſt a whole army to defend them, beſides ſuch a prodigious quantity of ſtores and ammunition, as cannot be allotted for the ſervice or defence of any one place.

Mr. Belidor applies his third method of conſtruction, as he does his firſt and ſecond, to an octagon, of which the exterior ſide is equal to 200 toiſes. But he makes the perpendicular to it at the middle point thereof equal only to 40 toiſes, which is very nearly indeed equal to the true perpendicular of an enneagon of the ſame exterior, and therefore comes nearer to the true perpendicular of an octagon than that which has been deſcribed for it by any other writer on fortification. On this account we will give the conſtruction of part of the body of the place on an octagon according to this method.

Let AB (*Plate* VIII. *fig.* 15.) be equal to 200 toiſes inſide of an octagon. Biſect AB in the point C, and draw CD perpendicular thereto. From C to D ſet off to D, equal to 40 toiſes, and from the extremities A, and B, of the exterior ſide AB, through the point D, draw the lines of defence. On them take AE and BF for the faces of the baſtions, equal each to 55 toiſes. The parts D*n*, D*r*, between the interſection, D, of the lines of defence, and the broken parts of the curtain, take each equal to 30 toiſes, and the length of each of the broken parts remains equal to 25 toiſes. The orillon is equal to 9 toiſes, and is part of a flank found according to Mr. Vauban's method. The flanks are retired 8 toiſes, and are arcs of 60° each. The outlines of the ram's-horns are 13 toiſes diſtant from one another. The paſſages at their extremities are each 3 toiſes wide. The outermoſt or loweſt is deſcribed with a radius of 30 toiſes, and the other is deſcribed from the ſame centre. By making the ſame conſtruction on two other ſides of the octagon, the poſitions of the other faces, AG, BH, of the baſtions is determined as well as the magnitude of the ſaliant angle of each. He places cavaliers in the gorges of the baſtions.

The capital of his ravelin is 44 toiſes, the demi-gorges of it are each equal to 31 toiſes, and its flanks, which are directed towards the ſhoulders of the baſtions, are each of them equal to 9 toiſes. The ditch before the ravelin is 10 toiſes wide, and the covert-way is 6 toiſes broad.

The glacis before the ſaliant angles of the baſtions is 15 toiſes broad. The demi-gorges of the places of arms are each equal to 26 toiſes, and thoſe of the redoubts or ſtone walls within them to 20. And the faces are parallel to the oppoſite demi-gorges. He makes arrows and detached redoubts after the manner of Mr. Vauban, but gives flanks to his arrows, which are parallel to the paſſages of 10 toiſes wide, that lead to them.

In this his third method of conſtruction, the angle *diminué*, or the angle BAD, or ABD, formed by the exterior ſide and either line of defence, is equal to 21° 48′ 5″, which differs from the true angle *diminué* of an enneagon by about 3 minutes only. And as it is applied to an octagon, the angle of the baſtion, or the flanked angle, is of courſe equal to 91° 23′ 50″.

It muſt be allowed that this conſtruction for the body of the place is good. The ram's-horns are unqueſtionably well contrived, and are much preferable to tenailles, as they cannot be enfiladed from any one place, as they reſiſt better, by their bending or curvature outwards, the enemies' batteries, and render the flanks much ſuperior to any batteries that the beſiegers can erect againſt them. Like a mere conſtructor on paper, however, he makes ſo many outworks, that they occupy a vaſt extent of ground, cannot be defended but by a very numerous garriſon, and uncommonly large ſupply of ammunition, artillery, and proviſions, and cannot be erected but at an immenſe expence.

The learned and ingenious Mr. Ozanam has given four methods of conſtruction, in all of which he begins inwards, and fortifies outwards, from an interior ſide of 120 toiſes, and at the ſame time places or takes his flanks on right lines drawn from the centre of the polygon through the extremities of the demi-gorges ſet off on the interior ſides.

In his firſt method he makes each demi-gorge equal to as many toiſes more than 20 as the polygon to be fortified has ſides. In the ſquare the demi-gorge is therefore equal to 24 toiſes, in the pentagon to 25, in the hexagon to 26, in the heptagon to 27, and ſo on to the decagon, in which the demi-gorge being equal by this rule to 30 toiſes, he makes it continue of this length in all higher polygons. He makes each flank equal to four times as many toiſes as the number of the ſides of the polygon, allowing 16 toiſes for it in the ſquare, 20 in the pentagon, 24 in the hexagon, 28 in the heptagon, and ſo on to the decagon, where the flank being by this rule equal to 40 toiſes, continues of that length in all higher polygons.

The angle formed by right lines from the ſaliant angle, and either ſhoulder or *epaule* of his baſtion, he calls the *flank-forming angle*.

The following is a table of the lines and angles of a fortified polygon, from the ſquare to the dodecagon, according to his firſt method of conſtruction, the inward or interior ſide being equal to 120 toiſes.

Polygons	Sides. 4	5	6	7	8	9	10	11	12
Angle of the centre	90° 0′	72° 0′	60° 0′	51° 26′	45° 0′	40° 0′	36° 0′	32° 44′	30° 0′
Angle of the polygon	90° 0′	108° 0′	120° 0′	128° 34′	135° 0′	140° 0′	144° 0′	147° 16′	150° 0′
Flank-forming angle	14° 2′	13° 1′	11° 53′	10° 36′	10° 2′	9° 21′	8° 44′	7° 50′	7° 22′
Angle of the flank	120° 58′	112° 59′	108° 7′	105° 7′	102° 28′	100° 39′	99° 16′	98° 32′	97° 58′
Angle diminué	9° 42′	13° 19′	16° 49′	20° 14′	23° 46′	27° 16′	30° 43′	30° 49′	31° 16′
Angle of the epaule	130° 40′	126° 18′	124° 56′	125° 21′	126° 14′	127° 55′	129° 59′	129° 21′	128° 54′
Flanking angle.	160° 36′	153° 22′	146° 22′	139° 32′	132° 28′	125° 28′	118° 34′	118° 22′	117° 28′
Flanked angle	70° 36′	81° 22′	86° 22′	88° 6′	87° 28′	85° 28′	82° 34′	85° 38′	87° 28′
	Toiſes. Feet.								
Demi-gorge	24 0	25 0	26 0	27 0	28 0	29 0	30 0	30 0	30 0
Curtain	72 0	70 0	68 0	66 0	64 0	62 0	60 0	60 0	60 0
Flank	16 0	20 0	24 0	28 0	32 0	36 0	40 0	40 0	40 0
Great line of defence	117 3	117 5	119 0	120 3	122 5	126 0	129 0	127 0	125 4
Face of the baſtion	36 1	37 5	40 1	42 2	45 2	48 5	52 3	50 0	49 1
Capital of the baſtion	28 0	33 3	39 4	46 1	53 4	61 2	69 4	67 5	67 3
Little radius	84 5	102 1	120 0	138 2	156 5	175 2	194 1	217 5	231 5

The following is this conſtruction on a hexagon, of which the exterior ſide is equal to 120 toiſes.

Let A B C E F D (*fig.* 16.) be a regular hexagon, inſcribed in a circle, of which the radius, A O, is equal to 120 toiſes. From the extremities A and B, ſet off A L, B M, for demi-gorges, equal each to 20+6 or 26 toiſes. In like manner ſet off A P, C Q; B *a*, D *b*; C T, E V; E *c*, F Y; F Z, D X; equal each to 26 toiſes. From the centre O, through the points, L, M, *a*, *b*, P, Q, T, V, *c*, Y, Z, X, draw the right lines O I, O H, O *d*, O *e*, O N, O S, O *m*, O *l*, O *k*, O *h*, O *g*, O *f*, and take I L, K M, *a d*, *b e*, Q S, T *m*, V *l*, *c k*, Y *h*, Z *g*, X *f*, equal each to 6 × 4, or 24 toiſes. From the points L, M, through the points K, I, draw right lines to meet the radii O B, O A, lengthened or produced in the points H, G. From the points *a*, *b*, through the points *e*, *d*, draw right lines in like manner, and ſo on round the figure. This operation will determine the ſaliant angles of the baſtions, and all the parts of the conſtruction.

The calculation of the different lines and angles in this conſtruction may be made in the following manner.

Since A B is equal to 120 toiſes, if from it there be taken the demi-gorge A L, or B M, which is equal to 26 toiſes, there will remain 94 toiſes for the lengthened curtain, A M, or B L, from which, if 26 toiſes be taken, we get the curtain L M, equal 68 toiſes. But as this figure is a hexagon, the angle of the centre is equal to 60°, and the angle of the polygon to 120°. The little radius is alſo of courſe equal to 120 toiſes.

The angle, I L M, of the flank, or its equal, A L O, is found by means of the following analogy.

As the ſum of the ſides O L + A L = 146 toiſes,

Is to their difference O L − A L = 94 toiſes,

So is the tangent of half the ſum of the angles A L O, A O L = 60°,

To the tangent of half their difference, which is equal to about 48° 7′. This angle added to 60° gives 108° 7′ for the angle I L M of the flank, and taken from 60° leaves 11° 53′ for the flank-forming angle A O L, or A O I.

In like manner the angle *diminué*, L M I, or M G H, is found from the oblique-angled triangle I L M, by means of this analogy.

As the ſum of the ſides L M, L I, which is equal to 92 toiſes,

Is to their difference, which is equal to 44 toiſes,

So is the tangent of half the ſum of the angles L I M, L M I = 35° $56\frac{1}{2}'$,

To the tangent of half their difference, which is equal to about 19° 77′. This angle, taken from 35° $56\frac{1}{2}'$, leaves about 16° 49′ for the angle *diminué* L M I, or M G H, and added to 35° $56\frac{1}{2}'$ gives about 55° 4′ for the angle L I M; conſequently the angle G I L of the epaule is equal to 124° 56′. And if 33° 38′, which is equal to twice the angle *diminué*, be taken from 180° we get 146° 24′ for the flanking angle G *i* H, or I *i* K. Double the angle *diminué*, or 33° 38′, taken from 120°, the angle of the polygon leaves 86° 22′ for the flanked angle, or angle of the baſtion.

The angle *diminué*, 16° 49′, taken from 108° 7′ the angle of the flank leaves 91° 18′ for I L K, or I L H, the inner or inward flanking angle.

The line of defence, G M, is found from the oblique-angled triangle, A G M, by means of the following analogy.

As the ſine of A G M, half the flanked angle, or 43° 11′,

Is to the ſine of the angle of the gorge, G A M = 120°,

So is the lengthened curtain A M = 94 toiſes,

To the line of defence G M, which is equal to about 119 toiſes.

And the capital, A G, of the baſtion, is found from the ſame triangle, by means of this analogy.

As the ſine of A G M, half the flanked angle, or 43° 11′,

Is to the ſine of the angle *diminué* = 16° 49′.

So is the lengthened curtain A M = 94 toiſes,

To the capital A G of the baſtion, which is equal to about $39\frac{2}{3}$ toiſes, to which, if we add the little radius O A, which is equal to 120 toiſes, we get $159\frac{2}{3}$ toiſes, for the great radius O G, to which the exterior ſide, G H, is equal, as the figure is a hexagon. And in every polygon, the exterior ſide, G H, is a fourth proportional to the little radius O A, the great radius O G, and the interior ſide A B.

The face, G I, of the baſtion, is determined by finding the line I M from the oblique-angled triangle, I L M, by this analogy.

As the ſine of the angle *diminué* I M L = 16° 49′,

Is to the ſine of the angle I L M of the flank = 108° 7″,

So is the flank I L, which is equal to 24 toiſes,

To the line I M, which is equal to about $79\frac{5}{6}$ toiſes, and when taken from I M, the line of defence, leaves about $40\frac{1}{6}$ toiſes for G I, the face of the baſtion.

The angle A O B is called the angle of the centre.

The angle B A C is called the angle of the polygon.

The angle N G I is called the flanked angle, or angle of the baſtion.

The angle I *i* K, or G *i* H, is called the outward flanking angle.

The angle G I L is called the angle of the epaule or ſhoulder.

The angle I L M is called the angle of the flank.

The angle I M L, or M G H, is called the angle *diminué*.

The angle A O L is called the flank-forming angle.

P N G I L is called a baſtion.

A P, or A L, is called the demi-gorge of the baſtion.

The line joining the points P, L, is called the gorge of the baſtion.

The angle I L K, or I L H, formed by the flank I L and the line of defence L H is called the inner flanking angle.

A B is called the inward or interior ſide.

G H is called the outward or exterior ſide.

O A is called the little radius.

O G is called the great radius.

I L, or K M, is called a flank.

L M is called the curtain.

A M, or L B, is called the lengthened curtain.

G M, or L H, is called a line of defence.

A G is called the capital line, or capital of the baſtion.

A I, or H K, is called the face, or *pan* of the baſtion.

The flank I L is called right flank, when it makes a right angle with the curtain; oblique flank when it makes an oblique angle with the ſame; and acute flank when it makes an acute angle with the curtain; as it does by Errard's method in figures up to the octagon. When the orillon is rounded or formed by the arc of a circle, it is called a round orillon, and when it is rectilinear, or formed by the face of the baſtion, produced a few toiſes beyond the *epaule*, and a right line drawn from the extremity of the ſaid prolongation, either parallel to the flank, or nearly ſo, it is called a ſquare orillon. It is made for the purpoſe of covering part of the flank, which for that reaſon, or in order to be the more effectually covered, is taken a few toiſes inwards from the flank itſelf towards the centre of the baſtion, and is generally made in an arc of a circle, though it would be better in a right line, or on the chord of an arc. It is on this account called the *retired*, or *covered flank*, and ſometimes the *caſemate*, and *place-baſſe*. And its depth, or enfoncement on the line of defence, produced beyond its interſection with the curtain, as well as its diſtance from the outſide of the orillon, is called the *retirade* or *retrenchment of the flank*, or the *platform of the caſemate*.

The line Q S is called flank, becauſe it defends the face G N of the oppoſite baſtion. For, in fortification, *to flank* has the ſame meaning or ſignification with the phraſe *to defend*. When the line G Q is not compoſed of the face G N of the baſtion, and a prolongation thereof to the angle Q of the flank, it is called *flank-fichant*, becauſe a muſketeer, at its extremity Q, can fire, or *ficher*, as the French term it, at or againſt any part of the face G N. Hence the line Q G, drawn from the ſaid extremity Q of the flank, is called the *fichant-line of defence*, and ſometimes only the *fichant-line*. It is alſo called the *great line of defence*. But when the face, G N, of the baſtion produced, meets the curtain Q P, in any point, R, between the points Q and P, or in any point R nearer to the ſaid baſtion, the line G R is called the *raſant-line of defence*, or ſimply the *raſant-line*, and alſo the *little line of defence*, being ſhorter than the line G Q, becauſe a muſketeer cannot from the point R fire at or againſt any part of G N, the face of the baſtion, but can only raſe or fire along it. The part Q R of the curtain intercepted between the lines G Q, G R, is called the *ſecond flank*, as alſo the *fire* or *the curtain*, becauſe from every point in it, except the extremity R, one may ſhoot or fire againſt every part of the face G N. Second flanks are not always, nor indeed frequently, made. And when there are none, there are no *fichant lines*, but only *raſant-lines of defence*, in which caſe the flanks are called *raſant flanks*, becauſe from their extremities, that join the curtains, one can only raſe or fire along the faces of the oppoſite baſtions, but from any intermediate points between thoſe extremities and the *epaules*, he can fire at or againſt the ſaid faces. The flanks form the principal defences, ſince an enemy cannot, whilſt they remain entire, approach the body of the place. And they are, for that very reaſon, the parts which he firſt endeavours to deſtroy, in order to facilitate his paſſage of the great ditch.

The angle ILM, which the flank IL makes with the curtain LM, is called the *angle of the flank*, and the angle GIL, which the flank IL forms with the face GI of the baſtions, is called the *angle of the epaule*, or ſimply the *epaule*, from which comes the word *epauler*, to cover on one ſide, or to cover the flank or the ſhoulder of the beſieged in ſuch a manner, that he cannot be ſeen or diſcovered on that ſide from without. The face GI, which thus covers the *epaules* or ſhoulders of thoſe who aſſiſt in defending the place in the flank IL, is therefore called *epaulement*. The point or angle A, of the inward or interior polygon, is called the centre of the baſtion.

When the flank, IL, is on a right line, drawn from the epaule I, to the centre O of the polygon, as it is in all his four methods of conſtruction, it forms, when produced to the ſaid centre O, an angle AOL, which is called the *flank-forming angle*. The angle IGN, which the two faces GI, GN, form at the point G of the baſtion, is called the flanked angle, or angle of the baſtion, becauſe it is flanked or defended by the two oppoſite flanks QS, MK. The right line GH, drawn from one flanked angle to another, and which marks the diſtance between them, is called the *baſe-line*, and the ſide of the outward or exterior polygon, which in regular conſtruction is always parallel to AB, the correſponding ſide of the inward or interior polygon. A re-entering angle is that which retires inwards; and in terms of fortification it is called a *tenaille-angle*, or ſimply a *tenaille*. And ſuch of them as are formed by the meeting or interſection of two raſant lines, making an obtuſe angle, are called *flanking angles*, as for inſtance the angle G*i*H; and the lines G*i*, H*i*, forming it, are alſo called *tenailles*. The angle G*i*H is alſo called the *outward flanking angle*, to diſtinguiſh it from the angle ILH, formed by the flank IL, and the raſant line GL, when the flank is raſant, which is called the *inward*, or *inner flanking angle*; or from the angle GRQ, when there is a ſecond flank RQ, which is alſo called an *inward flanking angle*.

The raſant lines, GM, HL, always make acute angles with the curtain LM, either of which, as IML or GML, is called the *angle diminué*, or *angle diminiſhed*, and is equal to the angle MGH, which GM forms with the baſe-line, or exterior ſide GH. The angle GAL, formed by the capital AG and the demi-gorge AL, is called the *gorge-angle*, or angle of the gorge, and is always equal to the exceſs of 180° above half the angle of the polygon OAB; which half angle is called the *baſe-angle*.

In his ſecond method of fortifying or conſtructing, he ſuppoſes the demi-gorges to be the ſame as in his firſt method: but inſtead of making each flank equal, as in it, to four times as many toiſes as the number of the ſides of the figure or polygon, he, in this, makes each flank equal to 10 toiſes, together with twice as many more as the figure or polygon has ſides. He thus allows 18 toiſes for each flank in the ſquare; 20 for each in the pentagon; 22 in the hexagon; 24 in the heptagon; 26 in the octagon; 28 in the enneagon; and 30 in the decagon, in which the flank and demi-gorge being equal to each other, and to 30 toiſes reſpectively, he makes them continue ſo in all higher polygons.

But as it happens by this method of conſtruction, that in the octagon, and all the higher polygons, the flanked angle or angle of the baſtion becomes obtuſe, in order to limit it to a right angle, he deſcribes on a right line, joining the epaules or outer extremities of the flanks of each baſtion, a ſemicircle, which occaſions a ſecond flank upon the curtain, and two lines of defence, one raſant and the other fichant.

The calculation of the principal lines and angles in this conſtruction is eaſily made.

In his third method of conſtruction he makes his demi-gorges, as in the ſecond, of the ſame length as in the firſt, and his flanks of the ſame length as in the ſecond: but inſtead of limiting the flanked angle or angle of the baſtion to a right one, by ſuppoſing a ſemicircle to be deſcribed on a right line, joining the two epaules, he ſuppoſes it to remain always acute, by making the capital AG equal to the gorge-line PL.

The calculation of the principal lines and angles is eaſily made on this ſuppoſition.

In his fourth method he has no ſecond flanks, but makes all the defences raſant. He conſiders this method as more general than the three foregoing ones, which it certainly is, ſince it does not limit the lengths either of the demi-gorges or of the flanks, which, in this as well as in the others, are always on right lines, drawn from the centre of the polygon, through the extremities of the demi-gorges. And although the demi-gorges become greater with the number of the ſides of the polygon, they increaſe ſo ſlowly, that in one of 60 ſides the demi-gorge is only equal to about $37\frac{1}{2}$ toiſes. The following is his conſtruction for this method.

From the centre O of the polygon or figure, draw a right line perpendicular to the inward or interior ſide AB. Divide this perpendicular into ſuch a number of parts, as exceeds the number of the ſides of the figure or polygon by unity. Set off two of thoſe parts from each extremity of the inward or interior ſide, which is always ſuppoſed to be equal to 120 toiſes for each demi-gorge, and take three of them from the ſaid extremities on the little radii produced for the capital of each baſtion. Then, from the outer extremities G, H, of theſe capitals, which are the points of the baſtions, draw right lines to the points M, L, where right lines, drawn from the centre through the extremities M, L, of the demi-gorges, interſect the interior ſide. And theſe raſant lines, ſo drawn, will determine both the faces GI, HK, and the flanks IL, KM.

By this conſtruction, which is very ſimple and eaſy, the flanked angle or angle of the baſtion begins to become obtuſe in the enneagon, where it is equal to about 92° 6′, and grows more and more ſo in the higher polygons. This angle, however, increaſes but ſlowly, or at the rate of about one degree in each ſucceſſive polygon, amounting in the dodecagon to about 96° 26′.

The calculation of the principal lines and angles, in this conſtruction, is eaſily made in the following manner.

The perpendicular, from the centre O of the polygon to the inward or interior ſide AB, is found by this analogy.

As radius

Is to the tangent of the angle $OAB = 60°$,

So is half the interior ſide AB, or 60 toiſes,

To the perpendicular from O to AB, which is equal to about 104 toiſes. Wherefore the gorge AL being, by this conſtruction, equal to two-ſevenths of this perpendicular, is equal to about $29\frac{2}{3}$ toiſes; and the capital AG, being equal to three-ſevenths of it, is equal to about $44\frac{1}{2}$ toiſes. The lengthened curtain AM is conſequently equal to about $90\frac{1}{3}$ toiſes. Wherefore the angle *diminué* AMG, or IML, is eaſily found from the oblique-angled triangle AMG, by this analogy.

As the ſum of the ſides AM, AG, which is equal to $134\frac{5}{6}$ toiſes,

Is to their difference, which is equal to $45\frac{5}{6}$ toiſes, So is the tangent of half the angle OAM, or 30°,

To the tangent of half the difference of the angles AGM, AMG, which is equal to about 11° 6′. Conſequently the angle AGM, or half the flanked angle, is equal to about 41° 6′, and the angle *diminué* LMI to about 18° 54′. Wherefore the flanked angle, or ſaliant angle of the baſtion, is equal to about 82° 12′, to which adding the angle of the centre, or 60°, we get the flanking angle G*i*H, equal to about 142° 12′.

The angle ILM, in this conſtruction, is obtained by means of the following analogy.

As the ſum of the perpendicular from O to AB and half LM, or $134\frac{1}{3}$ toiſes,

Is to their difference, which is equal to $74\frac{2}{3}$ toiſes, or as 403 to 224,

So is the tangent of 45°, which is equal to radius,

To the tangent of 28° 42′, which added to 45°, gives 73° 42′ for the angle OLM, and conſequently 106° 18′ for the angle ALO, or its equal ILM, the angle of the flank; to which if the angle *diminué* LMI = 18° 54′ be added, we get the angle GIL of the epaule, equal to 125° 12′. And if from the angle OLM there be taken the angle OAB, or half the angle of the hexagon, we get 13° 42′ for the flank-forming angle AOL.

The flank IL is found from the triangle ILM by this analogy.

As the ſine of the angle LIM, which is equal to about 54° 48′,

Is to the ſine of the angle *diminué* IML, which is equal to about 18° 54′,

So is the curtain LM, which is equal to about $60\frac{2}{3}$ toiſes,

To the flank IL, which is equal to about 24 toiſes.

And the perpendicular diſtance of the interſection *i* of the lines of defence, from the exterior ſide GH, is found by this analogy.

As radius

Is to the tangent of the angle *diminué* *i*GH = 18° 54′,

So is the half of the exterior ſide GH, which is equal to about 82.25 toiſes,

To the perpendicular diſtance of *i* from GH, which is equal to about 28.1605 or 28.16 toiſes nearly, exceeding the flank by 4.16 toiſes.

Mr. Muller, in his "Elements of Fortification," has delivered what he is pleaſed to call a new conſtruction. It differs, however, from Mr. Vauban's firſt method only in the following particulars.

1ſt. Inſtead of ſuppoſing, like Vauban, each flank to be the chord of an arc deſcribed from the ſhoulder or *epaule* of the oppoſite baſtion as centre, he ſuppoſes it to be the chord of an arc deſcribed from the interſection of the line of defence and counterſcarp produced.

2dly. He makes his retired flanks rectilinear, inſtead of making them in circular arcs.

3dly. Inſtead of uſing Vauban's tenailles before the flanks, he places ram's-horns before them.

4thly. He makes his orillon 5 toiſes long only, inſtead of 9, like Mr. Vauban.

Laſtly. Inſtead of drawing the right line, which terminates the retired flank from the ſaliant angle of the oppoſite baſtion, like Mr. Vauban, he draws it from a point on the face 5, or rather 10, toiſes within the ſaid angle.

For, in his conſtruction of this method, he begins, like Vauban, in his firſt method outwards, and conſtructs inwards. Like him he alſo ſuppoſes the exterior ſide of the polygon to be equal to 180 toiſes; and after obſerving that the perpendicular may be of any length, as the 6th, 5th, or 4th part of that ſide, he, like him, alſo fixes on 30 toiſes for its length. Like him alſo he makes the face of his baſtion equal to 50 toiſes, or to $\frac{2}{7}$ths of the exterior ſide.

He determines the ſaliant angle of his ravelin in this manner: he ſets off on the face of his baſtion from 12 to 15 toiſes from the ſhoulder or epaule, and from the oppoſite angle of the flank as centre, with the diſtance therefrom on the line of defence to the extremity of the line, ſet off from the ſhoulder on the face of the baſtion, he interſects the perpendicular to the exterior ſide, produced beyond it outwards.

He alſo gives the conſtruction of a place with detached baſtions from an inward or interior ſide of 130 toiſes, applied to an octagon, in which he ſubſtitutes ſmall baſtions inſtead of Vauban's tower-baſtions. In this method, he makes the demi-gorges of his ſmall baſtions each equal to 12 toiſes, the capitals of his detached baſtions each equal to 55 toiſes, and their faces equal each to 60 toiſes. He determines the ſaliant angle of his ravelin, by deſcribing from the extremity of the flank, as centre, through a point in the face of the oppoſite baſtion, about 20 toiſes from the ſhoulder, an arc to interſect the right line, in which is the capital of the ravelin.

He likewiſe gives the conſtruction of a place with detached orillon-baſtions, beginning outwards, and conſtructing inwards from an exterior ſide of 200 toiſes, and applying it alſo to an octagon.

He makes his perpendicular, in this conſtruction, equal to 40, or a fifth part of the exterior; the faces of his baſtions equal each to 55 toiſes; the radius of the arc, that ſerves to determine the poſition of his flank, equal to 22 toiſes; the width of the ditch of the ſaliant angles equal to 16 toiſes; his orillon equal to 5 toiſes; and he keeps his flank retired 5 toiſes.

The marquis de Montalembert has publiſhed a large treatiſe on fortification, in which he makes much uſe of caſemates and arches ſo much condemned by the Chevalier de Ville. His conſtruction is in fact the ſame with Mr. Blondel's, applied to a right line or polygon, of an infinite or indefinite number of ſides. For in this extreme caſe, which is of all others the moſt defective, Mr. Blondel's conſtruction leaves no curtain, but gives the perpendicular equal to half the exterior ſide, and the angle *diminué* equal to 45°. In deſcending, however, from the right line or polygon of an indefinite number of ſides, Mr. Blondel's conſtruction affords a curtain, which gradually increaſes as the number of the ſides of the polygon decreaſes, whilſt the angle *diminué* at the ſame time gradually decreaſes, which in a hexagon, by his rule for determining it, *viz.* by taking from 45°, a third part of the angle of the centre of the polygon, is equal to 25°. But the marquis de Montalembert makes his angle *diminué* in every polygon, and on all occaſions, invariably equal, to 45°. His conſtruction is formed by the placing of triangles contiguous to one another, or by the juxtapoſition of the angles at the baſes of triangles in ſuch a manner, as to make the other ſides form re-entering angles equal each to a right angle, from which circumſtance it is called *la fortification perpendiculaire.* It therefore affords no curtains or baſtions, but when the ſection is of only an ordinary height, it neceſſarily creates dead parts from the re-entering angles quite to the ſaliant ones, or throughout its whole extent.

It may indeed be alleged, that theſe dead parts can be removed by caſemates in the revetements, counterſcarps, caponiers, &c. &c. and no doubt they may. But what good reaſon can be aſſigned for adopting a mode of conſtruction, which creates every where thoſe very defects, which in conſtructing the body of any place, it has hitherto been the firſt object and principal buſineſs of every fortifier to avoid, and they then having recourſe to a number of expenſive, and otherwiſe unneceſſary, contrivances, merely to get rid of the defects thus created.

As we underſtand that this ſyſtem of fortification has been much diſapproved of by ſome of the ableſt engineers, on the Continent of Europe; and as the late duke of Richmond, when maſter-general of the ordnance, was ſo partial to it, that it was with much difficulty and after a great deal of diſcuſſion, that the engineers in the Portſmouth diviſion, could perſuade him to adopt Vauban's firſt method in preference to it, for the new pentagonal fort, that has been erected on Portſea iſland, near Lancaſtown harbour; a candid and impartial compariſon between theſe two methods of conſtruction may not be uſeleſs to profeſſional men, or unacceptable to the public. But we cannot make a compariſon between them more ably, correctly, and ſcientifically, than it is drawn in an anonymous publication of 1794, re-publiſhed in 1805, in the following words.

"It is manifeſt then, that after a work is once adapted to the ground it is to occupy, &c. the firſt conſideration is to conſtruct it in ſuch a manner, as to leave no dead parts; that is, to leave no ſuch parts as cannot be ſeen, fired on, or flanked from ſome other parts. That this is a fundamental maxim, and ought to be a primary object of attention in the conſtruction of every work, is manifeſt from this circumſtance: that, were it not with a view to obtain flanking defences for the different parts, a rampart and parapet might as well be raiſed along the exterior ſides of figures themſelves, or the curves circumſcribing them, as along the ſeveral parts of thoſe figures, into which the ſides are uſually broken for this purpoſe. The ſtrength of a work, indeed, depends chiefly on its flanks; ſince an enemy cannot approach the body of the place, whilſt the flanking defences remain entire. But if there be dead parts, the moment an enemy gets to them, he finds himſelf in a ſtate of ſecurity, and out of the reach of the beſieged's fire. An idea therefore of the neceſſity of avoiding them has always made ſuch a forcible impreſſion on the minds of able fortifiers, as to induce them to limit the heights of ſections. For even when the ſide of a polygon is 180 toiſes long, and is broken into two demi-baſtions, and a curtain with flanks, if the ſection of the work be very high, the guns in theſe flanks cannot ſee or ſcour the ditch but at too great a diſtance. When it is only of an ordinary height, it is wel lknown that the guns in the flanks do not ſee the ditch effectually nearer than the interſection of the lines of defence, which in Vauban's conſtruction is 44.8683 toiſes, or 45 toiſes nearly from the ſhoulders of the baſtions, and 40.2632, or 40 toiſes and a quarter nearly from the re-entering angles formed by the curtain and flanks. When the exterior ſide, therefore, is leſs than 180 toiſes, the ſection ought to be kept proportionally lower, provided only it be not ſo low as to expoſe the body of the place to ſurpriſe. But if it once be admitted as a maxim, that a fortification ought to be conſtructed without the leaſt regard to any flanking defence, and that the avoiding of dead or unſeen parts is an object not worthy of attention, it is evident that the rectilinear and curvilinear are greatly preferable to the zig-zag or triangular conſtruction formed by conſtituting triangles on the ſides of any right-lined figure or polygon. The fire from a ſtraight line is the beſt of the direct kind that can be obtained, being equally and uniformly diſtributed. And the enemy cannot advance againſt it directly, without a good deal of delay, inconvenience, and trouble, but muſt carry on his approaches ſomewhat in the way commonly practiſed, till he gets to the dead parts in front of it: when, unleſs contrivances be made uſe of that have no natural or inſeparable connexion with the conſtruction itſelf, it will ceaſe to be formidable for want of flanking defences. This obſervation likewiſe holds good in a great meaſure with regard to regular curves, from which the fire is alſo regularly diſtributed. The interior area too in each of theſe comprehended within the ſame enceinte, length of encloſure, or extent of rampart, is much greater than in the triangular conſtruction, which naturally, inſtead of producing any fire that is direct or at right angles to the exterior ſides, produces no good flanking one for itſelf, but cauſes a continuity of dead parts, when the ſection is high and the lines of defence but ſhort, to reign throughout its whole extent. An enemy can approach it without annoyance from the beſieged in lines biſecting either the ſaliant or re-entering angles, or in ſhort in lines directed to any intermediate points whatever between theſe angles.

It muſt therefore be allowed, that the triangular conſtruction, whether the re-entering angles be right ones (as in the "Fortification perpendiculaire" of the marquis de Montalembert), or acute or obtuſe ones, is naturally the moſt defenceleſs and ill contrived of any, that can poſſibly be thought of or conceived: for it creates dead parts throughout the whole extent almoſt of the work, and is equally deſtitute of flanking fires for itſelf, and of a good or well diſtributed direct one againſt the enemy.

The marquis, fig. 4, planche 15, vol. i. of his performance, gives what he calls his regular conſtruction in a dodecagon, of which the exterior ſide is 180 toiſes. The radius of the circumſcribing circle is of courſe equal to 347.733297 or 347.7333 or 348 toiſes nearly, and the perpendicular diſtance from its centre to the exterior ſide 335.884572, or 335.8846, or 336 toiſes nearly. Conſequently the annular area occupied by his conſtruction is equal to that of the inſcribed circle, in the circumference of which are his re-entering angles of 90°, or which comes to the ſame thing, to half the area of the circle circumſcribing the dodecagon. But if Vauban's conſtruction be made on the ſides of the ſame figure, the annular area occupied by it will be to that of the inſcribed circle, to which the curtains are tangents at the points, where the perpendiculars produced meet them, as 34980.228 to 85938.24, or as 17490 to 42969 nearly, or in ſmall numbers as 20 to 49 nearly.

The exterior area between the conſtruction and the ſides of the dodecagon in Momtalembert's method is to that in Vauban's as 8100 to 4270.2687, or in ſmall numbers, as 19 to 10 nearly; and as both the ſaliant and re-entering angles in the former are leſs than in the latter, this difference of loſt area will be conſiderably increaſed in practice. For in the marquis's conſtruction, each of the ſaliant angles contains 60 degrees, and each of the re-entering ones 90; whereas in Vauban's the ſaliant angle of each baſtion is 113° 7′ 48″, and each of the re-entering ones formed by the flanks and curtains is 99° 13′ 3″.

Montalembert's conſtruction gives the enceinte or boundary of the body of the place equal to 3054.70128 toiſes, exceeding Vauban's, which is equal to 2771.2836, by 283.41768 toiſes.

When he inſerts or intercalates triangles having their ſaliant angles right ones and in ſtraight lines, as in figures 3, 5, 7 and 8, planche 15, after the method pointed out in fig. 1, he loſes ſtill more area in proportion to the interior ſpace. And the very circumſtance of his having recourſe to different centres of conſtruction, even on figures that are regular, is ſufficient to create a ſuſpicion, that he did not underſtand even his own method in its full extent.

Although he muſt certainly be conſidered as a very ſhallow and ſuperficial geometer, the reaſon for his not fixing on any polygon under a dodecagon for illuſtrating his regular conſtruction, is very obvious; for no regular figure of a ſmaller number of ſides, will by it give ſaliant angles of ſixty degrees, which is the ſmalleſt angular magnitude that engineers have generally reckoned admiſſible in fortification. I can ſee no good reaſon, however, (ſays our author) for his abandoning regular polygons, when he has occaſion for more triangles than twelve, and by way of interpolation inſerting the additional ones to this number between right lines parallel to the ſides of triangles, ſquares, or rectangles; ſince a conſtruction on the ſides of a regular polygon furniſhes much more interior area, with a comparatively but trifling increaſe of length in the enceinte or encloſure of the body of the place.

The compariſon, which he draws, p. 197, (illuſtrated by fig. 9, planche 15.) between Vauban's method on the ſides of a ſquare, of which each is equal to one hundred and eighty toiſes, and his own on the ſides of a dodecagon inſcribed in the circle circumſcribing this ſquare, is a very improper and unfair one. In this figure, each of thoſe lines, which he calls his lines of defence, is equal to 46.5874 toiſes, and muſt, with a ſection of an ordinary height, have dead parts in front of it throughout its whole extent. Each of the ſides is equal to 65.8846 toiſes very nearly, and not to 66 toiſes one foot, as from his ſcale he erroneouſly ſtates it to be. The moſt candid and impartial mode of comparing theſe two methods of conſtruction together is to ſuppoſe both to be made on the ſides of one and the ſame figure. The marquis's conſtruction, however, on the ſides of a ſquare, neither leaves interior area nor ſaliant angles. For its re-entering angles meet in the centre of the circumſcribing circle. But as in it the lines of defence when equal form angles of 45° with the exterior ſide, each of the ſaliant angles, which it gives in any polygon, is equal to the exceſs of the angle of that polygon above 90°; or which comes to the ſame thing, to the exceſs of the re-entering angle formed by the lines of defence above the angle at the centre of the figure, ſince the exceſs of the angle of any regular polygon above 90° is equal to the exceſs of 90° above the angle at the centre of the circumſcribing circle ſubtended by one of its ſides. Conſequently, when the polygon has an indefinite number of ſides, or becomes a ſtraight line, the ſaliant angle is equal to ninety degrees. Thus a ſquare with this conſtruction gives no ſaliant angle at all; a pentagon one of 18 degrees; a hexagon one of 30 degrees; a heptagon one of 38 degrees and four ſevenths; an octagon one of 45 degrees; an enneagon one of 50 degrees; a decagon one of 54 degrees; an endecagon one of 57 degrees and three elevenths; a dodecagon one of 60 degrees; a polygon of 18 ſides one of 70 degrees; a polygon of 36 ſides one of 80 degrees; and ſo on indefinitely. By this conſtruction on a pentagon, of which the ſide is equal to 180 toiſes, the re-entering angles come within 34 toiſes of the centre of the circumſcribing circle; and within 19, if the exterior ſide be only equal to a hundred toiſes. How little interior area then would have been left, had this conſtruction been made uſe of for the new pentagonal work on Portſea iſland, called Fort Cumberland, of which one of the exterior ſides is equal to 120 fathoms, and each of the other four to a hundred! Even on a hexagon, of which the ſide is equal to 180 toiſes, it brings the re-entering angles within 66 toiſes of the centre of the circumſcribing circle, and gives the annular area occupied by it to the area of the inſcribed circle as $2\sqrt{3}$ to $4-2\sqrt{3}$, or as 6.4641 to 1, or in ſmall numbers as thirteen to two nearly. If it be even made on parts of one and the ſame ſtraight line as exterior ſides, of which each is equal to 90 toiſes only, the perpendicular diſtance between that line and the right line paſſing parallel to it through the re-entering angles exceeds that between the parallel right lines, limiting Vauban's conſtruction on parts of one and the ſame ſtraight line as exterior ſides equal each to 180 toiſes, or two of the others, by 2.2676 toiſes, and only becomes equal to it, when the exterior ſide is reduced to 85.4648 toiſes.

The angle (108°) of a pentagon exceeds 90° by 18°, which are equal to the exceſs of 90° above (72°) the angle of the centre. But 18° are equal to $90° \times \frac{1}{5}$ or $360° \times \frac{1}{4 \times 5}$. In like manner the exceſs of (120°) the angle of a hexagon above 90° is equal to 18° + 12° (= 30°) the exceſs of 90° above (60°) the angle of the centre, that is, to $360° \times (\frac{1}{4.5} + \frac{1}{5.6})$. Wherefore we get $360° \times (\frac{1}{4.5} \times \frac{1}{5.6} + \frac{1}{6.7} \times$, &c. indefinitely or *ad infinitum*) $= 90°$, and of courſe $\frac{1}{4.5} + \frac{1}{5.6} + \frac{1}{6.7} +$, &c. *ad infinitum* $= \frac{1}{4}$. Whence it is obvious, that methods of ſumming an endleſs variety of ſuch ſeries, together with ſuch ſeries, as $\frac{n+m}{n.\overline{n+1}.\overline{n+m+1}} + \frac{n+m+1}{\overline{n+1}.\overline{n+2}.\overline{n+m+2}} +$, &c. *ad infinitum*, and innumerable other forms, may eaſily be derived from common geometry and the angular relations of rectilinear figures. But the ſummation of infinite ſeries is a ſubject which it is not my intention to enter into the conſideration of at preſent.

There is a circumſtance attending this conſtruction, which, I dare ſay, never occurred to the marquis. It is this: though on the ſides of a ſquare it brings the re-entering angles to the centre of the circumſcribing circle, and leaves neither interior area nor ſaliant angles; yet, if it be made on the ſides of any given regular polygon, and the re-entering angles be joined by right angles forming a ſimilar polygon, and on them a ſimilar conſtruction be made, and ſo on indefinitely or *ad infinitum*, it will never bring the re-entering angles to the centre of the circle circumſcribing the given polygon, but nearer to it than by any given right line or diſtance. And if ſpirals be ſuppoſed to paſs from the angles of the polygon through the angular points of equal angles in endleſs or indefinite ſucceſſion (each equal to 45 degrees, together with the ſaliant angle of the conſtruction and the complement of its half) formed by the lines of defence taken ſingly from the firſt in the indefinitely ſucceſſive conſtructions, will paſs round the centre of the circle circumſcribing the given polygon an indefinite number of times without ever reaching it; and the area between any two of theſe ſpirals commencing from one of the exterior ſides of the polygon will become nearer in point of equality than by any given ſpace or area to ſuch a part of the polygon, as is expreſſed by the number of its ſides, without ever equalling it. The ſum or aggregate of theſe lines of defence, in decreaſing geometrical progreſſion and endleſs ſucceſſion, can always be expreſſed by a given definite ſtraight line.

From what has been obſerved, the following inferences may certainly be very fairly and impartially drawn reſpecting Montalembert's conſtruction:—1ſt. When the exterior ſides are ſhort, it naturally creates, with a ſection of an ordinary height, dead parts throughout its whole extent. It may perhaps be alleged, that this capital defect can be removed by caſemated defences with artillery near the re-entering angles on a level almoſt with the ditch. To a certain degree it certainly may: but that method of conſtruction, which by itſelf naturally removes every ſuch defect without any ſubſequent or adventitious contrivance, is ſurely entitled to preference in the opinion of every able or intelligent fortifier.

2dly. His ſaliant angles are too ſmall, being leſs in a dodecagon than Vauban's are even in a ſquare; for in a dodecagon his ſaliant angle is only equal to ſixty degrees, whereas in a ſquare Vauban's is equal to 60° 55′ 39″, and in the dodecagon 113° 7′ 48″. This is unqueſtionably an eſſential defect.

3dly. It furniſhes no fire that is direct or perpendicular to the exterior ſides. That this is a great defect cannot be denied.

4thly. Oppoſite to each re-entering angle, at the diſtance only of 90 toiſes from the exterior ſide, there is a quadrangular ſpace (which no fire from the place ſcours, commands, or touches), commencing in an angle of 90 degrees, and terminating in one of 30 degrees, at the ſame diſtance from the exterior ſide with the centre of the dodecagon.

5thly. Oppoſite to every ſaliant angle, and at the diſtance from it only of about 254 toiſes and a half, there is a ſpace that is not ſcoured or commanded by the fire of the place, which commences in an angle of 60 degrees, widens till its breadth becomes equal to the radius of the circle circumſcribing the dodecagon, and then runs on indefinitely at that width between parallel lines.

6thly. The greateſt width of each of the firſt-mentioned ſpaces not traverſed by the fire of the place is to the correſponding width of each of the ſpaces traverſed by it as 104 to 147, nearly: and the greateſt width of each of the laſt-mentioned ſpaces not traverſed by the fire is to the correſponding width of each of the ſpaces traverſed by it as the radius of the circle circumſcribing the dodecagon to 131.769 toiſes, or as 264 to 100, nearly.

7thly. As the reſpective breadths of theſe ſpaces not covered by the fire of the place bear ſo great proportions to the correſponding breadths of thoſe covered by it, and, as the diſtance between every two of them is only equal to one of his lines of defence, or 127.2794 toiſes, the beſiegers may advance almoſt to the very creſt of the glacis without any interruption from the fire of the beſieged. But it is an important object in defence to keep the beſiegers at a diſtance from the body of the place as long as poſſible. For when they once get within the diſtance of ſerious muſketry from it, they will infallibly ſilence artillery, whether the embraſures be open or covered at top, or whether the guns be in caſemates or not.

8thly. The beſiegers may eaſily deſtroy his principal covered muſketry-defences before they are expoſed to his principal caſemated defences with artillery, which being low, to take off the dead parts unavoidably occaſioned by the very nature and badneſs of his conſtruction, are chiefly calculated for defending the paſſage of the ditch, and cannot annoy an enemy till he gets to the very creſt of the glacis, after which every thing almoſt, except battering in breach, is determined without artillery.

Laſtly. The great proportion which the annular area, occupied by his conſtruction, bears to that of the inſcribed circle, will for ever render it unfit for the purpoſe of fortifying any conſiderable town or city.

The marquis de Montalembert's conſtruction has no claim even to originality, if we except the great impropriety (I had almoſt ſaid folly) of making the lines of defence in it form the ſame angle in all figures, and on all occaſions; for when applied to a ſtraight line (as in fig. 1, planche 15, vol. i.) it is the ſame with Mr. Blondel's. In this caſe both give the perpendicular equal to half the exterior ſide, the angle *diminué* equal to 45°, the ſaliant angle of the baſtion equal to 90°, the ſame line of defence, the ſame flanking or re-entering angle, and no curtain. The only difference between them conſiſts in this, that Mr. Blondel, in deſcending from the right line or polygon of an indefinite number of ſides to inferior polygons, makes his angle *diminué* gradually decreaſe according to the rule he has delivered for aſcertaining its magnitude, whereas the marquis keeps his in all figures invariably the ſame. [Mr. Blondel's rule for aſcertaining the angle *diminué* is the following: add fifteen degrees to one-third part of the exceſs of the angle of the polygon above 90 degrees.] Mr. Blondel's conſtruction on an indefinite right line gives the perpendicular nearly double what it ought to be; and the marquis, by keeping this prepoſterouſly large perpendicular in all figures on the ſame exterior ſide and his angle *diminué* invariable, finds the ſaliant angle of his dodecagon equal only to 60°, the ſmalleſt that is generally conſidered by engineers as admiſſible in fortification. This circumſtance, therefore, by the marquis's own acknowledgment, renders his conſtruction inapplicable to any polygon of a ſmaller number of ſides than twelve, and is certainly ſufficient of itſelf to demonſtrate not only its impropriety, but, I believe I may venture to ſay, even abſolute abſurdity. It in fact furniſhes nothing but ſtar-figures with re-entering angles of 90°; and it is manifeſt that no regular figure of this ſort under a dodecagon will give ſaliant angles of 60°.

Notwithſtanding theſe obſervations, which I have certainly made with the ſtricteſt attention to truth, and, I flatter myſelf, alſo to candour, I am heartily diſpoſed to allow every ſort of merit to the marquis's voluminous performance, that either his grace or any other perſon can point out as really belonging to it. I never can be hoſtile to any perſon who even endeavours to enlarge the pomœria either of abſtract ſcience or profeſſional knowledge; for the very attempt is laudable. And I muſt confeſs I am inclined to believe, that ſome of his caſemated contrivances might, in certain ſituations and circumſtances, be advantageouſly united with Vauban's conſtruction. I cannot help conſidering him however as rather a ſuperficial geometer, and as a very looſe and incorrect writer. But to prevent the poſſibility of charging me with miſrepreſentation in regard of his incorrectneſs, I will briefly quote his own words.

In his "Diſcours Préliminaire," p. 38, he ſays, "Le premier ſyſteme de M. de Cohorn eſt abſolument le même que celui du Comte de Pagan, auquel il a ſeulement ajouté une tour caſmatée à chaque orillon, pour défendre les faces hautes des baſtions."

That he ſhould have hazarded ſuch an aſſertion is to me aſtoniſhing. For theſe two methods differ widely and eſſentially. In Coehorn's firſt method, which is applied to a hexagon, for inſtance, the ratio between the perpendicular and exterior ſide is very different from what it is in Count Pagan's; ſince in the firſt the angle formed by the exterior ſide and line of defence is equal to 24° 38′ 48″, whereas in the laſt it is only equal to 18° 26′ 6″. The difference is 6° 12′ 42″. The ſaliant angle of the baſtion in a hexagon by Count Pagan's method is equal to 83° 7′ 48″, whereas in Coehorn's firſt method it is only 70° 42′ 24″, falling ſhort of the other by 12° 35′ 24″. Theſe are capital and eſſential differences. And every perſon who chooſes to examine them will find them very different in many other reſpects. Vauban indeed appears to have borrowed more from Pagan than Coehorn has done. For, in any polygon having its exterior ſide equal to 180 toiſes, their perpendiculars are equal as well as the ſaliant angles of their baſtions; and I am perſuaded that even the greateſt admirers of Vauban can aſſign no good reaſon for his not having followed Count Pagan alſo with regard to the poſition of his flank, and placed it at right angles to the line of defence inſtead of making them meet in an angle of 80° 46′ 57″. There is great reaſon to ſuppoſe that the Count would have made the face of his baſtion conſiderably ſhorter than he did, had he not intended to have three flanks inſtead of one. He makes it 55 toiſes. But it is naturally to be preſumed, that had he intended to conſtruct with a ſingle flank, he would have biſected the perpendicular diſtance between his orillon and inner flank (which is 19 toiſes), and drawn his flank at right angles to the line of defence through this point of biſection, thereby forming a more complete conſtruction for the body of the place with ſingle flanks than Vauban has done. And it is ſomewhat remarkable, that this line nearly coincides with a perpendicular to Vauban's line of defence from its point of interſection with the flank. Had he therefore, inſtead of taking five toiſes from the face of Count Pagan's baſtion, taken ten, and then placed his flank at right angles to the line of defence, he would, without lengthening this line, have given the face of his baſtion its proper length, and at the ſame time made the flank itſelf about equal to the perpendicular, as it ought to be, ſince perpendiculars to the exterior ſides of polygons were firſt introduced into conſtruction for the ſole purpoſe of obtaining flanking defences. Were I at preſent treating formally of fortification, I would deliver a very ſimple method of conſtruction for rendering the flanks always equal to the perpendiculars to the ſides of the polygons. The lengths however aſſigned to theſe perpendiculars are merely arbitrary, and by no means derived from reaſoning either on the properties of the figures or their relative degrees of importance and capability of defence. For there appears no reaſon for giving the ſame perpendicular to a hexagon and every other polygon of a greater number of ſides, as Vauban has done, or to all regular figures above the ſquare, as Count Pagan has done. In like manner Coehorn's perpendiculars are too long, and merely arbitrary: for in his firſt method, which is applied to a hexagon, the angle formed by the exterior ſide and line of defence is, as I have already obſerved, equal to 24° 38′ 48″; in the ſecond, which is applied to a heptagon, 24 degrees and two ſevenths; and in the third, which is applied to an octagon, 25 degrees. This angle in Belidor's firſt and ſecond methods applied to an octagon is alſo too great, being in the former equal to 26° 33′ 54″, and in the latter to 28° 48′ 39″. In his third method however, which is alſo applied to an octagon, it is equal to 21° 48′ 5″, and is not ſo much diſtant from what it really ought to be, as it differs only about three minutes from the angle ſubtended by the true perpendicular of an enneagon.

The perpendiculars are alſo a great deal too long in Blondel's method, which, when it is applied to a ſtraight line or polygon of an indefinite number of ſides, gives one equal to half the exterior ſide.

The marquis, vol. i. p. 193, ſays, "Mais dès que lignes de défenſe peuvent avoir juſqu'à cent cinquante toiſes, et les hypoténuſes environ deux cent dix-huit toiſes, il ſuit que le rayon de ce polygône régulier inſcrit dans le cercle peut être de quatre cent vingt-une toiſes et demie, le rapport du côté du dodecagône à ſon rayon étant comme quinze eſt á vingt-neuf environ, et ce rayon eſt à-peu-près celui d'un polygône à baſtions de quinze côtés, par conſéquent de quinze baſtions."

A right-angled triangle however, having each of the ſides containing the right angle equal to 150 toiſes, does not give the hypothenuſe equal to 218 toiſes, but to 212.132 toiſes, which, as the ſide of a dodecagon, gives the radius of the circumſcribing circle equal to 409.876 toiſes very nearly, and not to 421 and a half, as he ſtates it to be.

In page 203 he falls into the ſame miſtake.—Take however his own words:

"Mais l'on a vu, comme il eſt aiſé de le ſentir, qu'il eſt un terme où le rayon d'un cercle ne pourroit plus déterminer le côté de notre maniere de fortifier: et ce terme eſt celui où la corde de l'angle au centre de trente degrés que le rayon donneroit, paſſeroit deux cent vingt toiſes, puiſqu'alors cette corde priſe pour diagonale auroit deux côtés de plus de cent cinquante toiſes chacun, qui eſt une diſtance plus grande que celle admiſe pour la portée des armes à feu de but en blanc."

Here he mentions 150 toiſes as the greateſt admiſſible length for each of the lines of defence, and 220 for the correſponding hypothenuſe, or exterior ſide, which he calls the diagonal. But the fact is, that a hypothenuſe of 220 toiſes, gives either ſide of an iſoſceles right-angled triangle conſtituted on it greater than 155 toiſes and a half. There are many miſtakes of a ſimilar nature in this gentleman's performance, who appears to have uſed ſcales much more than calculation. The expoſure of error, however, is an unpleaſant taſk, even when the elucidation of truth is the object."

From the whole of what is above delivered, it appears evident, that the magnitude of the angle *diminué*, and of the perpendicular to the exterior ſide, on which the other parts of the conſtruction chiefly depend, is with all the writers on fortification a mere arbitrary aſſumption, for which they do not even attempt to aſſign any reaſon, and much leſs any good one, drawn from the nature of the polygons themſelves, the relative degrees of difficulty in embracing them, or their reſpective degrees of capability of defence. The truth is this, that every polygon has a perpendicular belonging to itſelf, of a preciſe and determinable length, or bearing a given ratio to the exterior ſide. And the aſcertaining of the true perpendiculars belonging to all different polygons is the great deſideratum now wanted for perfecting military conſtruction. We underſtand, that Mr. Glenie, formerly of his majeſty's corps of engineers, has had in his poſſeſſion a complete inveſtigation of this important problem for upwards of twenty-five years. But as he has not yet choſen to make it known to any perſon, we could not expect him to communicate it to us. He has, however, been pleaſed to furniſh us with the following rules, which have been made known to ſeveral individuals, both for regular and irregular conſtruction, on the latter of which nothing of extenſive application or much deſerving of notice has as yet been delivered by the writers on fortification.

A ſhort paper on fortification, delivering a method of conſtruction for always making the flanks either equal to the perpendiculars to the exterior ſides, or in any given ratio to them, and alſo a rule alike applicable to regular and irregular conſtruction; and, in its application to the latter of theſe, infinitely more extenſive than all that has been hitherto publiſhed on the ſubject. By James Glenie, eſq. A. M., and fellow of the Royal Societies of London and Edinburgh.

"After the invention of gun-powder, the ancient method of ſecuring and fortifying places was gradually departed from. Various and important alterations were by degrees introduced into fortification, as the conſtruction and management of artillery became more and more improved. Many treatiſes have been written on the ſubject in different nations and languages. And could we for a moment ſuppoſe improvements in the *ars muniendi* to have kept pace with theſe publications, we muſt naturally conclude, that military conſtruction has by this time reached almoſt all the perfection it is capable of. But although war has been a profeſſion in Europe, and the attack and defence of places has been ſtudied as a ſcience for almoſt theſe two centuries paſt, it is a certain and undeniable fact, that no writer on fortification has as yet either diſcovered or demonſtrated the true lengths of thoſe lines, on which the other parts of the conſtruction of a work chiefly depend; *viz.* the perpendiculars to the ſides of a polygon, from which the body of the place is to be conſtructed. No writers on this ſubject have aſſigned any ſufficient, good, or even plauſible reaſons for the lengths they give to theſe lines. With them all, without a ſingle exception, the perpendiculars to the exterior ſides of a work are mere arbitrary aſſumptions, and not the reſult either of any ſcientific or profeſſional inveſtigation. Even Mr. Muller, in the three new conſtructions which he gives in his “ Elements of Fortification,” in imitation of others, aſſumes thoſe lines in a manner altogether arbitrary, without aſſigning any reaſon whatſoever for ſuch aſſumptions. In page 76 of his ſaid elements, in his problem “ for determining the ſeveral parts of a front of a fortification,” he makes uſe of the following words: “ But as to the length of the perpendicular C D, it is no ways determined; for ſome engineers make it twice as long as others; they ſeem indeed to differ from one another merely out of contradiction; ſince none of them, that I know of, has given any reaſon for this practice.” This obſervation ſufficiently ſhews, in what an imperfect ſtate military conſtruction remains even at preſent. For the true lengths of the perpendiculars form the great deſideratum in it, ſince on them the flanking defences chiefly depend; for the ſole purpoſe of obtaining which, and preventing *dead* parts, the ſides of a polygon are broken, each of them into a curtain with two demi-baſtions to form the reſpective fronts of the work. And it muſt be allowed, that when a work is once adapted to the ground, it is intended to occupy, and its poſition is fixed on, the firſt conſideration after determining the true lengths of the perpendiculars to the exterior ſides, is to conſtruct the whole of it in ſuch a manner, as to have no dead parts; that is, to leave no ſuch parts, as cannot be ſeen, fired on, or flanked from ſome other parts. That this is a leading or fundamental maxim, and ought to be a primary object of attention in the conſtruction of every work, is manifeſt from this circumſtance, that were it not with a view to obtain flanking defences for the different parts, a rampart and parapet might as well be erected on the exterior ſides themſelves of a fortification as on the figures, into which they are uſually broken for that purpoſe. The ſtrength of a work, indeed, it muſt be confeſſed, depends chiefly on its flanks, ſince an enemy cannot approach the body of the place, whilſt the flanking defences remain entire. But if there be any dead parts through a deficiency of ſuch defences, the moment an enemy gets to them, he finds himſelf in a ſtate of ſecurity, and out of the reach of the beſieged's fire. The abſolute neceſſity of avoiding them, has always made ſuch a forcible impreſſion on the minds of able fortifiers, as to make them limit the height of ſections. For even when the ſide of a polygon is not more than 180 toiſes, or 360 yards long, and is broken into a curtain with two demi-baſtions, if the ſection of the work be very high, the guns in the flanks cannot *ſee* or ſcour the ditch but at too great a diſtance; and it is well known, that when it is only of an ordinary height, they cannot ſee or command it effectually, nearer than the interſection of the lines of defence. But were it even to be alleged, which would however be an allegation altogether inadmiſſible, that a fortification ought to be conſtructed without the leaſt regard to any flanking defences, and that the avoiding of dead or unſeen parts is an object unworthy of attention, it is evident that the rectilinear is preferable to the zig-zag or angular conſtruction formed by the placing of triangles contiguous to one another, or by the juxta-poſition of angles at the baſes of triangles. For the fire from a ſtraight line is the beſt of the direct kind that can be obtained, being equally and uniformly diſtributed. And the enemy cannot advance againſt it directly, without a good deal of delay, inconvenience, and trouble, but muſt carry on his approaches ſomewhat in the way commonly practiſed, till he gets to the dead parts in front of it, when it will ceaſe to be formidable for want of flanking defences. The angular or zig-zag line, on the other hand, has no good direct fire, and indeed no flanking fire whatever, where it is moſt wanted, or can be of any utility; but a continuity of dead parts, when the ſection is of a ſufficient height, reigns throughout its whole extent. An enemy can approach it without being expoſed to any direct fire from the beſieged, that can annoy him, in the lines biſecting either the ſaliant or re-entering angles, or, in ſhort, in lines directed to any other intermediate points whatſoever, between theſe angles.

And it is no leſs evident, that the direct fire from the circumference of a circle, or from any other curve, that returns into itſelf, is much more equal and uniform, and better diſtributed than that from an angular or zig-zag line.

That able general and fortifier, the celebrated marſhal Vauban, whoſe ſyſtem has been moſt generally followed in Europe, in conſtructing from the ſides of a ſquare, made the perpendicular an eighth part of one of them, in a pentagon a ſeventh part, and in a hexagon, and all polygons of a greater number of ſides, a ſixth part. For this practice, however, he has not aſſigned any reaſons. It is impoſſible indeed to aſſign any good reaſon for giving to a polygon of twenty or thirty ſides, or to a conſtruction on part of a right line, which may be regarded as a polygon of an indefinite or infinite number of ſides, and to a hexagon, or a figure of only ſix ſides, the ſame length of perpendicular. Any perſon, without even a knowledge of geometry, to enable him to draw deductions from the properties of figures themſelves, who reflects but a little on the ſubject, muſt naturally conclude, that there can be no ſound or good reaſon for doing ſo. The truth, in fact, is this, that every polygon has a preciſe and determinate perpendicular of its own, proportional to and connected with its capability of being defended, and of being embraced by a beſieging enemy, as, ſays Mr. Glenie, I ſhall clearly demonſtrate in a ſubſequent paper, that may ere long be preſented to the ſociety, as well as ſhew, how an indefinite number of infinite ſeries may not only be derived from, but alſo ſummed geometrically by means of polygons: and I make no doubt, that had Vauban poſſeſſed a ſufficient knowledge of mathematics for the purpoſe of applying them to the improvement of the theoretical part of his profeſſion, he would have diſcovered the preciſe or genuine lengths of perpendiculars, which different polygons ought to have, and would have regulated his practice accordingly, in the numerous works he conſtructed. Unwilling to give into prolixity, I will not, at preſent, enumerate the different lengths of perpendiculars to the ſides of one and the ſame figure or polygon, which the various writers on fortification have aſſumed, although the enumeration would prove beyond controverſy, that in aſſuming them they were guided by their own whims and fancies, and not by any juſt or determinate rule. It muſt however be regarded as a ſingular fact, that though perpendiculars to the ſides of polygons were firſt introduced into conſtruction, for the ſole purpoſe of obtaining flanking defences, not one of theſe writers, in even treating formally of regular fortification, has either offered, or attempted to deliver, a method of conſtruction for rendering the flanks always equal to the perpendiculars as they ought to be. To ſupply this defect I will now proceed to give ſuch a conſtruction, which, like many other things in ſcience, moſt pregnant with utility, and moſt extenſive in their conſequences, has probably been hitherto overlooked chiefly on account of its ſimplicity.

Conſtruction.

Let A B (*fig.* 17.) be a ſide of any given polygon, either regular or irregular. Let it be biſected in the point C, and let C V be an indefinite perpendicular to A B at the point C. Through the point O let indefinite right lines A S, B T, be drawn from the points A, B, and let C D, C E, be each equal to one-half of AO or BO. Draw the right lines DF, E G, parallel to C V till they meet A S, B T, in the points F, G; and from the ſaid points F, G, draw F K, G L, perpendicular reſpectively to B T, A S. Then I ſay that F K, G L, are each equal to C O.

Demonſtration.

Since by conſtruction A D is equal to B E, and A C to B C, and C O is perpendicular to A B, the angle C A O, or D A F, is equal to the angle C B O or E B G, and D F is equal to E G, being parallel thereto. Wherefore F G is parallel to A B, and equal to D E, which is equal to A O or B O. Conſequently, ſince F K is perpendicular to B T, and G L to A S, by conſtruction, the triangles A C O, G K F, F L G, are equiangular and equal, and C O, F K, G L are equal. Q. E. D.

Thus then the flanks G L, F K, drawn at right angles to the lines of defence A L, B K, or A S, B T, are by this very ſimple conſtruction always equal each of them to the perpendicular C O, whether A B be the ſide of a regular or an irregular polygon.

The perpendicular diſtances F L, G K, of the flanks G L, F K, from the ſhoulders F, G, of the demi-baſtions A F K, B G L, are each of them equal to half the exterior ſide A B. And each of theſe perpendicular diſtances F L, G K, is to the curtain K L, as the ſine of the angle formed by either flank, and ſaid curtain, to the ſine of the angle at the ſhoulder of either demi-baſtion, that is, as the coſine of the angle formed by the exterior ſide, and either line of defence, to the coſine of twice this angle.

From the ſimilarity of the triangles A C O, A D F, B C O, B E G, we have each of the faces A F, B G, of the demi-baſtions equal to $\frac{AO \times AD}{AC}$, or to $\frac{AO \times \overline{AC - \frac{AO}{2}}}{AC}$, or to $\frac{AO \times \overline{2AC - AO}}{2AC}$. Now if A B, or 2 A C, be denoted by 2 P and A O — A C by 2 Q, each of theſe faces will be expreſſed by $\frac{\overline{P + 2Q} \times \overline{P - 2Q}}{2P}$, or by $\frac{P}{2} - \frac{2Q^2}{P}$, which, when the perpendicular C O is but ſmall, is nearly equal to the half of A C, or to a fourth part of the exterior ſide A B.

Each of the angles A F K, B G L, of the ſhoulders of the demi-baſtions is equal to a right angle, together with the angles B A O, A B O, formed by the exterior ſide A B, and the lines of defence.

Scholium.

In like manner may a conſtruction be delivered, which will make each of the flanks F K, G L, have any given ratio $m : n$ whatſoever to the perpendicular C O. For if C D or C E be taken to $\frac{AO}{2}$ as $n : m$, we ſhall have D E equal to $\frac{AO \times m}{n}$, or $n : m$ :: A O : D E (F G) :: C O : G L or F H. And if A C be denoted as above by P and A O by P + 2 Q, each of the faces A F, BG, of the demi-baſtions, will, in this caſe, be equal to $\frac{2n - m}{2n} \times P + \frac{n - m}{n} \times 2Q - \frac{m}{n} \times \frac{2Q^2}{P}$.

Mr. Muller, in the preface to his "Elements of Fortification," expreſſes himſelf in the following words:

"Notwithſtanding the art. - - others."

"For the true art conſiſts in - - weakeſt."

Mr. Muller certainly treats of irregular fortification in a more direct and particular manner than any other author that wrote on the ſubject before him. But his conſtructions on the ſides of an irregular polygon are ſimilar to that which he makes uſe of on the ſides of a regular one. His perpendiculars in both are mere arbitrary aſſumptions, and the flanks, as well as the faces, of his demi-baſtions in each front of both are equal. The rules therefore delivered by him, as well as by the other writers on fortification, may juſtly be regarded as only applicable to regular conſtruction. For although they treat of irregular fortification, they ſuppoſe the perpendiculars to biſect the exterior ſides, the lines of defence, drawn from the extremities of any one of theſe ſides, to make equal angles with it, and the correſpondent parts, ſuch as the faces and flanks ſet off from the ſame, to be equal, alike, and ſimilar. They do not ſo much as even contemplate or once ſpeak of any caſe, wherein the lines of defence make different angles with the exterior ſide, or wherein either the flanks or faces of the ſame front are of different lengths, or unequal to each other. It frequently happens, however, that an engineer cannot preſerve this equality between either the faces or the flanks ſet off from the ſame exterior ſide, without loſing the principal advantages ariſing from the nature and ſituation of the ground, and deviating from what ought to be the leading maxim in the conſtruction of every work, namely, the proportioning of the fire of each part, as nearly as poſſible, to that which the enemy can bring againſt it; or, in other words, the defence in every place to the attack. To remove this difficulty and inconvenience, and to enable engineers to practiſe with facility and expedition the whole poſſible variety of irregular conſtruction, I will proceed to deliver a rule, which I have had in my poſſeſſion for nearly twenty-two years, but have not till now thought proper to communicate to the public. Its ſimplicity has, I ſuppoſe, been the principal cauſe of its being ſo long unnoticed or unattended to. It is eaſily and expeditiouſly carried into practice. It is alike applicable to regular and irregular conſtruction, and in its application to the latter is infinitely more extenſive than all, that has hitherto been publiſhed on the ſubject.

This rule is derived from the following very ſimple geometrical propoſition.

If from the extremities of any given right line, two right lines be drawn in any angles, either equal or unequal, and from any two points in theſe lines, two other right lines be drawn reciprocally meeting them, produced beyond their interſection in any given angle, the angles formed thereby at theſe points, will be equal between themſelves, and each of them equal to the two firſt mentioned angles, together with the given angle.

Demonſtration.

Let AB (*fig.* 18.) be the given right line, from the extremities A and B, of which right lines AF, BE are drawn, making any angles F A B, E B A, therewith whatever, either equal or unequal; and from any two points, C and D, in theſe lines, let other right lines C E, C D reciprocally meeting them, produced beyond their interſection I in angles C E I, D F I, equal each to the given angle. I ſay that the angles

A C E, B D F, formed thereby, are equal, and that each of them is equal to the angle C E I or D F I, together with the angles F A B and E B A.

For (by 32 E. 1.) the angle A C E is equal to the angle C E I, together with the angle C I E: and by the ſame propoſition, the angle C I E is equal to the angle I A B, together with the angle I B A. Therefore A C E is equal to C E I or D F I, together with F A B and E B A.

In like manner, B D F is equal to D F I or C E A, together with F A B and E B A, and conſequently is equal to A C E. Q. E. D.

From the foregoing very ſimple propoſition is derived the following rule.

Whether the angles, which the lines of defence drawn from the extremities of any exterior ſide make therewith, be equal or unequal, and the angle made by another flank with its line of defence be equal, or greater, or leſs than a right angle; in every caſe, the angle of either ſhoulder is equal to theſe three angles taken together; that is, to the angle formed by either flank with its line of defence, together with the two angles formed by the lines of defence with the exterior ſide.

By means of this rule, an engineer may trace out any work, however irregular, in a tenth part of the time requiſite for tracing out even a regular work of the ſame ſize and dimenſions, by the methods of conſtruction hitherto preſcribed and made uſe of. He is under no neceſſity of finding the centre, or of erecting perpendiculars to the exterior ſides, which, in irregular conſtruction, cannot be fixed and aſcertained without calculation, trouble, and inconvenience; but after determining in his own mind on the angles, which the lines of defence are to make with the exterior ſides, and laying them down, fixes the poſitions of the flanks, and ſets them off from the ſhoulders, almoſt as expeditiouſly as he can walk over the ground. He may uſe it in woody places, with nearly as much eaſe and facility as in thoſe that are clear and open; and in every ſituation, in ſhort, where he can ſee to the diſtance of a few yards on each ſide of him. By it he can trace out in the field, and even in the face of an enemy, with almoſt mathematical exactneſs and accuracy, and much more expeditiouſly than by the tentative and inaccurate random-methods commonly made uſe of, and without the aid of a theodolite, plain table, or other bulky or cumberſome mathematical inſtrument: for a pocket Hadley's ſextant, which will be uſeful on moſt occaſions, is all that is neceſſary in any ſituation.

It may not perhaps be improper to mention the circumſtance that firſt led me to think of this rule, and gave riſe to the putting of it in practice. In ſummer, 1783, Colonel Moncrief, Lieutenant Fiddes of the Engineer-corps, and myſelf, went one forenoon to trace out a large pentagonal work, near Stoke's Bay Houſe and Gomer Pond in the Goſport diviſion, on one of the fronts of which it was thought adviſable, from the nature of the ground, to have the flanks of different lengths, and thereby to vary the directions of their fire, and thoſe of the faces of the demi-baſtions, from thoſe which the ordinary method of conſtruction would have given. Colonel Moncrief, who, though he was commonly and juſtly reckoned a good judge of ground and poſitions, was, from the inapplicability of the cuſtomary rules to ſuch a caſe, totally at a loſs for the conſtruction. He had Muller's "Elements of Fortification" in his hands, but could derive no aid or aſſiſtance from them. His embarraſſment, and the novelty of our ſituation, which none of us had thought of beforehand, ſet me a thinking ſeriouſly how we might ſurmount the difficulty. After a few minutes reflection, I diſcovered the foregoing rule, which I immediately applied on the ſpot, and very expeditiouſly. I might, however, as well as others, have overlooked it even to this moment, had it not been for the incident now mentioned. For the ſimpleſt and moſt uſeful things are generally leaſt attended to. I gave copies of it in writing to theſe two gentlemen at their requeſt, and another to his grace of Richmond.

There are various maxims delivered by the writers on fortification, which relate to the conſtruction and defences of the works, independent of the general conſiderations for or againſt the erection of the fortifications themſelves, in different circumſtances and ſituations. Some of theſe maxims, however, are very queſtionable, and, on due examination, would be found to be inadmiſſible, having been laid down by men who did not underſtand the true principles of conſtruction.

The following may, perhaps, be juſtly regarded as the moſt unexceptionable of the maxims that are commonly delivered.

1. There ought to be no part in the whole circuit, or *enceinte*, of a fortreſs or fortification that cannot be ſeen, flanked, or defended from ſome other part. That this is not only an admiſſible but a fundamental maxim, and ought to be a primary object of attention in the conſtruction of every work, is manifeſt from this circumſtance: that, were it not with a view to obtain flanking defences for the different parts, a rampart and parapet might as well be erected on the right lines themſelves, which form the exterior ſides of polygons, as on the figures, into which they are uſually broken for this purpoſe. The ſtrength of a work indeed depends chiefly on its flanks, ſince an enemy cannot approach the body of the place whilſt the flanking defences remain entire. But if there be *dead* or *unſeen* parts, the moment an enemy gets to them he finds himſelf in a ſtate of ſecurity, and out of the reach of the beſieged's fire. An idea, therefore, of the abſolute neceſſity of avoiding them, has always made ſuch a forcible impreſſion on the minds of able fortifiers, as to induce them to limit the height of ſections. For even when the ſide of a polygon is equal to 180 toiſes, or to 360 yards, and is broken into two demi-baſtions and a curtain with flanks, if the ſection of the work be very high, the guns in theſe flanks cannot ſee or ſcour the ditch, but at too great a diſtance. When it is only of an ordinary height, it is well known, that the guns in the flanks do not ſee the ditch effectually nearer than the interſection of the lines of defence, the diſtance of which, in Vauban's conſtruction, from the epaules or ſhoulders, is equal to 45 toiſes nearly. Mr. Blondel's conſtruction, therefore, in polygons of a great number of ſides, and that of the marquis de Montalembert, which is nothing but Mr. Blondel's on a ſtraight line or a polygon of an infinite or indefinite number of ſides, are in this reſpect radically defective, creating dead or unſeen parts throughout their whole extent, which cannot be removed but by caſemates and contrivances, that have no natural connexion whatſoever with the conſtructions themſelves.

2. The defence of every part ought to be always within the certain reach of muſket-ſhot, in order to be defended both by great and ſmall fire-arms: for if any parts be at too great a diſtance from thoſe that flank them, to be within the reach of a ſerious and efficient fire of muſketry, or can be defended by cannon only, the enemy may diſmount theſe cannon by the ſuperiority of his, and thereby deſtroy the defences of ſuch parts at once. But if they be defended

by both cannon and muſketry, ſhould one of theſe two ſpecies of defence be deſtroyed, the other will ſtill remain.

It has been frequently alleged, that a muſket-ſhot will not kill at a greater diſtance than 150 toiſes, or 300 yards, or 900 feet. If this be true, the great line of defence, or the diſtance from the flanked angle or ſaliant angle of the baſtion to the oppoſite flank, ought not to exceed 150 toiſes, or even to be equal to ſo many toiſes. If, on the other hand, the line of defence were to be about two-thirds of that length only, or equal to about 100 toiſes, the baſtions would be too near to one another, and too ſmall, which would both increaſe their number in the ſame circuit or enceinte, and leſſen their ſtrength or capability of defence. The length of the great line of defence, in order to render the fire more certain and efficient, is therefore commonly ſuppoſed to be equal to from 120 to 140 toiſes only.

3. All the defences ſhould be as nearly direct as poſſible: for ſoldiers naturally fire directly before them. The lines of defence, therefore, ſhould be either like Count Pagan's, perpendicular to the flanks, or nearly ſo.

4. A fortification ought to be equally ſtrong on all ſides: for if it be not, an enemy may attack it on the weakeſt, and avail himſelf of its inequality of ſtrength.

To theſe maxims we will take the liberty to add a few others, that are not to be found in the writers on fortification, but which we, nevertheleſs, conceive to be entitled to the moſt ſerious conſideration. They are the following, and we are favoured with them by Mr. Glenie.

1. In regular conſtruction, the two flanks in each front ought to be equal each of them to the perpendicular to the exterior ſide of the polygon, or nearly ſo, ſince perpendiculars to the exterior ſides of polygons were introduced into conſtruction for the expreſs purpoſe of obtaining flanking defences. And in regular conſtruction, when it is neceſſary (as it generally is, in order to make field-works ſuit the ground they occupy) to make the two flanks in the ſame front unequal, their ſum or lengths taken together ſhould be equal to twice the perpendicular diſtance from the interſection of the lines of defence to the exterior ſide, or nearly ſo.

Mr. Glenie, in the foregoing paper, has given a very eaſy method of making the flanks in regular conſtruction, either equal to the perpendiculars, or in given ratios to them.

2. The face of the baſtion, in regular conſtruction, ought never to exceed one-fourth part, or two-eighths of the exterior ſide. The conſtruction, which gives each of the flanks in the ſame front equal to the perpendicular, makes the face of the baſtion equal to a fourth part of the exterior ſide very nearly.

3. The flanked angle, or ſaliant angle of the baſtion, ought never to be leſs than an angle of about $71\frac{1}{2}°$, and ſhould never exceed 120°. In Count Pagan's method, however, and that of Mr. Vauban, who has followed him, this angle in a polygon of only 18 ſides is equal to about 123° 7′ 48″; in one of 30 ſides, to 131° 7′ 48″; and in a conſtruction on a right line, or part of a polygon of an infinite or indefinite number of ſides, to 143° 7′ 48″.

4. The angle of the epaule or ſhoulder ſhould not be leſs than an angle of about $108\frac{1}{2}°$, and ought never to exceed an angle of 150°.

5. The angle of the flank ought not to be leſs than an angle of about $99\frac{1}{2}°$, nor greater than one of about 120°.

6. The outward flanking angle, or the angle formed by the lines of defence at their interſection, ought not to be leſs than 120°, nor ever greater than $161\frac{1}{2}°$.

Laſtly. Different polygons have different perpendiculars, which have reſpectively given ratios to the ſides of the polygons. And the perpendicular that truly belongs to any polygon of a given number of ſides, is different from that which belongs to any other polygon of a different number of ſides; the exterior ſide in each of the polygons being ſuppoſed invariable or the ſame. A conſtruction on the ſides of any polygon of a given number of ſides, ought to be made with the perpendicular that peculiarly belongs to it. An inveſtigation, however, of the various perpendiculars that reſpectively belong to various polygons, from the ſquare up to the right line, which may be regarded as part of a polygon of an indefinite or infinite number of ſides, has never as yet been delivered by any writer on fortification; and it now forms the great deſideratum in military conſtruction.

CONSTRUCTIVE Treason, in *Law*, was defined by 25 Edw. III. cap. 2. See Treason.

CONSUALES Ludi, among the Romans, the ſame with Circenses *ludi*. See alſo Circus.

CONSUALIA, in *Antiquity*, feaſts which were held among the ancients, in honour of the god Conſus, *i. e.* Neptune; different from thoſe other feaſts of the ſame deity called Neptunalia.

They were introduced with a magnificent cavalcade, or proceſſion on horſeback; becauſe Neptune was reputed to have firſt taught men the uſe of horſes; whence his ſurname of 'Ιππιος, *Equeſtris*.

Evander is ſaid to have firſt inſtituted this feaſt: it was re-eſtabliſhed by Romulus, under the name of *Conſus*; becauſe it was ſome god under the denomination of Conſus, that ſuggeſted to him the rape of the Sabines. It is ſaid, that it was with a view to this rape, that he formed this inſtitution. This, however, is certain, that it was to this feaſt all his neighbours were invited; when, taking advantage of the ſolemnities and ſacrifices, he ſeized the women. To draw the greater concourſe of people, he gave out that he had found an altar hid under ground, which he intended to conſecrate, with ſacrifices to the god to whom it had been originally erected.

Thoſe who take upon them to explain the myſteries of the heathen theology, ſay, that the altar hid under ground, is a ſymbol of the ſecret deſign of Romulus to ſeize his neighbours' wives.

The conſualia were of the number of feaſts called *ſacred*; as being conſecrated to a divinity. Originally they were not diſtinguiſhed from thoſe of the Circus: whence it is, that Valerius Maximus ſays, that the rape of the Sabines was effected at the games of the Circus.

Plutarch obſerves, that during the days of this ſolemnity, horſes and aſſes were left at reſt, and were dreſſed up with crowns, &c. on account of its being the feaſt of Neptunus Equeſtris. Feſtus ſays, the cavalcade was performed with mules; it being an opinion, that this was the firſt animal uſed to draw the car.

Servius gives us to underſtand, that the conſualia fell on the thirteenth of Auguſt; Plutarch, in the life of Romulus, places them on the eighteenth, and the old Roman calendar on the twenty-firſt of that month.

CONSUBSTANTIAL, in *Theology*, a term of like import with *co-eſſential*; denoting ſomething of the ſame ſubſtance in kind with another. That this is the meaning of the term ὁμοουσιος has been ſhewn by Petavius, Curcellæus, Cudworth, Le Clerc, Clarke, &c. &c.

The orthodox believe the Son of God to be conſubſtantial with the Father.

The term ὁμοουσιος, *conſubſtantial*, was firſt adopted by the fathers of the council of Nice, convened A. D. 325, and conſiſting of 318 biſhops, to expreſs the orthodox doctrine the more preciſely, and to ſerve as a barrier and precaution againſt the errors and ſubtilties of the Arians; who owned every thing excepting the *conſubſtantiality*.

At the Nicene council, Euſebius propoſed a creed, in which he avoided the word ὁμοουσιος, and anathematized every impious hereſy, without ſpecifying any; but his advice was not followed; ὁμοουσιος was inſerted, and the Arian doctrines were anathematized. Diſputes enſued among the biſhops concerning the meaning and the conſequences of the word ὁμοουσιος. Euſebius aſſented to it, declaring at the ſame time in what ſenſe he underſtood it. His ſenſe of *conſubſtantial* was, that the Son of God was not like created beings, but received his exiſtence and his perfections from the father in a different and in an ineffable manner. Others gave other ſenſes to it; and the debate, ſays Socrates, the eccleſiaſtical hiſtorian, (i. 23. et Soz. ii. 18.) was like a battle fought in the dark. Socrates however was a conſubſtantialiſt, ſo far as even to believe that miracles were wrought by the Monks in favour of that doctrine; though he intimates, that the biſhops of each party diſputed about words of which they had no ideas, and charged one another with conſequences and inferences, which neither ſide would own. By the word ὁμοουσιος the Nicene fathers meant, not the ſame numerical or individual ſubſtance, but the ſame generical ſubſtance or ſubſiſtence. As amongſt men, a ſon is ὁμοουσιος with his father, that is, of the ſame human nature; ſo, in their opinion, the Son of God is ὁμοουσιος with the Father, that is, of the ſame divine nature. By this word, therefore, they intended to expreſs the ſame kind of nature, and ſo far a natural equality. But according to them, the natural equality did not exclude a relative inequality; a majority and minority, founded upon the everlaſting difference between giving and receiving, cauſing and being cauſed. They had no notion of diſtinguiſhing between perſon and being; between an intelligent agent, and an intelligent active ſubſtance, ſubſiſtence, or entity. When they ſaid, that the Father was God, they meant that he was God of himſelf, originally, and underived, Θεὸς αγεννητος, and ὁ Θεος. When they ſaid that the Son was God, they meant that he was God by generation or derivation, Θεοςγεννητος. The unity of God they maintained; and they defended it, firſt, by conſidering the father as the firſt cauſe, the only underived and ſelf-exiſting; ſecondly, by ſuppoſing an intimate, inſeparable, and incomprehenſible union, connection, indwelling, and co-exiſtence, by which the Father was in the Son and the Son in the Father; and thirdly, by ſaying, that in the Father and the Son there was an unity of will, deſign, and conſent, and one divine power and dominion, originally in the Father, and derivatively in the Son. In proceſs of time Chriſtians adopted a notion, that the Son was ταυτοουσιος and μονοουσιος, of the ſame individual ſubſtance with the Father and the Holy Spirit; and they ſeem to have done this with a view of ſecuring the doctrine of the unity.

The Arians declared, that the word was God, as having been made God; but they denied that he was the ſame God, and of the ſame ſubſtance, with the Father; accordingly, they exerted themſelves to the utmoſt to aboliſh the uſe of the word. The emperor Conſtantine uſed all his authority with the biſhops to have it expunged out of the ſymbols; but it ſtill maintained itſelf, and is at this day, as it was then, the diſtinguiſhing criterion between an Athanaſian and an Arian.

Sandius will have it, that the word *conſubſtantial* was unknown till the time of the council of Nice; but it is certain it had been before propoſed to the council of Antioch, held A. D. 270, in which Malchion directed and governed, and in which Paul of Samoſata had been condemned; though it had there the fortune to be rejected. Curcellæus, on the other hand, maintains, that it was an innovation in doctrine in the council of Nice, to admit an expreſſion, the uſe whereof had been aboliſhed by the council of Antioch.

According to St. Athanaſius, the word *conſubſtantial* was only condemned in the council of Antioch, inaſmuch as it implied the idea of a pre-exiſtent matter, prior to the things formed of it; now, in this ſenſe, it is certain, the Father and the Son are not conſubſtantial, there having been no pre-exiſtent matter.

In another council, held at Antioch, A. D. 341, conſiſting of about 100 biſhops, the Arians made a creed and left out the term ὁμοουσιος; but wanting it to be approved by both parties, they called the Son the unchangeable image of the eſſence, counſel, and power of the Father, the firſt born of every creature. The diſputes, however, between the conſubſtantialiſts and the Arians, and alſo the Semi-Arians or ὁμοιουσιοι, *i. e.* the homoiouſians, continued to be carried on with great violence, particularly in the Eaſtern part, for ſeveral years. One remarkable difference has been obſerved between the creeds which were propoſed by the contending parties. The conſubſtantialiſts drew up their creed with a view to exclude and diſtreſs the Arians; whereas the Arians had no deſign to diſtreſs the conſubſtantialiſts, but uſually propoſed creeds to which Athanaſius himſelf might have aſſented; ſo that if the compilers were Arians, their creeds were not Arian. The Semi-Arians agreed with the Arians in rejecting the word ὁμοουσιος, but differed from them in exalting the perfections and dignity of the Son higher than the Arians did, and in affirming that he was ὁμοιουσιος, of *like* ſubſtance and *like* to his father in all things. Dr. Clarke's doctrine, in his "Scripture Doctrine, &c." as ſtated by Le Clerc, (Bibl. Choiſ. xxvi. 419.) ſeems to be the ſame with that of the Nicene council, excepting that he uſes not the word "conſubſtantial." Before the end of the fourth century the conſubſtantialiſts differed and diſputed among themſelves, whether in the Trinity there were three hypoſtaſes, or one hypoſtaſis. See Hypostasis and Trinity.

CONSUBSTANTIATION, a tenet of the Lutheran church, with regard to the doctrine of the real preſence of Chriſt, or the manner of the change made in the bread and wine, in the euchariſt; though the term *conſubſtantiation* was ſubſtituted in the room of tranſubſtantiation, at the cloſe of the thirteenth century, by John, ſurnamed Pungens Aſinus, a doctor of the univerſity of Paris.

The divines of that profeſſion maintain, that, after conſecration, the body and blood of our Saviour are ſubſtantially preſent, together with the ſubſtance of the bread and wine; which is called *conſubſtantiation*, or *impanation*.

This notion, as the biſhop of Meaux juſtly obſerves, has all the diſadvantages, which the Romaniſts, and Sacramentarians, charge on one another, without having a ſingle advantage that can be claimed by either. It has all the abſurdity which the latter charge upon the former, inaſmuch as it repreſents the ſame body exiſting in different places, at the ſame time; and inaſmuch as it repreſents a ſubſtance exiſting without its accidents, or under the accidents of another ſubſtance; but has not the advantage of ſimplicity which the Romiſh doctrine has, in interpreting literally the words, "this is my body." On the Lutheran hypotheſis the expreſſion ought to have been, not "this is my body," but "in, with, and under this is my body." For the Lutherans maintain that the bread remains unchanged, and is that which is ſeen, touched, and taſted; but that the body of Chriſt, the ſame which he had upon the earth and has now in heaven, accompanies the bread. Hence it appears, that the words are to be underſtood neither according to the letter, nor according to any figure of ſpeech ever heard of before. It is neither literally Chriſt's body, nor figuratively the ſign or ſymbol of his body; but it is ſomething with which his body is accompanied. The Lutherans, by maintaining this doctrine of conſubſtantiation, were obliged to adopt another hypotheſis not leſs abſurd, *viz.* the ubiquity, or the omnipreſence, and conſequently the immenſity of the body and human nature of Chriſt; hence they were called *Ubiquitarians.* See alſo IMPANATION, TRANSUBSTANTIATION, and LUTHERANISM.

CONSUEGRA, in *Geography*, a town of Spain in New Caſtile, containing two pariſhes and three convents. It belongs to the knights of Malta; 25 miles S.S.E. from Toledo.

CONSUETUDINIBUS ET SERVITIIS, in *Law*, a writ of right, which lies for the lord againſt the tenant that deforceth his lord of the rent, or ſervice due to him, by cuſtom, or tenure, for his land. This compels a ſpecific payment or performance of the rent or ſervice, and there are alſo others, whereby the lord ſhall recover the land itſelf in lieu of the duty withheld.

CONSUL, the appellation that was given to the firſt, or chief, magiſtrate in the Roman government, vulgarly and commonly called the Roman Commonwealth; though it was compoſed of royalty, ariſtocracy, and democracy, as much as the government of Great Britain is, and was, perhaps, in ſeveral reſpects, the moſt energetic and efficient mixture of theſe three ſimple forms that has ever exiſted in the world, particularly for the purpoſes of conqueſt and ſecurity againſt ſubjugation.

After the deſtruction of royalty at Rome, and the expulſion of Tarquinius Superbus, and his family from thence, in the 244th year of the city, a conſular form of government was eſtabliſhed in the 245th year in its ſtead; the people chooſing to have ſome ſhare in the management of public affairs themſelves; they accordingly choſe two officers, or magiſtrates, annually, who were inveſted with ſovereign authority, and were originally called prætores, *a præeundo*, according to ſome writers, but *a præeſſe* according to others. Theſe were afterwards called conſules, *a conſulendo*, becauſe it was their duty to conſult with the ſenate, with the people, and with each other. From their acting as judges, they were called *judices;* or from their poſſeſſing ſupreme command they were denominated by the Greeks' ΥΠΑΤΟΙ. The firſt conſuls were Brutus and Collatinus. The office of the conſuls laſted a year; and if either of them died in the courſe of the year of their conſulate, a new one was to be elected. In the beginning of the republic the conſuls entered on their office at different times; at firſt, on the 23d or 24th of February, (vii. or vi. Kal. Mart.) the day on which Tarquin was ſaid to have been expelled, which was held as a feſtival, and called "regifugium feſtus;" afterwards on the 1ſt of Auguſt, (Kal. Sext.) which was at that time the beginning of the year, *i. e.* of the conſular, not of the civil year, which always began with January:—in the time of the Decemviri, on the 15th of May, (Id. Maii);—about 50 years after, on the 15th of December, (Id. Decemb.);—then on the 1ſt of July, (Kal. Quint.), which continued till near the beginning of the ſecond Punic war, A. U. 530, when the day came to be the 15th of March, (Id. Mart.);—at laſt, A. U. 598, or 600, it was transferred to the 1ſt of January (in Kal. Jan.), which continued to be the day ever after. After this, the conſuls were uſually elected about the end of July, or the beginning of Auguſt. From their election to the 1ſt of January, when they entered on their office, they were called "conſules deſignati," and whatever they did in public affairs, they were ſaid to do it by their "authority," not by their "power." This interval was made ſo long, that they might have time to acquaint themſelves with the duties of their office, and that inquiry might be made whether they had gained their election by bribery. If, upon trial, they were convicted of that crime, they were deprived of the conſulſhip, and their competitors, who accuſed them, were nominated in their place. They were alſo fined, and declared incapable of bearing any office, or of coming into the ſenate, by the Calpurnian and other laws. (Cic. pro Sylla, 17 and 32. Cic. pro Cornel. Muren. 23, &c. Sall. Cal. 18.) On the 1ſt of January, the ſenate and people waited on the new conſuls at their houſes; from whence, being conducted to the capitol, they offered up their vows, and ſacrificed, each of them, an ox to Jupiter; and then began the exerciſe of their office, by holding the ſenate, conſulting it about the appointment of the Latin holidays, and about other things relating to religion. Within five days they were obliged to ſwear to obſerve the laws, as they had done when elected.

The conſuls were at firſt choſen only from among the Patricians, but afterwards alſo from the Plebeians. L. Sextius was the firſt plebeian conſul, and the ſecond year after him Licinius Stolo; from whom the law, ordaining one of the conſuls to be a plebeian, was called "lex Licinia." Sometimes, but rarely, both conſuls were plebeians; the patricians generally engroſſed this honour. The firſt foreigner who obtained the conſulſhip, was Cornelius Balbus, a native of Cadiz; who became ſo rich, that, at his death, he left to each of the citizens, reſiding at Rome, 25 drachmæ, or denarii, *i. e.* 16s. 1¾d.

The legal age for enjoying the conſulſhip (ætas conſularis,) was 43; and whoever was made conſul at that age, was ſaid to be made in his own year; but we meet with ſome few exceptions from this rule. (ſee AGE.) Before any perſon was made conſul, it was neceſſary for him to have gone through the inferior offices of quæſtor, ædile, and prætor. No one could be created conſul a ſecond time till after an interval of ten years. But theſe regulations were not ſtrictly obſerved.

The inſignia of the conſuls were the ſame with thoſe of the kings, except the crown; namely, the toga prætexta, ſella curulis, the ſceptre, or ivory ſtaff, and 12 lictors, with the faſces and ſecuris. He who had the greater number of ſuffrages was called "Conſul prior," and his name was marked firſt in the kalendar; he alſo had the faſces firſt, and uſually preſided at the election of magiſtrates for the next year. All perſons went out of the way, uncovered their heads, diſmounted from their horſes, and roſe up to the conſuls as they paſſed by them. When a prætor happened to meet a conſul, his lictors always lowered their faſces. Valerius, called Poplicola, took away the ſecuris from the faſces; *i. e.* he took from the conſuls the power of life and death, and only left them the right of ſcourging, at leaſt within the city; for without the city, when inveſted with military command, they ſtill retained the ſecuris, *i. e.* the right of puniſhing capitally. Poplicola likewiſe made a law, granting every one a liberty of appealing, from the conſuls to the people; and that no magiſtrate ſhould be permitted to puniſh a citizen, who thus appealed: a privilege which was alſo enjoyed under the kings. The conſuls originally poſſeſſed kingly powers, both in civil and military matters. But afterwards, when the conſuls came to be much employed from home, or abroad in war, and could not be preſent either to hear or determine civil cauſes, there was an officer conſtituted, under the deſignation of *prætor urbanus*, and frequently called by Cicero *prætor Romanus*, with power to judge matters of law between citizen and citizen. And for the convenience and accommodation, in this reſpect, of the great number of ſtrangers that were always at Rome, another officer was appointed to judge cauſes between them, with the appellation of *prætor peregrinus*. And as provinces came to be added to the Roman ſtate, and the number of cauſes was of courſe greatly increaſed, there were eight prætors appointed, which number continued till the time of Julius Cæſar, who raiſed it to ten.

The conſuls, whilſt they remained in Rome, and before they led out Roman armies into the field, were maſters of all public affairs. For all the other magiſtrates, the tribunes of the people alone excepted, were ſubject to them, and bound to obey their commands. They introduced embaſſadors into the ſenate and gave them audience; and they received all letters from the governors of provinces, and from foreign kings, and ſtates. They alſo propoſed to the ſenate the ſubjects of their debates, and directed all the forms that were obſerved in making their decrees. It was equally a duty likewiſe, belonging to their office, to attend to thoſe affairs that were tranſacted by the people; to ſummon, or call together their general aſſemblies; to report to them, when aſſembled, the reſolutions of the ſenate; and to ratify whatever was determined by the greater number. The laws which they propoſed, and got paſſed, were commonly called by their name. The year was named after them, as it uſed to be at Athens, from one of the archons. The conſuls had alſo command over the provinces, and could, when authoriſed by the ſenate, call perſons from thence to Rome, and puniſh them. (See PROVINCE.) Their authority was ſo great, that kings, and foreign nations, in alliance with the republic, were conſidered to be under their protection. In dangerous conjunctures, the conſuls were armed with abſolute power by the ſenate. In all the preparations that were made for war, as well as in the whole adminiſtration, and management of things in the field, they poſſeſſed an authority almoſt abſolute. For to them it belonged to impoſe on the allies whatever ſervices they judged neceſſary or expedient; to appoint the military tribunes; to enrol the legions, and make the neceſſary levies; and to inflict puniſhments in the field on all that were ſubject to their command. In addition to all this, they had the power to expend whatever ſums they might think convenient, or requiſite, from the public treaſure, and were attended for that expreſs purpoſe by a quæſtor, who was always ready to receive and execute their orders.

When a Roman army encamped, the conſular tent was firſt pitched, and the ground on each ſide of it marked out for it, and on the breaking up of a camp, it was the firſt tent that was permitted to be ſtruck; and one entire company of ſoldiers were always ſtationed round it.

When an action had taken place, in which any of the ſoldiers had ſhewn ſignal proofs of courage, the conſul aſſembled the troops together, and commanded thoſe to approach who had diſtinguiſhed themſelves by any eminent exploit. And after beſtowing on each of them ſeparately, or apart, the commendation that was due to that particular inſtance of their valour, and after recounting likewiſe all their former actions that had ever merited applauſe; he then diſtributed among them the following rewards:—To him who had wounded an enemy a javelin:—To him who had killed an enemy, and ſtripped him of his armour, a goblet, if he were in the infantry; and if in the cavalry, a javelin in ancient times, but afterwards furniture for his horſe. Theſe rewards, however, were not beſtowed on ſoldiers, who, in a general engagement, or in the attack of a city, had wounded or ſpoiled an enemy; but on theſe only, who in ſeparate ſkirmiſhes, and when any occaſion offered, in which, though they were not neceſſarily required to engage in ſingle conteſt, threw themſelves voluntarily into danger, and with deſign, provoked the combat. In taking a city by ſtorm, thoſe who firſt mounted the walls, were honoured by the conſul with a golden crown. And thoſe who ſaved the lives of any of the citizens, or of the allies, by covering them from the enemy in the time of battle, received preſents from the conſul, and were alſo crowned by the perſons whom they had thus preſerved.

Although the conſuls were the diſpenſers of military rewards and puniſhments; although they were entruſted with the abſolute direction of the preparations that were made for war, and exerciſed an uncontrolled authority in the field; although their powers and authorities, when they were preſent in Rome, made ſtrangers ſometimes ſuppoſe the government to be a kind of ſimple royalty; they were in truth, ſo dependent in different reſpects, both on the ſenate and the people, that without their aſſiſtance, they were unable to accompliſh any deſign. Armies require a continual ſupply of neceſſaries. But neither corn, nor habits, nor even the military ſtipends, could at any time be tranſmitted to the legions, without an expreſs order of the ſenate. It was alſo the ſenate that either compelled the conſuls to leave their deſigns imperfect, or enabled them to complete the projects that they had formed, by ſending a ſucceſſor into each of their ſeveral provinces on the expiration of the annual term, or by continuing them in their reſpective commands. The ſenate alſo had the power of either aggrandizing and amplifying the victories that were gained, or of depreciating and debaſing them. It was alſo neceſſary for the conſuls, however far they were removed from Rome, to preſerve the good affections of the people. For though the conſuls might make treaties, the power of annulling, or ratifying, reſted entirely with the people. And what was of ſtill greater moment, the conſuls, on quitting their office, were bound to ſubmit the whole of their paſt adminiſtration to the judgment of the people. On this occaſion they made a ſpeech, and ſwore that they had done nothing againſt the laws.

Conſuls were even continued under the emperors after the republic was deſtroyed; but conſul was here little more than an honourable title; which, however, the people were fond of keeping up; as eſteeming it ſome remains of their ancient liberty. As long as the emperors condeſcended to diſguiſe the ſervitude which they impoſed, the conſuls were ſtill elected by the real or apparent ſuffrage of the ſenate. From the reign of Diocletian, even theſe veſtiges of liberty were aboliſhed, and the ſucceſsful candidates, who were inveſted with the annual honours of the conſulſhip, affected to deplore the humiliating condition of their predeceſſors. In the epiſtles which the emperor addreſſed to the two conſuls elect, it was declared, that they were created by his ſole authority. The title of conſul, however, though the real dignity and ſubſtantial power that accompanied it were loſt, was ſtill the moſt ſplendid object of ambition, the nobleſt reward of virtue and loyalty. The emperors themſelves, even after Conſtantinople became the ſeat of empire, who diſdained the feint ſhadow of the republic, were conſcious that they acquired an additional ſplendour and majeſty as often as they aſſumed the annual honours of the conſular dignity. It dwindled for a long time, and at laſt the ſucceſſion of conſuls finally ceaſed, in the 13th year of Juſtinian, A.D. 541, whoſe deſpotic temper might be gratified by the extinction of a title, which admoniſhed the Romans of their ancient freedom: after him, no emperor either created any conſul, or aſſumed the dignity himſelf. Baſil is the laſt in the conſular liſt, for the year 541. By this time, the dignity was depreciated to that degree, that it was conferred on the meaneſt perſons: indeed, Juſtinian endeavoured to retrieve it 25 years after, and created himſelf conſul, but without effect. Indeed, the annual conſulſhip long lived in the minds of the people; they applauded the gracious condeſcenſion of ſucceſſive princes, by whom it was aſſumed in the firſt year of their reign; accordingly Conſtantine created two conſuls, whoſe office it was to exerciſe ſupreme juriſdictions, the one at Rome, the other at Conſtantinople; and three centuries elapſed, even after the death of Juſtinian, before that obſolete dignity, which had been ſuppreſſed by cuſtom, could be aboliſhed by a law of Leo the philoſopher. Afterwards the title was vilified, as we learn from the emperor himſelf.

From the eſtabliſhment of the republic, and the conſulate under L. Jun. Brutus, and L. Tarq. Collatinus, to the conſulate of Baſil, *i. e.* from the year of Rome 244, or 245, 509 years before Jeſus Chriſt, to the year of Rome 1294, the ſpace of 1049 years, the years were accounted by the conſuls; but from the time of Baſil, in the year of Chriſt 541, we find no mention made of conſuls, or conſulates; but the time was then computed by the years of the emperors' reigns, the indictions, and thoſe of the Chriſtian era.

Indeed, for ſome time after the conſulate of Baſil, the years are marked thus; *poſt conſulatum Baſilii*, 1, 2, 3, &c. (See the Faſti Conſulares of M. D'Almeloveen.) That author reckons 1060 pairs of conſuls, beſides the ſubſtitute conſuls, *ſuffecti*, elected to ſupply vacancies by death; and yet there were but 1049 years, and conſequently only ſo many conſulates.

The perpetual conſulates of the Eaſtern emperors, which compoſe the Faſti Byzantini, commenced in the year of Chriſt 567, and ended in 668, in the laſt year of Conſtans.

Conſtantine Pogonatus would have the conſulate inſeparable from the empire; which it continued to be till the time of Conſtantine Porphyrogenetus.

In this form of government the empire and conſulate were ſo cloſely united, that the empreſs Irene would needs aſſume the conſulate when ſhe was only regent of the empire.

But the French kings, thoſe of Italy, and the Saracen princes who commanded in Spain, taking on them the title of conſuls, as well as emperors of Conſtantinople; theſe laſt deſpiſed it, and laid it aſide; ſo that the name was only continued to the magiſtrates of ſome cities, and certain other officers, as is ſhewn by F. Pagi.

Under the emperors there were *ordinary conſuls*, *honorary conſuls*, and *ſuffecti*; which laſt alſo ſubſiſted in the time of the republic.

In the middle age, we find the word conſul uſed for *comes*, count, and proconſul, for viſcount; as is obſerved by Spelman, and De Marca.

And thus conſul, in our law-*books*, ſignifies an *earl*. Bract. lib. i. cap. 8. tells us, that as *comes* is derived from *comitatu*, ſo *conſul* is derived from *conſulendo*: and in the laws of Edward the Confeſſor, mention is made of *vicecomites*, and *viceconſules*.

Consul, at preſent, is uſed for an officer eſtabliſhed by virtue of a commiſſion from the king, and other princes, in the ports and factories of the Levant, on the coaſts of Africa, Barbary, Spain, and other foreign countries of any conſiderable trade; to facilitate and diſpatch buſineſs, and protect the merchants of the nation.

Theſe commiſſions were never granted to perſons, as conſuls of the French nation, under the age of thirty years. When the conſulate is vacant, the moſt ancient of the deputies of the nation were to diſcharge the function thereof, till the vacancy ſhould be filled up by the king.

The conſuls are to keep up a correſpondence with the miniſters of England reſiding in the courts whereon their conſulates depend. Their buſineſs is, to ſupport the commerce and intereſt of the nation; to diſpoſe of the ſums given, and the preſents made, to the lords and principals of places: to obtain their protection, and prevent the inſults of the natives on the merchants of the nation. There are alſo conſuls of other nations eſtabliſhed in the Levant, eſpecially French and Dutch.

Consuls alſo denote judges elected among the merchants and dealers, in ports and trading towns, chiefly in France; to terminate, *gratis*, and on the ſpot, without any proceſs, ſuch differences and demands as may ariſe relating to their merchandizes, bills of exchange, and other articles of commerce.

The firſt juriſdiction of conſuls eſtabliſhed in France, is that of Tholouſe; the edict of whoſe eſtabliſhment bears date 1549, under the reign of king Henry II.; that of Paris followed fourteen years afterwards. By degrees, they were eſtabliſhed in moſt of the conſiderable trading towns in that kingdom.

Consul, *Chief*, or *Premier Conſul*, the firſt or chief of the magiſtrates, who each of them bore the name of conſul in the late conſtitution of France, which has been ſucceeded by its preſent military deſpotiſm. Napoleon Buonaparte, the preſent emperor of France, was appointed chief conſul, in conſequence of the revolution that took place in 1799.

CONSULAR, of or belonging to a conſul: as for example, a conſular camp, a conſular army, the conſular dignity, the conſular authority, and ſo on.

Consular *comitia*, and *medals*. See the ſubſtantives.

CONSULATE, or Consulship, the office of conſul, which was inſtituted by the Romans, in the year of Rome 245, after they expelled Tarquin the Proud.

CONSULTATION, in *Law*, a writ whereby a cauſe, formerly removed by prohibition from the eccleſiaſtical court to the king's court, is returned thither again.

If the judges of the king's court, upon comparing the libel with the ſuggeſtion of the party, find the ſuggeſtion falſe, or not proved; and therefore the cauſe to be wrongfully called from the court-chriſtian; then, upon ſuch deliberation, or conſultation, they decree it to be returned again, and the writ obtained hereon is called a conſultation.

And, even in ordinary caſes, the writ of prohibition is not abſolutely final and concluſive. For, though the ground be a proper one, in point of *law*, for granting the prohibition, yet, if the *fact* that gave riſe to it be afterwards falſified, the cauſe ſhall be remanded to the prior juriſdiction. If, *e. g.* a cuſtom be pleaded in the ſpiritual court, a prohibition ought to go, becauſe that court has no authority to try it; but, if the fact of ſuch a cuſtom be brought to a competent trial, and be there found falſe, a writ of conſultation will be granted. For this purpoſe the party prohibited may appear to the prohibition, and take a declaration, (which muſt always purſue the ſuggeſtion,) and ſo plead to iſſue upon it; denying the contempt, and traverſing the cuſtom upon which the prohibition was grounded; and if that iſſue be found for the defendant, he ſhall then have a writ of conſultation. The writ of conſultation may alſo be, and is frequently, granted by the court without any action brought; when, after a prohibition iſſued, upon more mature conſideration, the court are of opinion that the matter ſuggeſted is not a good and ſufficient ground to ſtop the proceedings below. Thus careful has the law been, in compelling the inferior courts to do ample and ſpeedy juſtice; in preventing them from tranſgreſſing their due bounds; and in allowing them the undiſturbed cognizance of ſuch cauſes as by right, founded on the uſage of the kingdom or act of parliament, do properly belong to their juriſdiction. Blackſt. Com. vol. iii.

CONSUMMATE ESTATE. See TENANT *by curteſy*.

CONSUMMATION, the end, period, or completion, of any work.—Thus, we ſay, the conſummation of all things: meaning the end of the world. By the incarnation, all the prophecies are to be conſummated.

Conſummation of marriage denotes the laſt act of marriage, which makes its accompliſhment.

CONSUMPTION, in *Medicine*, popularly named a *decline*, is a generic term, occaſionally applied to different diſeaſes, the moſt obvious ſymptoms of which are a gradual decline of the ſtrength and functions of the body, and a diminution of its bulk, in conſequence of the decreaſe or conſumption, as it were, of the fat and muſcular parts. From whatever cauſe, therefore, the nutrition of the body is impeded, conſumption will be the conſequence. The nutrition of the body may be impeded either by ſome great internal diſeaſe, which diſturbs the functions, eſpecially that of digeſtion; or by deficiency of nutriment; or by great evacuations or diſcharges of blood, or fluids ſecreted from the blood. Theſe conſiderations have led noſologiſts to treat of conſumption under three diviſions or genera, with the titles of *Phthiſis*, *Tabes*, and *Atrophia*: the two firſt being produced by internal organic diſeaſes; the laſt by the deficiency, or the abſtraction, or corruption, of nutritious matter.

1. *Phthiſis*, Φθίσις, ſignifying *conſumption* in general, is confined to that ſpecies which originates from diſeaſe of the lungs: this form of conſumption being the moſt frequent and fatal. It is defined "emaciation, with hectic fever, cough, and commonly with purulent expectoration." The emaciation is occaſioned by the diſturbance in the function of digeſtion, which the daily fever produces; by the impediment to the function of reſpiration, which the diſeaſed lungs are unable to carry on; and by the great diſcharges by expectoration, ſweating, or diarrhœa, which latter frequently alternate with each other.

2. *Tabes*, which, in the Latin language, is ſynonymous with *phthiſis* in the Greek, has been arbitrarily reſtricted by noſologiſts to that form of conſumption, which is not accompanied by cough. It is defined, "emaciation, with hectic fever." Any local diſeaſe of long continuance, ſuch as abſceſſes, ulcers, &c. which excites a hectic fever, may become the origin of a *tabes*. But the moſt frequent occurrence of tabes is obſerved in ſcrofulous habits, the ſcrofula being always ſlow in its progreſs: and one of the moſt common varieties of tabes ariſes, where ſcrofula attacks the glands of the meſentery. In this caſe emaciation is produced, not only by the diſturbance of functions, and the ſweats of the hectic fever, but by the phyſical impediment to the nutrition of the body, occaſioned by the morbid condition of the meſenteric glands, through which the chyle cannot paſs, in order to enter the thoracic duct, and thence to be poured into the blood-veſſels.

3. *Atrophia*, derived from the primitive particle α, and τρέφω, *nutrio*, implying *defect of nouriſhment*, has been adopted to denote the ſimple emaciation and loſs of ſtrength, which is not accompanied with hectic fever, nor originates from any organic diſeaſe; but depends altogether on the privation, corruption, or abſtraction, of that which would otherwiſe ſupport the ſtrength of the body. It is defined, "emaciation, without fever." Hence atrophia occurs in thoſe who have ſuffered great evacuations, as from ſalivation, hæmorrhage, ſweat, leucorrhœa, &c.; in thoſe from whom nutriment is abſtracted in undue proportion to their ſtrength and digeſtive powers, as in nurſes ſuckling ſtout children, or continuing them at the breaſt too long; and in thoſe whoſe nutriment is corrupted, as the ſalt proviſions, which excite ſcurvy.

For a view of the nature and requiſite treatment of the different kinds of conſumption, ſee the following articles: TABES *Meſenterica* (or Meſenteric Conſumption), and ATROPHY. Savage's Noſol. Method. Claſs x. ord. 1. Cullen's Synopſis Noſol. Claſs i. ord. 4. and Claſs iii. ord. 1.

CONSUMPTION, *Pulmonary*, the *phthiſis pulmonalis* of medical writers, from φθίω, or φθέω, *corrumpo*, *conſumo*, a diſtreſſing and very fatal diſeaſe, diſtinguiſhed by the occurrence of a frequent cough, with expectoration of puriform matter, hectic fever, emaciation, and debility; to which, in the latter ſtages, colliquative ſweats, often alternating with diarrhœa, ſupervene.

In this diſeaſe the number, degree, and progreſs, of the ſymptoms are extremely various, in different caſes. It uſually commences in an inſidious manner, with a ſlight and ſhort cough, which is often little remarked by thoſe affected with it, but ſoon becomes habitual; or with an occaſional cough, which is more ſevere. At the ſame time, the breathing becomes eaſily hurried by any bodily motion, the patient grows leaner, and becomes languid and indolent. In this ſtate he ſometimes continues for a year, or even for two years, without making any complaint, excepting that he is affected by cold more readily than uſual, which frequently increaſes his cough, and produces catarrh. This, however, is ſometimes relieved, is ſuppoſed to have ariſen from cold alone, and therefore gives no alarm either to the patient or to his friends, nor leads them to take any precaution. But upon ſome occaſion of catching cold, as we commonly ſpeak, the cough becomes more conſiderable; is particularly troubleſome, when the patient lies down at night, and in this ſtate continues longer than is uſual in the caſe of a ſimple catarrh. This may more particularly attract attention, if the increaſe and continuance of cough occur during the ſummer ſeaſon.

The cough, in many inſtances, continues for a long time dry, or without any expectoration; frequently, however, it is accompanied, from the firſt, with an expectoration of a blackiſh or blueiſh mucus, or of tough phlegm; the expectoration being generally moſt conſiderable in the morning, in conſequence of the accumulation of the matter during ſleep. This matter becomes by degrees more copious, more viſcid, and more opake; at length of a yellow or greeniſh colour, and of a purulent appearance, ſometimes ſtreaked with blood. As theſe changes take place, and the cough increaſes, the breathing at the ſame time becomes more difficult, and the emaciation and weakneſs go on alſo increaſing. In the female, as the diſeaſe advances, and ſometimes early in its progreſs, the menſes ceaſe to flow; and this circumſtance, although doubtleſs an effect, the ſex themſelves are generally diſpoſed to believe to be the ſole or principal cauſe of the diſeaſe. During this progreſs ſome pain is commonly felt in the thorax, at firſt under the ſternum, eſpecially, or almoſt ſolely, on the occaſion of coughing: but very often there is a pain in one ſide, ſometimes dull and oppreſſive, ſometimes ſharp and ſhooting, and ſuch as to prevent the perſon from lying eaſy upon that ſide. Even when no pain is felt, it generally happens that phthiſical perſons cannot lie eaſily on one of their ſides, the difficulty of breathing being increaſed, and the cough excited by the attempt.

Theſe ſymptoms have ſeldom continued long, before the pulſe becomes frequent, ſometimes to a conſiderable degree, without much of the other ſymptoms of fever. As it proceeds, the ſkin becomes dry and hot, eſpecially the palms of the hands and ſoles of the feet; a circumſcribed fluſh appears on the cheeks; tranſient chills are often felt by the patient, or he is exceedingly ſenſible to cold; and commonly a regular morning and evening febrile paroxyſm takes place, the evening exacerbation being always the moſt conſiderable, and terminating in ſweats during the night.

The mind is generally little or not at all impaired during the progreſs of pulmonary conſumption; ſometimes it is even more acute than in the previous ſtate of health; and the patient is generally confident of recovery, and his ſpirits buoyed up by hope to the laſt extremity. But the gradual loſs of fleſh and ſtrength, the ſharpneſs of the features, the pearly whiteneſs of the eyes, the incurvation of the nails, and ſometimes the loſs of the hair, but too evidently mark the decay of the bodily functions. At length a colliquative diarrhœa, ſometimes occurring together, but moſt commonly alternating, with the night ſweats, contributes ſtill farther to reduce the patient's ſtrength; and death is frequently preceded by œdema of the feet and legs, and aphthæ in the mouth and throat, and occaſionally by delirium.

Great numbers of people are repeatedly expoſed with impunity to the circumſtances which excite conſumption of the lungs; it is only on a conſtitution of a peculiar nature, prediſpoſed to the diſeaſe, that theſe exciting cauſes operate. This prediſpoſition is frequently hereditary, deſcending from parents whom the diſeaſe had attacked, or who had, at ſome period of their lives, been affected with ſome form of ſcrofula. It is marked by a peculiar inſtability and weakneſs of the vaſcular ſyſtem, more eſpecially of the lungs; inaſmuch as the perſon is ſubject to frequent catarrh, and ſpitting of blood. It is alſo diſtinguiſhed by external peculiarities of form and appearance. Perſons poſſeſſing what has been denominated the ſanguine temperament, namely, having fine ſkin, with large veins, ſoft hair, light eyes, a florid complexion, tall and thin perſon, long ſlender neck, narrow cheſt, and projecting ſhoulders, may be conſidered as having the phthiſical prediſpoſition: and thoſe of the ſanguineo-melancholic temperament, combining with the fine ſkin and complexion, and ſlender form of the former, the dark hair and eyes, and dilated pupils of the melancholic temperament. This combination conſtitutes in general a temperament of peculiar beauty; but in the eyes of the medical phyſiognomiſt, a ſenſe of its delicacy is not the leaſt impreſſion which it excites. Phthiſis ſometimes occurs alſo in perſons who may be ſaid to poſſeſs a ſanguineo-phlegmatic temperament, *i. e.* who have the ſlender form and delicate conſtitution, with an habitually pale complexion, and without the diſpoſition to acute inflammation, which belongs to the ſanguine: it occurs occaſionally too in temperaments almoſt entirely melancholic. See TEMPERAMENT.

In thoſe who have a conſtitutional prediſpoſition to the phthiſical ſtate of the lungs, the diſeaſe is excited by various cauſes of irritation in thoſe organs. Thus it is frequently induced by common inflammation of the lungs, or their membranes, by pleuriſy, peripneumony, catarrh, whooping-cough, aſthma, and the cough connected with meaſles; by frequent over-exertion of the lungs in ſpeaking, ſinging, or blowing muſical inſtruments; by inſpiring certain kinds of duſt or vapour; by hæmoptyſis, or ſpitting of blood; by ſudden variations of the atmoſpheric temperature; by compreſſing the cheſt by tight bandages, &c. Of ſome of theſe cauſes we ſhall ſpeak more particularly.

A great majority of the caſes of pulmonary conſumption is referred, by the ſufferers, to a common cold or catarrh as their origin; the expectoration of mucus, which belongs to catarrh, being gradually changed to an expectoration of pus, and a hectic fever ſupervening. But Dr. Cullen thinks that this ſuppoſition is not eaſily to be admitted; inaſmuch as catarrh is properly an affection of the mucous glands of the trachea and bronchiæ, analogous to coryza, and leſs violent kinds of ſore-throat, which very ſeldom terminate in ſuppuration. He is of opinion, that the apparent catarrh, in ſuch inſtances, was in fact the beginning of phthiſis, for which it may have been miſtaken, as the reſemblance between the two is ſo great as commonly to preclude the means of diſcrimination. This difficulty, however, he admits, preſſes upon us the neceſſity of paying minute attention to every catarrhal cough, eſpecially in thoſe who bear marks of the temperament which is prediſpoſed to conſumption. This obſervation has been inculcated, indeed, from ancient times. "Quod ſi mali plus eſt," ſays Celſus, "et vera phthiſis eſt, *inter initia* protinus occurrere neceſſarium eſt; neque enim facile hic morbus, cum inveteraverit, evincitur." lib. iii. cap. 22. The attention of friends and parents cannot, indeed, be too ſtrongly urged upon this point; to neglect the ſlighteſt catarrhal affection, which continues longer than the uſual ſhort period of a few days, is to neglect the only period of ſuppreſſing a diſeaſe, which almoſt invariably tends to fatality.

Hæmoptyſis, or ſpitting of blood, is enumerated among the cauſes of conſumption, and certainly very frequently precedes it. But this occurrence may, perhaps, be conſidered ſtill more than catarrhal ſymptoms, as a ſign of the commencement, and not a cauſe, of the diſeaſe; more eſpecially when it occurs independently of external violence. Numerous inſtances of hæmoptyſis have occurred, from blows and wounds, in which ulceration did not enſue, or at leaſt was of ſhort duration, and did not materially injure the conſtitution. But when it comes on without any obvious external cauſe, and eſpecially in perſons of one or other of the *temperaments* already deſcribed, ulceration, expectoration of pus, and all the diſtreſſing ſymptoms of phthiſis are generally to be apprehended. In ſuch caſes, there is either a peculiar tenderneſs of the vaſcular ſyſtem in the lungs; or, what is perhaps more generally the fact, an incipient obſtruction, as tubercles, which render the ſmall veſſels liable to give way, when the circulation through them is increaſed by any exertion, or receives an irregular impetus from the action of coughing, occaſioned by cold. In this way catarrh may lay the foundation of phthiſis. Spitting of blood, however, if not among the firſt ſymptoms, very frequently occurs in the courſe of the diſeaſe, eſpecially in the ſtage of purulent expectoration.

When inflammation of the lungs terminates in extenſive ſuppuration, producing one or more collections of purulent matter, termed *vomicæ*, the great irritation often produces hectic fever, which, together with the expectoration of pus, continues after the vomicæ burſt, and the patient is cut off with the ordinary train of ſymptoms belonging to phthiſis.

Perſons who are occupied in various employments, by which the air they breathe is contaminated with various ſubſtances, in the form of a fine powder, are peculiarly liable to be ſeized with phthiſis. Thus hair-dreſſers, bakers, maſons, bricklayers'-labourers, laboratory-men, coal-heavers, and chimney-ſweepers, are frequently ſubject to the moſt obſtinate pulmonic diſeaſes; as are alſo, in an equal degree, the dreſſers of flax and feathers, and the workmen in the warehouſes of leather-ſellers. Many perſons, thus engaged, ſtruggle a long time with a conſtant, hard, troubleſome cough, which at length terminates in conſumption. See Willan on Diſeaſes in London, p. 301.

The exanthematous diſeaſes, ſuch as ſmall-pox and meaſles, the latter of which, more particularly, often lays the foundation of conſumption, ſeem to operate by occaſioning ſome morbid change in the conſtitution, which may be conſidered rather as a prediſpoſition than an actual ſtate of diſeaſe. Dr. Cullen attributes this change to an acrimony left in the fluids by theſe exanthemata, which he believes to be the ſame with the acrimony which prevails in ſcrofula. But if we would avoid hypothetical language, all that can be ſaid is, ſimply, that a prediſpoſition to phthiſis and to ſcrofula is occaſioned by theſe diſeaſes. The meaſles, indeed, may not only induce the prediſpoſition, but, by the irritating cough which it leaves behind, may actually occaſion a conſumption of the lungs.

The venereal diſeaſe, or the irritation of the mercurial medicines neceſſary for its cure, or both combined, appear alſo to excite a prediſpoſition, and lay the foundation of conſumption.

Dr. Cullen has enumerated, among the exciting cauſes of phthiſis pulmonalis, and as the moſt frequent of them all, tubercles in the lungs. In the majority of caſes theſe undoubtedly exiſt; but we muſt conſider them as conſtituting the eſſential part of the diſeaſe itſelf, and, if not originally induced by ſome of the cauſes above enumerated, excited into a ſtate of activity by ſome one of them, perhaps moſt frequently by the common catarrh. Of the pulmonary tubercles, the beſt morbid anatomiſt of the times gives the following account.

There is no morbid appearance, he ſays, ſo common in the lungs as that of tubercles. Theſe conſiſt of rounded, firm, white bodies, interſperſed through their ſubſtance. They are, I believe, formed in the cellular ſtructure, which connects the air-cells of the lungs together, and are not a morbid affection of glands, as has been frequently imagined. There is no glandular ſtructure in the cellular connecting membrane of the lungs; and on the inſide of the branches of the trachea, where there are follicles, tubercles have never been ſeen. They are at firſt very ſmall, being not larger than the heads of very ſmall pins; and in this caſe are frequently accumulated in very ſmall cluſters. The ſmaller tubercles of a cluſter probably grow together, and form one larger tubercle. The moſt ordinary ſize of tubercles is about that of a garden pea; but they are ſubject in this reſpect to much variety. They adhere pretty cloſely to the ſubſtance of the lungs, and have no peculiar covering or capſule, and have little or no vaſcularity. When cut into, they are found to conſiſt of a white ſmooth ſubſtance, having great firmneſs, and often contain in part a thick curdly pus. But when the pus is in conſiderable quantity, it is thinner, and reſembles very much the pus from a common ſore. In cutting into the ſubſtance of the lungs, a number of abſceſſes is ſometimes found, from pretty large tubercles having advanced to a ſtate of ſuppuration. In the interſtices between theſe tubercles, the lungs are frequently of a harder, firmer texture, with the cells in a great meaſure obliterated. The texture of the lungs on many occaſions, however, round the boundaries of an abſceſs, is perfectly natural.

I have ſometimes, Dr. Baillie continues, ſeen a number of ſmall abſceſſes interſperſed through the lungs, each of which was not larger than a pea. The pus in theſe is rather thicker than what ariſes from common inflammation, and reſembles ſcrofulous pus. It is probable that theſe abſceſſes have been produced by a number of ſmall ſcattered tubercles taking on the proceſs of ſuppuration. The lungs immediately ſurrounding theſe abſceſſes are often of a perfectly healthy ſtructure, none of the cells being cloſed up by adheſions. See Baillie's Morbid Anatomy, p. 66, *et ſeq.*

This accurate delineation of the condition of the lungs in the laſt ſtage of conſumption, ſufficiently evinces the impoſſibility of a cure by medicine, and may contribute farther to enforce an attention to its earlieſt ſymptoms.

It muſt not be omitted, however, that although the ſlighteſt ſymptoms of catarrh often prove the commencement of a fatal phthiſis; on the other hand, catarrh does occaſionally put on the appearance of phthiſis, yet terminate well. Dr. Willan obſerves, in his "Reports on the Diſeaſes in London," "many perſons who had catarrhal coughs in March, were farther affected with ſpitting of blood, thick, viſcid expectoration, pains within the cheſt, hectic fever, and diarrhœa, interchanging with night-ſweats, but recovered notwithſtanding in the month of April." He concludes "that ulcerations in the lungs had not been produced, and that the expectorated fluid, ſo alarming in its appearance, was perhaps only compoſed of a puriform ſecretion, and an increaſed diſcharge of mucus, circumſtances uſual under other membranous inflammation." Reports, p. 4 and 147. But it muſt be added, that diſſection has ſhewn, that even this condition of lungs has proved fatal, with the uſual ſymptoms of phthiſis.

To aid in diſtinguiſhing whether the matter expectorated be pus, or mucus only, ſeveral teſts have been propoſed; which, taken together, may afford us the means of an accurate concluſion. 1. The colour; mucus being naturally tranſparent, and pus always opake. When mucus becomes opake, as it ſometimes does, it becomes white, yellow, or greeniſh; but the laſt mentioned colour is hardly ever ſo remarkable in mucus as in pus. 2. The conſiſtence; mucus is more viſcid and coherent, ſo as not readily to be diffuſed in water; pus is more readily friable, being broken into ragged fragments by a little agitation in water. 3. The ſmell; no odour is in general perceived in mucus, but frequently in pus. 4. The ſpecific gravity; it being uſual for the mucus of the lungs to ſwim on the ſurface of water, and for pus to ſink in it; but in this we may be deceived, as pus which has entangled a great deal of air may ſwim, and mucus that is free from air may ſink. 5. The mixture which is diſcernible in the matter brought up; for if a yellow or greeniſh matter appears ſurrounded with a quantity of tranſparent or leſs opake and leſs coloured matter, the more ſtrongly coloured may be generally conſidered as pus. 6. Chemical teſts. Mr. Charles Darwin's experiments ſhewed that the vitriolic acid diſſolves both mucus and pus, but moſt readily the former; that if water be added to ſuch a ſolution of mucus, this is ſeparated, and either ſwims on the ſurface, or, divided into flocculi, is ſuſpended in the liquor; whereas, when water is added to a like ſolution of pus, this falls to the bottom, or by agitation is diffuſed ſo as to exhibit an uniformly turbid liquor. Again he ſhewed, that a ſolution of cauſtic potaſs, after ſome time, diſſolves mucus, and generally pus; and if water be added to ſuch ſolutions, the pus is precipitated, but the mucus not.

With reſpect to the *prognoſis* in conſumption, its tendency in general muſt be conſidered as extremely bad. In conſtitutions, where all the delicacy of the temperaments before deſcribed is obſerved, and more eſpecially if an hereditary prediſpoſition can be traced, the moſt trivial ſymptoms are alarming. The particular degree of danger muſt be eſtimated from theſe circumſtances, from the mode in which the diſeaſe commenced, from its duration, and the ſlowneſs or rapidity of its progreſs, the number and degree of the ſymptoms preſent, and the effects which medicine has already produced. The following aphoriſms, the reſult of Dr. Cullen's obſervation, are worthy of attention.

“ A phthiſis pulmonalis, from hæmoptyſis, is more frequently recovered from, than one from tubercles.

“ A phthiſis from a ſuppuration, in conſequence of pneumonic inflammation, is that which moſt rarely occurs in this climate; and a phthiſis does not always follow ſuch ſuppuration, when the abſceſs formed ſoon breaks, and diſcharges a laudable pus: but, if the abſceſs continue long ſhut up, and, till after a conſiderable degree of hectic has been formed, a phthiſis is then produced, equally dangerous as that from other cauſes.

“ A phthiſis from tubercles has, I think, been recovered: but it is, of all others, the moſt dangerous; and, when ariſing from a hereditary taint, is almoſt certainly fatal.

“ The danger of a phthiſis, from whatever cauſe it may have ariſen, is moſt certainly to be judged of by the degree to which the hectic and its conſequences have arrived. From a certain degree of emaciation, debility, profuſe ſweating, and diarrhœa, no perſon recovers.

“ A mania coming on, has been found to remove all the ſymptoms, and ſometimes has entirely cured the diſeaſe; but, in other caſes, upon the going off of the mania, the phthiſis has recurred, and proved fatal.

“ The pregnancy of women has often retarded the progreſs of a phthiſis, but commonly it is only till after delivery, when the ſymptoms of phthiſis return with violence, and ſoon prove fatal.” Firſt Lines, parag. 898.

Treatment. It will readily appear, from what has been ſaid above, that the cure of pulmonary conſumption muſt be exceedingly difficult; in the latter ſtages, perhaps impoſſible. Many inſtances, however, have occurred, where the attention of the patient to the incipient ſymptoms, and his early adoption and ſteady purſuit of proper meaſures, have averted the fatality of the diſeaſe. When it is deeply rooted, alleviation of the ſufferings is all that can be hoped for.

The treatment of a beginning conſumption will depend much upon the peculiar conſtitution of the patient, as well as on the nature of its origin, and of the ſymptoms which it exhibits; but moſt particularly upon the prevalence of an inflammatory diſpoſition, or of a general debility of the habit; theſe oppoſite ſtates being both accompanied by great irritability; and the principal indications will be to diminiſh the inflammatory action and irritability; and in the latter ſtate, juſt mentioned, to avoid debilitating meaſures, and to ſupport the ſtrength as much as is conſiſtent with the inflammatory irritation that may exiſt.

Where there is conſiderable ſtrength, and a complexion ſtill florid, if there is much pain in the cheſt, or if the pulſe be quick and ſharp, perhaps ſmall bleedings from the arm may be reſorted to, and occaſionally repeated; or blood may be drawn from the cheſt, near the ſeat of the pain, by means of leeches or cupping. But this diſcharge ſhould be always effected after a cautious examination of the circumſtances; for the debility which is apt but too ſpeedily to enſue, may be thus accelerated, and, with it, the worſt ſymptoms of the diſeaſe. It is now well underſtood, that the appearance of the buffy coat on the blood drawn, is by no means alone an evidence of the neceſſity of drawing more; for it will appear in phthiſis, nearly as long as the arteries have power to propel it. The old doctrines reſpecting the buffy coat, have doubtleſs led to much practical error; but no one now conſiders pregnancy a diſeaſe which requires conſtant blood-letting; or uſes the lancet in the hot ſtage of an intermittent fever, although under both theſe circumſtances, the buffy coat is conſtantly found. In conſumption occurring, as it moſt commonly does, in delicate habits, the practice of repeated veneſection decidedly accelerates the fatal courſe of the diſeaſe. Bliſters, on different parts of the cheſt, will better anſwer the purpoſe of relieving a local inflammatory diſpoſition. Iſſues and ſetons have a ſimilar effect, but the conſtant diſcharge tends to debilitate, and the irritation to counteract, in ſome meaſure, the good effects of the evacuation.

During the uſe of bliſters, or other local diſcharge, the internal uſe of medicines, which have been denominated refrigerant, may be alſo reſorted to with ſome advantage; ſuch are acids, eſpecially the vegetable, and certain neutral ſalts, as cryſtals of tartar, nitre, &c. The laſt named ſalt has been ſtrongly recommended by Dr. Dickſon, (ſee Med. Obſ. and Inquiries, vol. iv. p. 208.) eſpecially where there is hæmoptyſis, adminiſtered in ſmall doſes frequently; “ when given early in an hæmoptöe,” he ſays, “ I can almoſt equally depend upon it, as upon the cortex peruvianus in a genuine intermittent.” But general experience does not warrant this encomium to its extent. We believe the digitalis to be the moſt efficacious medicine, in repreſſing that inflammatory action of the arterial ſyſtem at large, and of the pulmonary arteries in particular, which commonly goes on at the commencement of phthiſis, whether accompanied by ſpitting of blood or not. The latter it commonly ſuppreſſes, and we have frequently ſeen a febrile irritation, bordering on hectic, attended with a ſharp and quick pulſe, a dry ringing cough, and commencing emaciation, ſpeedily ſubſide under its adminiſtration. The digitalis may be given in combination with the acids, or with nitre, in a mucilaginous liquid. The ceruſſa acetata, or acetite of lead, was formerly employed in conſiderable doſes, eſpecially by the continental phyſicians, with the view of counteracting inflammatory action, and of ſuppreſſing hæmoptyſis. The medicine, it would appear, is poſſeſſed of ſome efficacy; but the danger of inducing paralyſis, and colica pictonum, and other effects, which reſult from the poiſon of lead, is ſufficient to deter us from its uſe. Where the inflammatory action is high, we ſhould be cautious in employing opiates, with a view to allay the cough; as, in ſuch caſes, opium in any form proves too ſtimulating; but where there is languor and debility, and leſs of the ſanguine temperament, and the cough extremely haraſſing, opiates may be employed with benefit; they will ſave the ſtrength of the patient, by appeaſing the inceſſant irritation of coughing, which tends to wear him down, and deprive him of ſleep.

Medicine, however, will not alone ſecure the patient from the deleterious progreſs of the diſeaſe. He will be required to pay ſtrict attention to his diet, and to every external circumſtance that can influence the functions of the body. His meat and drink, his cloathing, his exerciſe, his ſleep, and even his amuſements, muſt be regulated with a rigid correctneſs, ſo that the whole may combine, with medicine, to accompliſh the ſame object, that of ridding the conſtitution of a diſeaſe of fatal tendency, and reſtoring it to its healthy condition. Diet, regimen, and medicine, muſt become, as it were, the buſineſs of the patient. He muſt regulate his life chiefly upon this principle; that every thing which can heat or irritate the body, or excite any increaſed or irregular action of the arterial ſyſtem, muſt be ſhunned; and every meaſure which can ſupport the conſtitution, without infringing on the laſt-mentioned precept, zealouſly adopted.

The diet of the conſumptive, in the early ſtage, of which we now ſpeak, ſhould be light and nouriſhing, and ſuch as is found to be adapted to his digeſtive powers. Animal food
ſhould

ſhould be avoided; and vegetable matters, in the various forms of preparation, with the ripe ſaccharine and ſub-acid fruits, and milk, be made the excluſive nouriſhment of the patient. Milk is particularly ſerviceable, as being very nutritious, and eaſily digeſtible, without ſtimulating the ſyſtem, and ſhould be conſidered as the baſis of the patient's diet. In ſome habits, however, where the digeſtive powers are feeble, or where there is a peculiar idioſyncraſy, cow's milk is not readily digeſted; a load at the ſtomach, or aceſcency, or head-ach, enſue after it is taken. In ſuch caſes, the whey which is produced by ſeparating the cheeſy part, or the butter-milk which is left after the ſeparation of the oily part, or butter, may be ſubſtituted with advantage. Or the patient may have recourſe to the lighter milk of the goat or the aſs, which contains a ſmaller proportion of thoſe heavy parts. The acidity which milk occaſions in the ſtomach of ſome people, may be occaſionally corrected by the admixture of lime-water. Some of the amylaceous preparations from vegetables, may be uſed in conformity with this plan, ſuch as the arrow-root, tapioca, &c.; and it is ſcarcely neceſſary to add, that with theſe, as with all other food, wine, ſpirits, and fermented liquors, muſt be moſt ſtudiouſly avoided. A mucilaginous vegetable has lately been introduced, which, in feeble habits, ſeems calculated to aſſiſt this plan; namely, the lichen iſlandicus, which may be taken boiled in milk, and which, with its nutritive qualities, combines a very mild tonic power, which ſomewhat aids the digeſtion.

While every thing is done, by means of medicine and diet, to repreſs inflammatory action, while we moderately ſupport the ſtrength, another meaſure, ſtill more efficacious, ſhould be adopted, by thoſe who have the power; they ſhould remove to meet the winter in a warm and more equable climate. Cold, but eſpecially ſudden viciſſitudes of cold and heat, appear to be the moſt inimical circumſtances to a beginning conſumption; and there are many living teſtimonies of the benefits which have been derived from an *early* viſit to a more genial atmoſphere. Portugal, the ſouth of France, and Italy, have been reſorted to, as well as the more regular and moderate climates of Madeira and St. Helena. Where theſe countries cannot be viſited, ſome parts of our own iſland may be tried, as being milder than the reſt; as Devonſhire, and the neighbourhood of Briſtol; which latter place poſſeſſes the additional advantage of a wholeſome tepid water. Inſtances of the inefficacy of all theſe places, are, indeed, but too numerous; but much of this is to be attributed to the patients themſelves. They perſiſt in waiting the reſult of time, or of the leſs efficacious means of relief, until relief is altogether beyond their reach. "It ſeems too often to be the fate of conſumptive patients," ſays Dr. Fothergill, "to do that laſt which they ought to have done firſt; and, by this prepoſterous conduct, ſhorten their own lives, and afflict all who have any regard for them." (Med. Obſ. and Inq. vol. v. p. 369.) The ſame intelligent phyſician affirms, that the Briſtol water is, in his opinion, an efficacious medicine, and that he has "often found it of ſignal benefit to conſumptive patients;" but "it is before the approaches to a confirmed phthiſis that patients ought to repair to Briſtol; otherwiſe, a journey thither will be, not only without benefit, but will be probably detrimental." Ibid. Thoſe who have viſited the pump-room at the hot-wells, muſt have ſeen, with pity, the hopeleſs condition of the poor creatures who are dragged thither, to their perſonal detriment, and the diſcredit of an uſeful medicine.

Exerciſe, by various modes of geſtation, has been frequently employed as a remedy for conſumption. Sydenham, indeed, aſſerted, that riding on horſeback is as effectual in the cure of phthiſis pulmonalis, as the bark in agues, or mercury in the venereal diſeaſe, provided the journeys be long enough. An example is related in Dr. Darwin's "Zoonomia," vol. ii. (the caſe of the late ingenious Dr. Currie of Liverpool) in which an hereditary phthiſis was removed, by perſevering in a daily journey; at firſt in an eaſy carriage, and ſubſequently, as the ſtrength increaſed, alternately in the carriage and on horſeback. Some phyſicians, however, are of opinion, that exerciſe on horſeback is rather pernicious, than otherwiſe, in phthiſis. (See Dr. Dickſon's paper, before quoted.) *Sailing* ſeems to be conſidered at preſent as the moſt efficacious mode of geſtation, eſpecially if a long voyage is taken, which is a double recommendation of the removal to a warmer climate. As a ſort of ſubſtitute for this kind of gentle motion, *ſwinging* has been recommended as a remedy for phthiſis, and Dr. Carmichael Smith has written a treatiſe in its favour. In the uſe of any, or all theſe modes of gentle exerciſe, however, the ſame precept muſt be purſued; they muſt be reſorted to *early* in the diſeaſe.

If the plan, now detailed, has not been adopted in ſuch time and mode, as to have checked the diſeaſe; if it has, therefore, advanced to the confirmed ſtate, with purulent expectoration, hectic fever, and profuſe night ſweats; the principal object of medicine becomes merely palliative, and confined to the alleviation of urgent ſymptoms. If the cough is exceedingly urgent, opiates may be adminiſtered more liberally than in the early ſtage. At this period, ſome of the more ſtimulating expectorants are employed by ſome practitioners, with a view to facilitate the diſcharge of the matter which loads the lungs; ſuch as the oxymel, or other preparation of ſquills, the various balſams, and ſome of the gum-reſins. But the experience of the moſt obſerving phyſicians has decided againſt the utility of theſe heating drugs. (See Dr. Fothergill, loc. cit. Dr. Cullen, loc. cit.) There may be occaſional circumſtances in particular conſtitutions, where the objections may not exiſt, as in a cold phlegmatic habit, or where there is conſiderable debility of circulation, with little inflammatory tendency; but theſe are not common. The colliquative ſweats and diarrhœa frequently alternate with each other, and medicines which relieve the one, are liable to increaſe the other. The diluted ſulphuric acid has a conſiderable influence over the night ſweats, and opium is an efficacious medicine againſt the colliquative diarrhœa. But the opium ſeems to favour the occurrence of the perſpirations, and the acid tends to excite the action of the bowels. Theſe medicines, therefore, muſt be combined, or uſed ſingly and alternately, according to the circumſtances of the caſe. Opium may be alſo given by way of enema, when the diarrhœa is obſtinate.

Some practitioners, preſuming that the hectic fever, and the whole ſeries of phthiſical ſymptoms, were dependent on debility alone, have recommended the uſe of tonic medicines, and a generous diet, in the ſtate of confirmed phthiſis; and ſeveral caſes are on record, in which this plan appears to have been attended with ſucceſs. (See Dr. May's Papers, Lond. Med. Journ. vol. ix. and xi.) But we have already obſerved, ſupported by the authority of Dr. Willan, that catarrhal affections occaſionally put on the ſymptoms of phthiſis, and recover under the ordinary means. There are alſo caſes of this ſort, in which there is, we believe, no ulceration, but only a purulent ſecretion from the membranes, which nevertheleſs terminate fatally, with the worſt ſymptoms of phthiſis; and perhaps it is in ſuch caſes, that a tonic treatment is actually ſucceſsful. But we have no means of diſtinguiſhing theſe caſes from the more general inſtances, in which abundant experience has taught us, that all ſtimulating or corroborant medicines and food tend to augment the cough and expectoration, to increaſe the hectic fever, and therefore to accelerate the deſtruction of the conſtitution, even in the laſt ſtages.

Emetics, repeated daily, have alſo been recommended, as a remedy for phthiſis. They afford, we believe, a temporary relief to the reſpiration and cough, but nothing more. On the contrary, the continued repetition of ſuch an irritation, and ſuch a derangement of the natural action of the ſtomach, neceſſarily tends to debilitate and impair the functions of this viſcus, and to weaken the conſtitution at large.

Before we conclude, we cannot omit mentioning an illuſion, which was foſtered in the minds of ſome enthuſiaſtic phyſicians, after the diſcovery of the compoſition of atmoſpheric air by the chemiſts. It was found that oxygen was the great ſtimulus of life, and the ſource of the ſalutary change of the blood, which is marked by its florid colour. From the general florid colour of the blood of the phthiſical, it was ſuppoſed that conſumption was occaſioned by a general hyper-oxygenation of the ſyſtem; and hence, by an eaſy inference, the breathing of an air, in which the proportion of oxygen was diminiſhed, by the addition of ſome azotic air, ſuch as carbonic acid gas, or carbonated hydrogen, was ſuggeſted as a probable remedy for conſumption. Caſes were even publiſhed, illuſtrative of the extraordinary efficacy of this new medicine. But the light of experience has opened the eyes of the viſionary, and the phantom has diſappeared. It has even been ſhewn by the experiments of the French chemiſts, that the abſorption of oxygen, or, at leaſt, its diſappearance in the lungs, is influenced principally by the ſtate of the body, and not by the proportion exiſting in the air which is inſpired.

Consumption, *meſenteric.* See Tabes *meſenterica.*

Consumption, in *Farriery,* is alſo a diſeaſe incident to horſes, conſiſting in waſte of muſcular fleſh, attended with a ſlow fever. In this diſorder bleeding in ſmall quantities is recommended: mercurial purges, and a powder of native cinnabar, gum guaiacum and nitre, of each one pound, in the quantity of an ounce twice a day; ſpring graſs, and ſalt marſhes, are alſo of great ſervice, when there is any proſpect of a recovery. See Condition.

CONSUS. See Consualia.

CONTA, in *Geography,* a river of Italy in Genoa, which runs into the ſea near Albenga.

CONTACT, (from the Latin *contactus,*) means the meeting, or mutual touching of two things. The word is univerſally uſed in the common affairs of life, as well as in ſcientific ſubjects.

In geometry a line is ſaid to touch another line, or a ſurface, or a ſolid; and a plane figure, or ſurface, is ſaid to touch another ſurface or a ſolid, when the former meets the latter; but, being produced, does not cut it. Thus amongſt the definitions of the third book of Euclid's "Elements of Geometry," a right line is ſaid to touch a circle, when meeting with the ſame, and being produced, it does not cut it. Alſo two circles are ſaid to be in mutual contact when they meet, but do not cut each other. Thus the mathematical meaning of the word contact is clear and definite, nor can any doubt ariſe in the ſpeculative mind concerning the nature of it; the abſtract ideas of a line, of a ſurface, or of a ſolid, being perfect and independent on any phyſical qualities of a doubtful or uncertain nature.

The contact of two ſpherical bodies is only in one point; and the ſame holds of a tangent and the circumference of a circle. See Tangent. Hence, becauſe very few ſurfaces are capable of touching in all points, and the coheſion of bodies is in proportion to their contacts; thoſe bodies will ſtick faſteſt together, which are capable of the greateſt contact. The contact of curve lines or ſurfaces, with either ſtraight or curved ones, is only in points; and yet theſe points have different proportions to one another, as Mr. Robartes has ſhewn in the Philoſ. Tranſ. vol. xxvii. p. 470, or Abr. vol. iv. p. 1.

In mechanics and in philoſophy the contact between two bodies is ſaid to take place, when one body, being brought near another body, cannot be approached nearer to it without, in ſome meaſure, affecting its ſtate, be it of motion or of reſt. Thus a ſtone, being gradually moved towards another ſtone, is ſaid to come in contact with it, when its progreſs is either abſolutely, or partially, obſtructed by that other ſtone. Or, if they be both at reſt, and contiguous to each other, they are ſaid to be in contact, when one ſtone cannot be moved towards the other, without either urging the other forward, or being ſtopped by it, or laſtly without making an impreſſion upon its ſurface. The ſame thing muſt be underſtood of the contact between any two other bodies. But the great queſtion in philoſophy is, to determine whether the bodies which thus hinder, or affect, each other's ſtate of reſt or motion, do actually come in contact with each other's ſurface in the ſtrict mathematical ſenſe, or they exert that hindrance, oppoſition, reſiſtance, &c. in virtue of a repulſive power, which acts at a certain indefinite ſmall diſtance from their ſurfaces. This queſtion ſeems, at firſt ſight, to be eaſily determined; but, when duly conſidered, it will be found to involve certain properties of matter in general, and certain effects, which, in the preſent ſtate of knowledge, are far from being thoroughly underſtood, or ſufficiently examined.—The reaſons which ſuggeſted the above-mentioned doubts, concerning the contact of bodies, and the anſwers which may be offered in elucidation of the ſubject, being fully deſerving of notice, we ſhall now endeavour to ſtate them in a regular and compendious manner.

Sir I. Newton, having placed a glaſs lens of a figure ſlightly convex, upon the flat ſurface of another glaſs, and having preſſed the one againſt the other, obſerved certain coloured rings formed between the two glaſſes, and concentric with the point of contact in the middle of the glaſſes, which point was marked by a colourleſs dark ſpot. He farther obſerved, that thoſe rings of priſmatic colours, and the dark central ſpot, became larger when the glaſſes were preſſed harder againſt each other, and became diminiſhed in ſize when the preſſure was diminiſhed.—From the known figure of the glaſſes employed in this experiment, it is evident that a certain ſpace or a film of air muſt remain between their contiguous ſurfaces; that this ſpace, or film of air, became thinner when the glaſſes were preſſed hard againſt each other, and *vice verſâ;* laſtly, that at the centre, where the glaſſes may be preſumed to have been in real contact, the want of ſpace, or of air, rendered that ſpot colourleſs. In this experiment it is ſuppoſed, that the colours are owing to the ſpace or film of air between the glaſſes; hence the central ſpot exhibits no ſuch colours; and therefore, that when any priſmatic colours appear between the contiguous ſurfaces of two glaſſes, their contact cannot be perfect. Nearly the ſame thing is obſerved when two flat pieces of glaſs are preſſed againſt each other; priſmatic colours being likewiſe ſeen between them, though not in rings, but in rows, which aſſume various directions, according as the preſſure may happen to alter the ſurfaces of the glaſſes. And theſe colours cannot be made to diſappear without the application of an enormous degree of preſſure; hence it is inferred, that, though of two bodies one may ſupport the other, or puſh it forward, yet their contact may not be perfect. Profeſſor Robiſon reckons the force with which two pieces of glaſs muſt be preſſed againſt each other, in order to produce a perfect contact, as equivalent to the preſſure of 1000 pounds for every ſquare inch of ſurface; ſo that if two pieces of glaſs ſtrike againſt each other, without exerting a preſſure equal to 1000 pounds per ſquare inch of ſurface, they may affect each other's motion, and yet not come actually in contact. In conſequence of the above facts and obſervations it is ſuppoſed, that a repulſive power exiſts on the ſurfaces of bodies, and that this power is extended to a very ſmall and inappreciable diſtance beyond the ſurface.

Another argument to prove the exiſtence of the above-mentioned reſiſting power on the ſurfaces of bodies, is derived from the phenomena exhibited in an electrical experiment.—When an electric jar is diſcharged through a metallic chain in a darkened room, ſparks of electric light are viſible between the contiguous ſurfaces of the links. Dr. Prieſtley, conſidering this effect as ariſing from the want of perfect contact between the links, endeavoured to render it perfect by ſtretching the chain, until on making the diſcharge no ſuch ſparks ſhould be ſeen. This he accompliſhed by making one end of the chain faſt on a firm body, and appending weights to the other end. Thus proceeding, he found that a very conſiderable weight was neceſſary to be applied, before the ſparks could be made to diſappear between the links, when the jar was diſcharged through the chain. This induced Dr. Prieſtley to conclude, that the links of the chain could not be brought into actual contact without the application of a great force; ſince the electric ſparks are viſible only when the electric fluid in paſſing through a body or a ſeries of contiguous bodies, meets with ſome obſtruction, or interruption of continuity.

Beſides the exiſtence of the above-mentioned reſiſting or repulſive power on the ſurfaces of ſuch groſs bodies as come under the cognizance of our ſenſes; it is farther ſuppoſed, that each component particle of ſuch bodies is indued with the ſame repulſive power; in conſequence of which they are not actually in contact with each other, though they form the ſame firm and impenetrable compound. And the exiſtence of this power has been inferred from the phenomena of contraction and expanſion. "Whatever opinion," ſays Dr. Young, "we may entertain, with reſpect to the ultimate impenetrability of matter in this ſenſe, it is probable that the particles of matter are abſolutely impenetrable to each other. This impenetrability is not however commonly called into effect, in caſes of apparent contact. If the particles of matter conſtituting water, and ſteam, or any other gas, are of the ſame nature, thoſe of the gas cannot be in perfect contact; and when water is contracted by the effect of cold, or when two fluids have their joint bulk diminiſhed by mixture, as in the caſe of alcohol, or ſulphuric acid, and water, the particles cannot have been in abſolute contact before, although they would have reſiſted with great force any attempt to compreſs them. Metals too, of all kinds, which have been melted, become permanently more denſe when they are hammered and laminated."

Whoever wiſhes to form a proper eſtimate of the merits of the above-mentioned arguments, and of the validity of the propoſition which they are intended to eſtabliſh, muſt neceſſarily take into the account all the other properties of matter, which have been diſcovered and confirmed by repeated and univerſal experience; for, ſhould it appear impracticable to reconcile the former with the latter, then ſuch other explanation of the phenomena ought to be ſubſtituted as may be attended with leſs contradiction and greater ſimplicity.—That there is a mutual and univerſal attraction amongſt all the particles of matter, is now no longer to be doubted; that this attraction is extended to all diſtances under certain determinate laws, has been ſufficiently eſtabliſhed by ſtrict mathematical reaſoning upon the grandeſt phenomena of the world; that the ſurfaces of ſeveral bodies, like thoſe of poliſhed glaſs or metallic bodies, when placed contiguous to each other, manifeſt a conſiderable degree of attraction, is well known; and, laſtly, that the component parts of ſolids cannot be ſeparated without a conſiderable force, is ſhewn by daily and common experience. Yet, notwithſtanding all theſe evidences of attraction between the bodies of the univerſe at all diſtances, we are told that a conſiderable repulſive power exiſts on the ſurfaces of bodies, and even that every individual particle of matter is endowed with a ſimilar power; ſo that in the hardeſt bodies, ſuch as a diamond, a flint, a piece of metal, &c. which cannot be divided without an immenſe force, the component particles are not actually in contact with each other. But let us endeavour to explain the phenomena, upon which the above theory is eſtabliſhed, in a ſimpler and more ſatisfactory manner.

In the experiments with the glaſſes, it is ſaid that their actual contact is prevented by a power of repulſion on their ſurfaces, which cannot be overcome without a very extraordinary preſſure. Would it not be more natural to ſuppoſe, that the contact cannot be eaſily effected on account of the inequalities of the ſurfaces, and of the hardneſs of glaſs? The ſurfaces of the glaſſes may be ſaid to be ſlightly convex or perfectly flat, and ſuch they may appear to be for common purpoſes. But if a perſon examines how thoſe ſurfaces are formed and poliſhed; if he conſiders the alterations of figure which are unavoidably occaſioned by the partial dilatations or contractions ariſing from heat and cold, alſo from the interpoſition of the leaſt particle of duſt, or even of the air itſelf; he will be eaſily perſuaded, that thoſe ſurfaces are by no means really flat or uniformly convex in the ſtrict meaning of thoſe words. It is true that the action of thoſe cauſes, *viz.* the inequalities that are produced by them, are exceedingly ſmall; but it is of ſmall effects that we are ſpeaking. Upon the whole, therefore, it ſeems, that when the flat and convex glaſſes in the Newtonian experiment, or the two flat glaſſes, are placed the one upon the other, they do actually touch each other, but in a few points only, *viz.* with their more prominent parts, and that the other more depreſſed parts of their ſurfaces cannot come into actual contact, unleſs the former are depreſſed to the level of the latter, by the application of an external force; ſo that the application of this force is not required by the exiſtence of a repulſive power, but by the neceſſity of depreſſing the more elevated parts, in order that the lower or hollow parts may come ſufficiently near to each other. This idea ſeems to derive additional confirmation from the degree of preſſure which muſt be applied, &c. being, at leaſt apparently, proportional to the hardneſs of the bodies employed. Thus, in glaſs, which has a great degree of hardneſs and rigidity, a conſiderable preſſure muſt be applied for the purpoſe. Bring two pieces of cold wax cloſe to each other, and the one will puſh the other forward without adhering to it, becauſe in that cold ſtate the contact can take place in a very few points only; but if thoſe pieces of wax be ſoftened by heat, it will be found, that one of them cannot be cauſed to puſh the other without adhering to it, becauſe in that ſoft ſtate their ſurfaces are eaſily adapted to each other, and inſtantly increaſe the number of points of contact.

The appearance of ſparks between the links of a metallic chain, when an electric jar is diſcharged through it, may be explained in a ſimilar manner, without having recourſe to a power of repulſion, &c. for, in conſequence of their figure, and of the inequalities of ſurface, the links cannot touch each other in more than a very few points, through which the electric fluid muſt paſs; and though in thoſe points the contact be perfect, yet the electric fluid either melts them or renders them red-hot, and of courſe affords the appearance of luminous ſparks, in the ſame manner, and for the ſame reaſon, which renders a very fine metallic wire red-hot, or fuſes it, when an electric jar is diſcharged through it; namely, becauſe it is not large enough to afford a free paſſage to the electric fluid. So that if in the ſlender wire, where there is no interruption of continuity, the paſſage of the electric power is rendered manifeſt to our eyes, it may be evidently preſumed that the ſparks may appear between the links of the chain, though thoſe links may be in actual contact. That the light diſappears when, by ſtretching the chain, the points of contact are multiplied, needs no farther explanation. But the circumſtance which contributes to the production of the ſparks, is the adheſion of dirt or duſt, or the partial oxydation of the ſurface of the links; conſidering that chains for electrical purpoſes are generally made of braſs or iron, which are very liable to a ſuperficial oxydation.

With reſpect to the laſt argument, derived from the contraction and dilatation of bodies, we may obſerve, with profeſſor Prevoſt, that the diminution of bulk does by no means prove that the component particles of bodies are not in immediate contact; for a perſon may eaſily conceive an infinite variety of arrangements or diſpoſitions of the elementary particles, which will admit of contraction and dilatation, without the leaſt interruption of contact. Thoſe particles, for inſtance, may be diſpoſed in the form of rings, which, by becoming more extended ovals, or more circular, will occaſion an enlargement, or a contraction of the aggregate. The particles may be ſuppoſed to be arranged in rows, and theſe rows may be diſpoſed at certain angles with each other; ſo that the bulk of the aggregate may become expanded or contracted according as thoſe angles are enlarged or diminiſhed; and ſo forth. That ſome ſuch arrangement is not only probable, but does actually take place in moſt bodies (whence it may be inferred to take place in all bodies) is clearly indicated by the cryſtallization of ſeveral bodies; *viz.* a regular arrangement of their particles; as in zinc, biſmuth, frozen water, ſalts, &c.

CONTACT, *angle of*, is the angle HLM (*Plate* III. *Geometry*, *fig.* 51.) formed by the arc of a circle ML, with the tangent HL, at the point of the contact.

Euclid demonſtrates, that the right line HL, ſtanding perpendicular on the radius CL, touches the circle only in one point: nor can there be any other right line drawn between the tangent and the circle.

Hence, the angle of contact is leſs than any rectilinear one; and the angle of the ſemicircle between the radius CL, and the arc ML, is greater than any rectilinear acute angle.

This ſeeming paradox of Euclid has exerciſed the wits of mathematicians: it was the ſubject of a long controverſy between Peletarius and Clavius; the firſt of whom maintained the angle of contact heterogeneous to a rectilinear one; as a line is heterogeneous to a ſurface: the latter maintained the contrary.

Dr. Wallis has a formal treatiſe on the angle of contact, and of the ſemicircle; where with other great mathematicians, he approves of the opinion of Peletarius. See ANGLE *of Contact*.

CONTAGION, frequently uſed as ſynonymous with *infection*, the matter or medium by which certain diſeaſes are communicated from one individual to another.

Some writers confine the term *contagion*, in conſequence of its derivation from *con* and *tango*, *I touch*, to the communication of thoſe diſeaſes, which can only be transferred by actual contact of the ſick, or of the palpable matter from their bodies; and apply the word *infection* to the communication of thoſe other diſeaſes, which ſpread by means of inviſible effluvia, conveyed through the air, or adhering to articles of clothes, &c., conſtituting what are called *fomites*. The diſtinction is not important, nor is it philoſophically accurate; ſince there is an actual contact of a morbid matter, in all caſes of infection, whether viſible or not; and ſome diſeaſes, as the ſmall pox, are communicated both by palpable matter, and by imperceptible effluvia. Other writers have confined the two terms to more arbitrary ſignifications. We are diſpoſed with Dr. Wilſon and others, to conſider the word contagion as expreſſing the morbid poiſon, or the means of transferring a diſeaſe; and infection, as expreſſing the operation of the poiſon, or the act of communication of the diſeaſe. Treatiſe on Febrile Diſeaſes, vol. i. p. 433.

No mention is made of contagion in the writings of Hippocrates, and it is hence maintained by ſome authors, that the ancients were altogether ignorant of its exiſtence. It cannot be doubted, indeed, that many of the moſt formidable diſeaſes, which are propagated by contagion, in modern times, were altogether unknown to the ancients: ſuch are the ſmall-pox, meaſles, and ſcarlet fever, among the acute; and the venereal diſeaſe, among the chronic contagions. Of the exiſtence of contagion, therefore, the evidence which they poſſeſſed was comparatively ſmall. From the number of the laws in the Moſaic code, however, forbidding all communication with perſons labouring under diſeaſes, which were deemed unclean, and from the caution with which intercourſe with foreign nations was precluded, it would appear that a general notion of that ſpecies of contagion, which infects by actual contact of bodies, prevailed among the Jewiſh people, at a very early period. (See Numbers, chap. xxxi.) And whatever might be the knowledge of profane writers on this point, they were certainly well acquainted with epidemic diſeaſes. But this does not imply a knowledge of the exiſtence of contagion, ſince even with the moſt confirmed proofs of the exiſtence of febrile contagions before them, phyſicians have generally diſputed, in the worſt modern epidemics, whether contagion actually exiſted or not. Livy, however, in deſcribing the progreſs of an endemic fever, expreſsly mentions that contact of the ſick excited the diſeaſe. "Et primo temporis ac loci vitio, et ægri erant, et moriebantur; poſtea curatio ipſa et contactus ægrorum vulgabat morbos." Lib. xxv. cap. 26. But, although it be admitted that the exiſtence of contagion was occaſionally noticed by ancient writers, and was by more modern authors yet more generally known, its nature and mode of propagation were very imperfectly underſtood, until the latter half of the eighteenth century; when the method of induction was applied to the inveſtigation by ſome medical philoſophers, and more particularly by Dr. Haygarth.

Of that ſpecies of contagion by which certain chronic diſeaſes are propagated by actual contact, little need be ſaid. Its exiſtence is obvious in a palpable ſecretion from the morbid part, and therefore the prevention of it, by avoiding contact with the diſeaſed, is clear and eaſy. The diſeaſes in which ſuch contagious matter is produced, are the venereal diſeaſe, the itch, the tinea capitis, or ſcald head, the yaws, ſivvens, &c. The hydrophobia would be incorrectly claſſed with theſe diſeaſes, although it agrees with them in being propagated by contact of a poiſonous ſecretion.

In ſome acute diſeaſes, which may be conſidered as an intermediate claſs, being propagated both by contact and effluvia, there is not leſs evidence of the exiſtence of contagion, as in the ſmall-pox, chicken-pox, and meaſles; becauſe by the conveyance of a portion of the fluid contained in the puſtules of the former, and in the miliary veſicles of the laſt, (See Willan on Cutaneous Diſ. p. 219.) the ſame train of ſymptoms has been excited in the perſons receiving it, as occurred in the perſons by whom the contagious matter was produced. But theſe diſeaſes have been ſtill more frequently obſerved to attack perſons, who have approached within a ſhort diſtance of the ſick, where no contact took place; implying that the contagious matter, in an imperceptible form, was conveyed through the air, from the one body to the other.

The origin of the contagions, which produce theſe two claſſes of diſeaſe, is a ſubject of conſiderable difficulty; and inquiries in regard to it have generally proved fruitleſs, or led the inquirer into abſurdities. By what concurrence of circumſtances, or by what particular idioſyncraſy in any individual, a new animal poiſon can be generated, which ſhall excite a new and formidable diſeaſe, and propagate itſelf, and ſpread fatality for centuries through the world, we are altogether unable to diſcover. Yet in the hiſtory of medicine we find new and unknown contagious diſeaſes ſpringing up, and old ones, which had long prevailed, ſuddenly diſappearing. The ſmall-pox, and the meaſles, were firſt deſcribed by the Arabian phyſicians, and the ſcarlet fever firſt ſhewed itſelf in Italy in the fifth century. (See Willan on Cutaneous Diſ. Order iii. p. 289.) The venereal diſeaſe was alike unknown to the ancients. The Plica Polonica ſeems to have made its appearence only in the laſt century. And on the other hand the leproſy of the Jews, and other ſpecies of leproſy, which raged in Europe in the 12th and 13th centuries, are ſcarcely now to be met with: and we have a remarkable inſtance both of the production and diſappearence of a contagious diſeaſe in the Ephemera Britannica, Sudor Anglicus, or ſweating ſickneſs, as it was termed, deſcribed by Caius and others. In ſuch inſtances, if it ſhould happen at any time that no perſon labours under the diſeaſe, the contagion might be loſt, and the diſeaſe for ever diſappear, unleſs the cauſes, which firſt gave riſe to it, ſhould again concur to reproduce it.

The caſe is altogether different in reſpect to moſt of the fevers of that claſs, which are propagated by effluvia only, and in which no palpable poiſon is generated. Such is the typhus, or fever with debility, which prevails, under different denominations, in the temperate climates. According to the circumſtances of its origin, it has been termed jail-fever, camp, hoſpital, and ſhip-fever: and from the variety of its appearances, putrid, malignant, petechial fever, &c. and it is occaſionally combined with other diſeaſes, along with which it is propagated, as with inflammation of the lungs, conſtituting the peripneumonia typhodes of authors, and with a dyſenteric affection of the bowels, as in the camp-dyſentery. In theſe inſtances the origin of the contagion has been obviouſly traced to circumſtances of common occurrence; hence peſtilential fevers of this claſs frequently ariſe ſpontaneouſly, that is, independently of the propagation of an exiſting poiſon, which has been perpetuated either by fomites or infected perſons from its firſt origin. It is probable that the plague itſelf belongs to this claſs, and is the common fever, rendered peculiarly malignant by climate, ſeaſon, or other circumſtances.

The contagion, by which theſe fevers are propagated, is generated in three ways;—by the confinement of the healthy animal exhalations or effluvia in a crowded, and ill ventilated place;—ſtill more readily by the confinement of morbid effluvia, although the diſeaſe be not originally contagious; and 3dly, by the exhalations from putrifying dead animal matter.

1. Many facts have been recorded, which ſhew that the natural effluvia of the living body, become the ſource of contagious fevers, when accumulated and concentrated in cloſe apartments. Mr. Howel and others, who eſcaped from the black hole of Calcutta, were ſeized with typhus fever. Dr. Lind informs us, that in a frigate, which ſailed from North America, with a healthy crew, a malignant fever broke out before her arrival in England, during very bad weather, which affected a conſiderable number of the men, and of which the ſurgeon's mate, boatſwain, and ſome others died. "Thus," he remarks, "a ſeaſoned ſound crew became infected, as it would appear, from the cloſeneſs or damp below, occaſioned by the hatchway being kept ſhut." (On Fevers and Infections, chap. i. § 2.) Sir John Pringle has obſerved that the hoſpitals of an army, not only when crowded with ſick, but at any time when the air is confined, and eſpecially in hot weather, produce a fever of a particular kind, and often mortal. "I have obſerved the ſame ſort to ariſe," he adds, "in full and crowded barracks, and in tranſport-ſhips when filled beyond a due number, and detained long by contrary winds; or when the men have been long kept at ſea under cloſe hatches in ſtormy weather. Hoſpital-ſhips, for diſtant expeditions, have for this reaſon been generally deſtructive both to the ſick and their attendants. (Obſ. on the Diſ. of the Army, part iii. chap. 7.) But contagious fevers are much more readily produced, under circumſtances of confinement, where uncleanlineſs alſo conſpired: hence ſuch fevers originate moſt frequently among the poor, and even the moſt ſevere peſtilence, when not imported, is generally to be traced to ſome quarter chiefly inhabited by the poor.

2. Where people, labouring under any diſeaſes, are crowded together, more eſpecially if the apartments are imperfectly ventilated, contagion is readily generated. Sir John Pringle remarks, that contagious fever "is incidental to every place, ill aired and kept dirty, that is filled with animal ſteams from foul and diſeaſed bodies; and on this account, jails and military hoſpitals are moſt expoſed to this kind of peſtilential infection; as the firſt are in a conſtant ſtate of impurity, and the latter are ſo much filled with the poiſonous effluvia of ſores, mortifications, dyſenteric and other putrid excrements: nay, there is reaſon to apprehend that when a ſingle perſon is taken ill of any putrid diſeaſe, ſuch as the ſmall-pox, dyſentery, or the like, and lies in a ſmall cloſe apartment, he may fall into this malignant fever." Loc. Citat. It is very common, indeed, to obſerve mild febrile attacks among the poor, which, though originating from cold or other cauſes, become contagious in their courſe, in conſequence of the confined and dirty ſituations in which the patients lie.

3. Contagion occaſionally originates from the putrifying effluvia of animal and vegetable matters. Thus it often happens that typhus fever ſpreads itſelf over the adjacent country, when the dead are left unburied on the field of battle. Foreſtus mentions a contagious fever, which raged at Egmont, in North Holland, occaſioned by the putrefaction of a whale, which had been left on the ſhore. And Senac gives an account of a malignant fever, excited by the offal of a city being accumulated without the walls. It was

received into a ditch filled with water, and, while it was covered with the water, was not attended with any bad conſequence; but when the quantity increaſed, ſo that it roſe above the ſurface, a dreadful fever ſpread through the city, and its neighbourhood; ſo that, where four hundred uſed to die yearly, the deaths were increaſed to two thouſand. Wilſon on Febrile Diſeaſes, loc. cit.

The moſt important part of our inquiry reſpecting contagion, relates to the mode and circumſtances of its communication from individual to individual, and of its general ſpreading, with a view to diſcover the means of ſuppreſſing it, or preventing its extenſion. This inquiry is, of courſe, limited to the contagions which are ſoluble or diffuſible in atmoſpheric air; ſince it is obvious that the indiffuſible contagions may be avoided, by ſhunning the contact of the diſeaſed. And it muſt be premiſed, that all the febrile contagions, whether of a ſpecific origin, as that of ſmall-pox, meaſles, ſcarlet fever, or malignant ſore throat, or ariſing from the caſual change of the animal effluvia, as that of typhus, jail and hoſpital fever, and perhaps the plague, have been found, by experiments, to be propagated according to the ſame laws, and to be ſuppreſſed by ſimilar means.

Whenever a contagious epidemic diſeaſe prevails, a great general alarm is excited, in conſequence of a notion, that the ſeeds of an evil ſo generally deſtructive muſt be diffuſed through the atmoſphere at large; and that, if we ſtir abroad, we breathe contagion at every ſtep. This opinion has been promulgated by phyſicians of high rank and authority; but recent obſervations have ſhewn that it is erroneous: thus at once removing all grounds for this unneceſſary alarm, and directing our attention to thoſe means of precaution and prevention, which can alone effectually contribute to our ſecurity. Dr. Lind long ago affirmed, after an extenſive experience in the great naval hoſpital at Haſlar, that the infection of malignant fever, in common with that of the plague, "extends to no great diſtance from its ſource."—"In the open free air, this infection does not appear to diffuſe itſelf above fifty or ſixty feet from its *nidus.*" Chap. iv. ſect. 2. With reſpect to the plague, it has been well aſcertained by phyſicians, that its contagion does not contaminate the atmoſphere in general, nor indeed to any great diſtance from the ſource of the poiſon. Dr. Patrick Ruſſell, who was in extenſive practice at Aleppo for many years, particularly during the plague of 1760, 1761, and 1762, uſed to adminiſter medicines to great numbers ill of the plague, every day, out of a ſtreet window, about 15 feet above the ground, even in June and July; and, being ſhort-ſighted, he examined the ſores within four feet: yet neither his family, nor any inhabitant of the ſquare where he lived, were infected by the contagion of ſuch a number of peſtilential patients: and he affirms that it never ſpread in a large houſe, if communication were prevented. A numerous body of Franks live in Conſtantinople, and are uniformly preſerved from the plague, by obſerving a few rules of cleanlineſs and *ſeparation,* while the Turks die of it in multitudes around them. De Mærtens, author of a hiſtory of the plague at Moſcow, anno 1771, has ſhewn that the contagion was diſſeminated to a very ſhort diſtance through the air: a fact, which was demonſtrated by the ſucceſsful conduct of the committee of phyſicians, appointed by the empreſs to attend the ſick on that occaſion. The juſt inference from theſe obſervations is, that the plague is principally propagated by actual contact or cloſe communication with the diſeaſed, or their clothes, furniture, &c. "Solo ægrorum et rerum infectarum, contactu communicabatur," ſays Dr. De Mærtens, "atque atmoſphæra contagium non ſpargebat; ſed ſaniſſima ſemper fuit. Viſitando tam prope adſtabamus illis, ut ſola pedis diſtantia inter nos et eos ſæpe vix remaneret, et abſque alia quacunque cautela, quàm quod nec corpus neque veſtes aut lectum tangeremus, a peſte immunes permanſerimus. Linguam propius obſervando ſolebam linteum aceto communi imbutum naribus et ori admovere." Hiſt. Peſt. Moſcueus.

In addition to ſuch facts, which are ſtated by phyſicians of high reſpectability, we have the ſupport of direct experiments, made reſpecting a contagion not leſs virulent and fatal than the plague itſelf, *viz.* that of the ſmall-pox; by which the ſhort diſtance, to which the poiſon is communicated through the air, is demonſtrably proved.

Dr. O'Ryan, profeſſor of phyſic in the college at Lyons, inſtituted the following experiments, which we ſhall relate in the words of Dr. Haygarth's tranſlation: "I placed a large doſſil of cotton, ſoaked in variolous matter, on the middle of an oval table, whoſe leaſt diameter was three feet. I ſeated ſix children around it, three on each ſide of the table, in ſuch a manner that all were ſituated within half a yard of the infectious cotton. This experiment was ſometimes made in the open air, ſometimes in the houſe. I took care to renew, every ſecond day, both the variolous matter, and the ſubſtance which contained it. I alternately uſed the poiſon taken from the inoculated and from the caſual ſmall-pox; and I copiouſly impregnated with it balls of cotton, wool, and ſilk. This operation, repeated during a whole week, morning, noon, and night, for an hour at each ſitting, produced no effect.

"I then ſent away the children, deſiring the parents to acquaint me, in caſe any indiſpoſition appeared, and to bring them to me a fortnight afterwards, although no alteration ſhould have taken place in their health. I declare that not only for that term, but for many ſucceeding months, during which I took care frequently to viſit them, they all enjoyed perfect health. It was not till nine months after this time, that four of theſe children had a mild kind of ſmall-pox.

"Having concluded from theſe experiments, that the children could not have eſcaped infection; but becauſe the variolous matter might have loſt that ſpring and that degree of energy, which perhaps it may poſſeſs on ariſing immediately from the human body, I placed a perſon, in the eruptive fever of the ſmall-pox by inoculation, at the diſtance of about half a yard from four children properly prepared: each expoſure continued one hour, and was repeated daily for a fortnight, reckoning from the commencement of the fever till the puſtules were become perfectly dry. Not one of the four received the infection. Two months afterwards, I inoculated three of theſe children: they had the diſtemper in a very mild manner, and recovered without difficulty." Diſſ. ſur les Fievres Infectieuſes et Contagieuſes. See Dr. Haygarth's Sketch of a Plan to exterminate Small Pox, vol. i. p. 79.

Again, proofs that the ſphere of activity of febrile contagion is extremely limited in the air, have been greatly multiplied ſince the inſtitution of fever-wards and houſes of recovery, which were ſuggeſted by Dr. Haygarth, from the contemplation of ſuch facts as we have juſt detailed. The fever-wards, in the Cheſter Infirmary, are ſituated within thirteen yards of ſome other wards of the building; yet, during a ſpace of above twelve years, the contagion of fever was never known to extend itſelf from thence. And Dr. Currie relates, in a letter to Dr. Clark of Newcaſtle, that contagious fever had not, during ten years, extended itſelf, in any one inſtance, from the fever-wards, either in the Liverpool Infirmary or in the workhouſe, although the latter of theſe buildings has ſometimes contained 1,400 perſons.

In like manner, the houſe of recovery, in Gray's Inn Lane, London, which ſtands in a row, in contact with dwelling houſes on both ſides, and which has had a conſtant ſucceſſion of contagious fevers in its wards, has now (Dec. 1807) been open nearly ſix years, and no fever has occurred in its neighbourhood during the whole period. Nay, it has been farther aſcertained, in theſe wards and houſes, as well as in the habitations of the rich, that, in a clean well-aired room of a moderate ſize, the contagious poiſon is ſo completely diſarmed of its virulence, by dilution with freſh air, as rarely to excite the diſtemper, even in nurſes, expoſed to all the putrid miaſms of the breath, perſpiration, and other diſcharges. See Dr. Haygarth's Letter to Dr. Percival, on the Prevention of Infectious Fevers, 1801. Dr. Clark's Collection of Papers reſpecting Fever-wards, Newcaſtle, 1802. Reports of the Inſtitutions for the Suppreſſion of Contagious Fever, in Dublin, London, Mancheſter, &c.

A ſufficient number of facts, we truſt, has been cited, to ſhew that the popular opinion and apprehenſion are groundleſs, and that the moſt malignant contagions are never conveyed to any great diſtance through the atmoſphere; but that they are, in fact, rendered inert and harmleſs, by diffuſion in the open air, and even in the air of a well ventilated apartment. The neceſſary inference is, that all peſtilence is propagated by *near approach* to, or *actual contact* of, the diſeaſed, or by the *conveyance of the contagious poiſon in articles impregnated with it*.

Dr. Lind remarks, in the eſſay before quoted, "by a fixed attention to this ſubject for ſome years paſt, I am convinced, that the *body* of the diſeaſed, kept exactly neat and clean, is not ſo liable to impreſs the *taint*, as his late wearing apparel, dirty linen, and uncleanlineſs of any ſort about him, long retained in that impure ſtate:—I ſay, theſe laſt contain a more certain, a more concentrated, and contagious poiſon, than the newly emitted *effluvia* or excretions from the ſick." There is no doubt that ſuch *fomites* ſpread and perpetuate many contagious diſeaſes among us. It is aſcertained that cotton, hair, and wool, are the ſubſtances moſt readily imbued with contagion, which becomes more virulent, when the air is prevented from having free acceſs to them. If infected clothing, made of theſe materials, remain for ſome weeks in a full cloſe room, or locked up in cheſts, and be then ſold out during an unhealthy ſeaſon, not only the wearers of it, but all who have intercourſe with them, are preſently affected, and contribute to ſpread the diſeaſe. Thus the Europeans, ſays Dr. Lind, have carried the ſmall-pox to almoſt all parts of the world, where their ſhips have opened a trade; though the ſeamen in thoſe ſhips might not have been afflicted with it in their voyage. This poiſon has been conveyed, in an old blanket, to nations of Indians, ſome of whom it has almoſt extirpated. In the year 1746, while the French ſquadron, under the command of the duc D'Anville, paſſed the ſummer at Chebucto, now Halifax, an infectious fever prevailed among them, and cut off a great number of their men. On the return of the ſquadron to Europe, ſeveral blankets and old clothes, which had been uſed in their tents and hoſpitals, were unfortunately left behind. Theſe fatal receptacles of diſeaſe were ſoon after eagerly picked up by a party of Mimack Indians, who accidentally came to viſit the place, and who clothed themſelves with ſome of them; others they carried home, and diſtributed among their tribe. The unhappy conſequence of which was the almoſt total extinction of the Mimack nation; ſcarce any of them ſurvived. The Engliſh, upon traverſing the country next ſummer from Annapolis Royal, were ſurpriſed with finding the dead bodies and ſkeletons of whole families lying unburied in their huts, until the neutrals, who alſo inhabited that country, and the neighbouring Indians informed them, that the Mimacks had been cut off by the French blankets. In ſeveral of their huts, theſe blankets were found, where not one of the family remained. (Lind. chap. iv. ſect. 2.)

Dr. Willan remarks, on the ſubject of fomites, that the houſes of the poor in London are often ſo little taken care of, that in the apartments where contagious fevers have exiſted, enough of the contagion remains, to infect all the inmates who ſucceſſively occupy the ſame premiſes; and he mentions ſome particular houſes, in which the fomites of fever were thus preſerved for a ſeries of years. (Reports on Diſ. of London, p. 256.) The ſame accurate obſerver ſtates, that the ſcarlet fever, which, when epidemic, has often commenced in the eaſtern extremity of London, and ſpread weſtward, though it may have been ſometimes imported with infected goods brought from abroad, will be more frequently found to have originated from the large repoſitories of old clothes, near the Tower, Eaſt Smithfield, and Ratcliffe Highway. "During the laſt year of my attendance at the Public Diſpenſary," Dr. Willan adds, "I had reaſon to think that a family in Wild-ſtreet, Lincoln's-inn-fields, was infected with ſcarlatina maligna by clothes bought in Monmouth-ſtreet. More than fifty perſons in the adjoining houſes were ſoon affected with the diſeaſe, which afterwards traverſed Drury-lane, and ſpread by Long Acre, and the ſtreets connected with it, through ſeveral pariſhes in Weſtminſter." (On Cutan. Diſeaſes, p. 391.) Thus alſo, and not by the impregnation of the atmoſphere, the ſmall-pox, meaſles, typhus, whooping-cough, itch, tinea capitis, &c. are perpetuated among us; and the febrile contagions are from time to time widely diffuſed.

A great number of facts are on record, which ſerve to ſhew the extreme virulency of contagious poiſons, which have been pent up and accumulated in cloſe places, and have contaminated articles of clothing under ſuch circumſtances. In thoſe periods of our hiſtory, when a leſs enlightened humanity was careleſs of the health of criminals, and priſoners in general, the occurrence of what were called *black aſſizes* was frequent in different parts of the country. The criminals, brought out of filthy and infected cells, with their clothes fully imbued with *fomites*, often ſpread a mortal contagion through the court, aſſembled for the purpoſes of juſtice. "The moſt pernicious infection next to the plague," ſays lord Bacon, "is the ſmell of the jail, where the priſoners have been long, and cloſe, and naſtily kept, whereof we had in our time experience, twice or thrice, when both the judges, who ſat upon the jail, and numbers of thoſe who attended the buſineſs, ſickened upon it and died." One of the inſtances, to which lord Bacon alludes, was doubtleſs at the fatal aſſizes, held at Oxford, in the year 1577; of which Stow gives the following account in his Chronicle. "On the 4th, 5th, and 6th days of July, were the aſſizes held at Oxon, where was arrainged and condemned Rowland Jenkins for a ſeditious tongue; at which time, there aroſe amidſt the people ſuch a damp," (an expreſſion in the language of thoſe days, ſignifying bad air) "that almoſt all were ſmothered, very few eſcaped that were not taken, here died in Oxon 300 perſons, and ſickened there, but died in other places, 200 and odd." Similar infections took place at the black aſſizes at Taunton, and alſo at thoſe of Exeter, in 1586; at which laſt ſome Portugueſe ſailors ſpread the contagion, having been confined, without change of clothes, "in a deep pit and ſtinking dungeon." The laſt black aſſizes at the Old Bailey were held ſo late as the year 1750. On the 11th of May the priſoners, who were brought into court, ſome of them labouring under jail-fever, had been kept nearly a whole day in ſmall, cloſe, and crowded apartments. All the individuals, who were ſeated in the courſe of a draught of air, paſſing from the priſoners to an open window, were ſeized with the diſtemper: the reſt eſcaped. The lord mayor and thoſe of the bench who ſat on his left hand were infected; while the lord chief juſtice, and the recorder, who ſat on his right, eſcaped. Many of the Middleſex jury, on the left ſide of the court, died of it, while the London jury, who ſat oppoſite to them, received no injury. On the 13th of May died alderman Lambert; on the 14th R. Cox, under-ſheriff; on the 17th baron Clark; on the 19th ſir T. Abney, juſtice of Common Pleas; T. Otway, barriſter; W. Baird, ditto; W. Sharplop, and four others; on the 20th, the mayor and eight of the Middleſex jury. See Gentleman's Magazine.

Theſe facts, while they evince the active virulence of contagion, accumulated in fomites in unventilated and crowded rooms, afford, at the ſame time, evidence, that, except where it is carried at once by a direct draught of air, its tendency to diffuſe itſelf, and its power when diffuſed, through the atmoſphere in general, is very limited. It is only under ſuch circumſtances of concentration, that the virulence of contagion is ever ſo great, as to be infectious at more than a few feet diſtance. It has already been ſhewn, that when ariſing from the *body* of the ſick, either in the open air, or in well ventilated rooms, its influence is confined to a very ſmall diſtance.

Before we point out the means of prevention from contagious diſeaſes, which theſe facts and obſervations ſuggeſt, it will be neceſſary to attend more particularly to the circumſtances of individual infection.

All individuals are not equally liable to be infected by contagion; and ſome, though the number is extremely ſmall, eſcape altogether. Thus, there are perſons who have gone through a long life without taking the ſmall-pox. The conſtitution, however, appears occaſionally to undergo ſuch a change, in the courſe of life, that thoſe who, in earlier years, had reſiſted the action of this contagion, have received it on ſome future expoſure to its influence. There is a conſiderable difference, too, in the infectious degree of different contagions: thus, that of the whooping-cough affects a much ſmaller proportion of mankind, than that of the meaſles, or ſmall-pox; and that of the ſcarlet fever excites the diſeaſe in children much more frequently than in adult perſons. Again, the contagion, in ſome inſtances of peſtilence, and, we believe, in the plague in general, is more fatal to the vigorous and middle-aged, than to the old on the one hand, or to children on the other. We were informed by a gentleman, who reſided at Malaga, during the late peſtilence at that place, that the appearance of the town, after the ceſſation of the fever, was remarkable, in conſequence of the ſmall number of ſtrong, active, and well-looking people, who were to be ſeen; old people and children conſtituting almoſt the whole of the remaining population. In the typhus, or contagious malignant fever of this country, Dr. Haygarth infers, from accurate deduction, that about eight in 188 eſcape infection, though fully expoſed to the contagion; which is leſs than *one* in *twenty-three*. (See Letter to Dr. Percival, p. 31.) It has been calculated that nearly the ſame number, or one in 20, is naturally exempted from the contagion of the ſmall-pox. Upon this datum it was alſo calculated, that if two perſons together have eſcaped the diſeaſe, the probability, that they were never both expoſed to an *infectious quantity* of the poiſon, is above 400 to one; if three in a family have eſcaped, above 8000 to one. (Haygarth's Inquiry how to prevent the Small-pox, p. 24.) This mode of reaſoning is equally applicable to typhous infection.

Now, as great numbers of people, viſitors, nurſes, &c. breathe the air of the chambers of patients, ill of contagious fever, and yet eſcape infection, it is obvious that in almoſt all theſe caſes, (at leaſt in 22 out of 23) a ſufficient *doſe* of the poiſon had not been received. This leads us to an important inquiry, into the doſe of typhous contagion requiſite to produce infection. The quantity will vary, no doubt, according to different circumſtances, but the obſervations of Dr. Haygarth, and of the phyſicians of fever-wards, and houſes of recovery, have enabled us to judge with ſome accuracy of the limits of this variation. There appears to be a ſtrict analogy between contagious miaſms and other poiſons. The larger the doſe of a poiſon or drug, the greater in general is the effect which it produces. Many of the moſt powerful and ſalutary medicines, when taken in too large a quantity, are poiſons, as opium, antimony, mercury, foxglove, hemlock, &c. And, on the other hand, even arſenic itſelf, the moſt virulent and unmanageable of all poiſons, has, by the ſkill and attention of phyſicians, been reclaimed from the claſs of miſchievous ſubſtances, and by a diminution of the doſe is juſtly held to be a ſafe and uſeful remedy. Farther, in different conſtitutions, and in different maladies, there is a certain degree of variety in the operation of any drug. Thus four or ſix times the doſe, *e. g.* of antimony or mercury, may be required for one patient more than for another, or for the ſame perſon in different diſeaſes. In the ſame way the miſchievous quantity of infectious miaſms admits of ſome variation.

It is clear, from the collected obſervations of Dr. Haygarth, and of thoſe active and experienced phyſicians whoſe correſpondence he has publiſhed, not to mention the experience which fever-wards have lately afforded, that in a large, airy, and clean apartment, few or none even of the moſt intimate attendants catch the diſeaſe, where the patient labours under infectious fever. The nurſes themſelves, expoſed to the effluvia of the excrements, and perpetually near, and often in contact with the ſick, nevertheleſs hardly ever receive infection. The atmoſphere of a room where contagion is generated, if cleanlineſs and ventilation are employed, may therefore be breathed for a long time with impunity. And it is not leſs clear, that an atmoſphere ſtrongly impregnated with contagion, may be breathed, for a ſhort time, with the ſame impunity. If we compare the numbers who eſcape infection after being expoſed to breathe a contagious atmoſphere, with the ſmall number who are naturally not ſubject to receive contagion, this propoſition muſt be obvious. But to ſtate facts. "During four years attendance in the hoſpitals of Edinburgh and London, and afterwards during thirty-one years in private practice in Cheſter, and fourteen years and a half in the Cheſter Infirmary, and three years at Bath, I have been," ſays Dr. Haygarth, "in the habit of breathing air ſtrongly impregnated with the infectious miaſms of fever. In many, very many, inſtances, I have viſited patients ill of infectious fevers, in ſmall, cloſe, and dirty rooms: yet never but once, above thirty years ago, had a fever. The phyſicians of the Mancheſter Infirmary for many years, and particularly during the late widely-ſpreading epidemics in that large and populous town, have, with great fortitude and humanity, conſtantly viſited the home patients; that is, they have, in innumerable inſtances, breathed the moſt peſtilential air, in the moſt concentrated ſtate. Their and my ſafety manifeſtly proceeded from this circumſtance; we remained but a ſhort time in the patients' room. We did not reſpire an infectious doſe of the poiſon." (Let. to Dr. Percival, p. 40.) We could multiply evidence upon this point to an indefinite extent, but the general ſafety of medical men under ſuch circumſtances is ſufficient to prove, that air ſtrongly impregnated with infectious miaſms may be breathed for a ſhort time, and air weakly impregnated for a long time, without any injury. We might hence be almoſt led to believe, that the poiſonous miaſms do not generate a fever, till they have been reſpired without interruption, for ſeveral days together: and it is not improbable that, in ſome perſons, ſuch an accumulated quantity of the poiſon may be required.

There are, however, other facts which prove that this is by no means always the caſe. Infection is occaſioned ſuddenly, in ſome inſtances, and from a very ſhort expoſure to a peſtilential air. Whether this is owing to peculiar ſuſceptibility of the individual, or to the particular mode of receiving the contagious effluvia, is doubtful. The writer of this article, about ſix years ago, viſited a poor family, of four perſons, lying in the ſame bed, in an exceedingly cloſe and dirty apartment, ill of contagious fever. He always had the precaution to throw open the window on entering the room, to ſtation himſelf between the window and the bed, whilſt he examined the ſick, and to remain but a ſhort time with them. He had repeated his daily viſits during a week, and with impunity, when he was at length accompanied by another phyſician, who deſigned to admit the patients into the Houſe of Recovery, juſt then opened in Gray's-inn-lane. The latter took no precaution, but examined the ſkin of the ſick minutely and cloſely, ſtanding on that ſide of the bed towards which the air from the window impelled the contagious effluvia, and ſo near as to receive theſe effluvia and the breath in the moſt concentrated ſtate. He took the infection, and his fever proved fatal. Here the infection of this excellent phyſician was attributable only to the full doſe of the poiſon, which his incautious zeal induced him to inhale. In moſt caſes, as in this, where a ſudden infection takes place, a diſagreeable ſenſation is excited at the moment of expoſure, which different perſons have deſcribed differently. Some have felt a ſharp taſte in the mouth, as if blue vitriol were diſſolving in it, but which no waſhing or gargling could remove. Others have compared the firſt impreſſion to that of an earthy exhalation from a newly-opened grave, the ſenſation extending down to the ſtomach, ſometimes exciting inſtantaneous ſickneſs and ſhivering. Dr. Haygarth mentions that two of his patients, who were phyſicians, were infected ſuddenly by a ſhort expoſure. One of them thought that he caught the fever by creeping behind, in order to aſſiſt, his patient; the other by inſpecting morbid fæces. In both theſe caſes, the expoſure was ſuch as might probably afford a full doſe of the contagion. Dr. Lind is of opinion, that, in theſe diſeaſes, the ſtools, eſpecially if very fœtid, are moſt communicative of contagion; next to theſe the breath; and laſtly the effluvia from the body.

The activity of contagion is not always proportionate to the appearances of malignancy in the diſeaſed. Sometimes only one man in a ſhip may be ſeized with the *petechial* or with the *yellow* fever, ſays Dr. Lind, while all the reſt continue unaffected. And the moſt malignant caſe of fever, that we ever witneſſed, did not infect any of the family, though in a cloſe and ſmall houſe. And on the contrary, we have ſeen fevers, of the mildeſt deſcription, which ſpread extenſively: ſo that we fully coincide with Dr. Lind in his obſervation, that "fevers have often no peculiar characteriſtic ſymptom, by which they are known to be infectious:" and again, when he ſays, "in ſome this fever will be more ſevere, in others more mild, and often moſt of the ſick will be able to ſit up through great part of the day, which cannot be urged as an argument againſt the infection, but only as a proof of its mildneſs." (Loc. cit. § v.) It is obvious, therefore, that great caution ſhould be uſed in pronouncing fevers *not* infectious.

The period at which different fevers begin and ceaſe to generate contagious effluvia is not abſolutely aſcertained. It ſeems moſt probable that in eruptive fevers there is no contagion till the eruption appears; and that contagion remains ſo long as any ſcab remains on the ſkin. This is clearly the caſe in ſmall-pox.

The latent period of contagion, as Dr. Haygarth terms it, or the period which elapſes between the expoſure to contagion and the firſt appearance of the diſeaſe which enſues, is aſcertained with tolerable accuracy in reſpect to the ſmall-pox; but in typhous caſes it appears to be extremely irregular. The ſmall-pox from inoculation uſually commences on the eighth or ninth day after the operation. Thus, of 810 inoculated caſes, in 519 fever commenced before the ninth, and 291 on or after the ninth day. But from the teſtimony of Drs. Woodville, Clark, and Currie, the eruptive fever ſometimes commences ſo early as the fifth day after inoculation; and three caſes are related by Dr. Clark where it commenced ſo late as the 16th, 17th, and 23d day. The latent period in the caſual ſmall-pox is ſomewhat longer than in the inoculated; moſt commonly from 10 to 16 days. (See Haygarth, Sketch, &c. before quoted.) The latent period of the contagion of meaſles is from 10 to 14 days. (Willan on Cutan. Diſ.) But the latent period of typhous infection is much more irregular, and often much longer. Of a large number of caſes ſtated by Dr. Haygarth, more than half commenced between the 17th and 33d day after expoſure, a great proportion after the 27th, and almoſt all between the 20th and 60th. (See Letter to Dr. Percival, p. 20. *et ſeq.*) The fever occurred in only five inſtances before the 10th day. So that on the whole, it appears, that the latent period of typhous infection varies from a few days to two months. (Ibid. p. 68.)

This latent infection is probably often allowed to lie long dormant, or is excited into action at an earlier period, according to the occurrence or non-occurrence of circumſtances which may render the conſtitution leſs capable of reſiſting its action. Thus perſons who had ſome time previouſly been expoſed to the influence of contagion, have been immediately taken ill upon being wet with rain, or on expoſure to a cold and damp air, or after a debauch, or other ſuch debilitating cauſes. During the prevalence of a peſtilence, it has been obſerved that expoſure to the damps of evening, eſpecially in warm countries, is extremely dangerous. And Dr. Chiſholm remarks, that thoſe who were addicted to the abuſe of intoxicating liquors, were moſt ſubject to the fever of Grenada. From the great length of time, indeed, which the contagion of fever often lies dormant, we may infer, with Dr. Lind, that it is probable, that, without the influence of theſe caſual exciting cauſes, the contagion might never, in ſuch inſtances, have affected the conſtitution.

Prevention of infection. The circumſtances under which contagion is generated, and the modes in which it is conveyed and propagated, being underſtood, the means of preventing its production, and of avoiding its pernicious influence, when it exiſts, will readily ſuggeſt themſelves. Inſtead of omitting all attempts at avoiding the contagion of a peſtilence, as altogether fruitleſs, where the very pabulum of life, the common air, is charged with poiſon; or of adopting the dangerous expedient of cloſing up every avenue of ventilation in our houſes (Wilſon on Fevers, p. 458. vol. i.), or of employing uſeleſs and abſurd meaſures of precaution, we ſhall proceed upon rational grounds to the uſe of effectual preventives. All thoſe who contend that the ſpreading of contagion depends upon ſome peculiar ſtate of the atmoſphere, admit that it is ſome *occult* quality in the air; that it is neither the heat nor the cold, the moiſture nor the dryneſs, nor any other ſenſible condition of it, with which peſtilence is connected. The great Sydenham, after having noted attentively the ſtate of the atmoſphere and the weather, in different years, during which epidemics of different kinds prevailed, was obliged to confeſs that he could perceive no difference in ſeaſons in which different contagious diſeaſes occurred. He, therefore, had recourſe to a ſuppoſition equally gratuitous, that ſome unwholeſome exhalations from the earth were the ſource of peſtilential diſeaſes.

But when it is conſidered, that contagion *originates* in accumulated and confined animal effluvia, and is *communicated* either to thoſe who approach, or come in contact with the ſick, or by means of ſubſtances impregnated with contagious matter, and in theſe ways only, the means of prevention are obvious.

With reſpect to the caſual origin of contagion, it is ſcarcely neceſſary to ſay, that cleanlineſs and ventilation, as they preclude the confinement and accumulation of the animal effluvia and ſecretions, will infallibly prevent the generation of the poiſon.

Where contagion exiſts, its farther communication may be prevented by avoiding contact or approach to the ſick, and by confining the patient to a ſeparate room, in which, if it be kept clean, and well ventilated, it has already been ſhewn, that the contagion will be inert, at a ſhort diſtance from the ſick; and therefore that the neceſſary attendants, and medical viſitors, will receive no injury from reſpiring the air within it. In this way contagion has been prevented from ſpreading in large ſchools, and other places, where a number of people live together, as in work houſes and hoſpitals, of which ſome examples have been already given. Dr. Haygarth's rules for the prevention of infection, ſeem to compriſe all the requiſite means to be adopted in houſes where contagious fever exiſts; they are the following.

Rules to prevent infection.

"1. As ſafety from danger entirely depends on cleanlineſs and free air, the chamber-door of a patient, ill of an infectious fever, eſpecially in the habitations of the poor, ſhould never be ſhut; a window in it ought to be generally open during the day, and frequently in the night. Such regulations would be highly uſeful both to the patient and nurſes; but are particularly important previous to the arrival of any viſitor.

"2. The bed curtains ſhould never be drawn cloſe round the patient; but only on the ſide next the light, ſo as to ſhade the face.

"3. Dirty clothes, utenſils, &c. ſhould be frequently changed, immediately immerſed in cold water, and waſhed clean when taken out of it.

"4. All diſcharges from the patient ſhould be inſtantly removed. The floor near the patient's bed ſhould be rubbed clean every day with a wet mop or cloth.

"5. The air in a ſick room has, at the ſame time, a more infectious quality in ſome parts of it, than in others. Viſitors and attendants ſhould avoid the current of the patient's breath,—the air which aſcends from his body, eſpecially if the curtains be cloſe,—and the vapour ariſing from all evacuations. When medical or other duties require a viſitor or nurſe to be placed in theſe ſituations of danger, infection may be frequently prevented by a temporary ſuſpenſion of reſpiration.

"6. Viſitors ſhould not go into an infected chamber with an empty ſtomach; and, in doubtful circumſtances, on coming out, they ſhould blow from the noſe, and ſpit from the mouth, any infectious poiſon which may have been drawn in by the breath, and may adhere to thoſe paſſages." (See Letter to Dr. Percival, p. 73. *et ſeq.*)

By obſerving theſe rules, not only numerous viſitors, but the medical attendants, and the nurſes themſelves, who frequently move and otherwiſe aſſiſt the ſick, in fever-wards, and the wards of houſes of recovery, entirely eſcape infection. This is proved, with ſcarcely any exception, in all the inſtitutions of this ſort throughout England and Ireland. During the laſt four years (the writer ſpeaks from perſonal obſervation) only one inſtance of infection ſeizing a nurſe in the London Houſe of Recovery, occurred, and, in that caſe, ſhe imprudently ſlept in a bed, juſt quitted by a convaleſcent, who had left the houſe, without changing the linen. By the ſame rules, Dr. Haygarth arreſted the progreſs of a ſcarlet fever and ſore throat in a ſchool, containing 37 boarders, at a time when Wincheſter and other great ſchools were diſperſing their ſcholars on account of this moſt contagious diſtemper, which had ſpread alarmingly among them. Not one was infected after the plan of ſeparation in an unviſited room was adopted, although all the boys remained in the ſame houſe. (Let. to Dr. Percival, p. 81.)

Contagion may, however, be extenſively circulated by *fomites*, i. e. attached to clothing, furniture, and other articles, which mode of communication is, perhaps, the moſt to be apprehended, during the prevalence of an epidemic malady. Hence the ſevere laws of quarantine have been enacted, in order to preſerve this country from the contagion of foreign peſtilence, which might be imported with the articles of commerce. And it is not leſs neceſſary, during times of internal peſtilence, to be watchful in regard to this point. It is not, however, by a ſlight and brief expoſure to contagious miaſms, that ſubſtances are ſufficiently imbued with them, to communicate infection. Thus it is, on the whole, well aſcertained that the clothes of viſitors do not acquire a peſtilential quality, ſo as to infect others. Upon this point, the experience of ſeveral obſerving practitioners coincides. Dr. Clark of Newcaſtle affirms, that in eighteen years practice, he never communicated the contagion of ſmall-pox, nor of the ſcarlet fever, with ulcerated ſore throat, to any one, even to children in his own family, although he had frequently, on the ſame day, viſited many patients in thoſe diſeaſes, and in the moſt malignant ſtages of the latter, and afterwards had intercourſe with other children liable to receive them. Mr. Henry adduces his own experience, during nearly forty years, in Mancheſter, in teſtimony of the ſame fact, in regard to the contagion of ſmall-pox. And the teſtimony of ſeveral other practitioners is equally ſtrong, as to the non-conveyance of this contagion by their clothes. Now, whatever is true of the contagion of ſmall-pox, and of ſcarlet fever, is ſtill more deciſive as to typhous infection, which is leſs powerful than either. (See Haygarth, Sketch of a Plan, &c. pp. 369, 386, 404, &c.) Subſtances do not become ſufficiently impregnated with the poiſon, in clean and ventilated places, except by being a conſiderable time in contact with, or very near the ſick, as the bed in which the patient lies, or the linen he wears; theſe *fomites* are chiefly produced in cloſe and dirty places, where the contagion is concentrated by accumulation and confinement, as in the cells of jails, or in the apartments of the poor; in which caſes, the utmoſt virulence of the poiſon is brought forth.

Where contagion of this degree of activity is produced, and is combined with articles of clothing and furniture, &c. the mere act of ventilation, which effectually prevents its deleterious action, when ariſing from the body of the ſick, is altogether inadequate to deſtroy its power in theſe *fomites*. Hence various means have been deviſed, in all ages, for annihilating contagion. Among theſe, fire has been moſt generally employed, more eſpecially with a view of fumigating, or applying the ſmoke or vapours from different ſubſtances, to the ſource of the poiſonous miaſms. Hippocrates and Acron of Agrigentum, believing the air to be the medium of infection, are ſaid to have ordered large piles of wood to be burnt in the ſtreets and infected parts of Athens, by which means they ſtayed the plague in that city. (Aetii *Tetrab.* Plutarch, de Iſid. et Oſir.) But however uſeful the fumigation of *fomites* may be, it does not appear to be of any utility when employed in the atmoſphere in general. In the year 1721, the plague raged at Toulon with ſuch violence, that in the ſpace of ten months it deſtroyed about two-thirds of its inhabitants. Many having inſiſted upon fires being made in different parts of the city, the public records were conſulted, and it was there found that, on a ſimilar occaſion, the ſame means had been tried without ſucceſs. The experiment, however, was repeated. Wood was laid before every houſe, and at the ſound of a bell, all the fires were lighted, by which the city was involved in a thick ſmoke for nearly a whole day. The plague, however, ſuffered no abatement. The ſame meaſure was reſorted to both at Marſeilles and London, when the plague raged in theſe cities, with no better ſucceſs. Nay, after the fires had been kept burning for three days in London, on the night which ſucceeded, no leſs than 4000 died, although not more than 12,000 had been deſtroyed during the preceding three or four weeks. (Wilſon on Feb. Diſ. vol. i. p. 464.)

There is no doubt, however, that contagion, adhering to clothes and furniture, may be effectually deſtroyed by the vapours from various combuſtible and volatile ſubſtances. Dr. Lind recommends the fumes of tobacco to be diſperſed through the cells and infected apartments, in priſons and ſhips, as well as for the purification of infected articles; he alſo adviſes the expoſure of fomites, to the fumes of ſulphur, from a charcoal fire, as an efficacious mode of purification. But he is perfectly convinced, he ſays, from long experience, that even the ſimple heat of a *cloſe confined* fire, or the heat of an oven, is a deſtroying power which "no infection whatever can reſiſt." The efficacy of gun-powder was aſcertained by an accident, and Dr. Lind afterwards uſed it in wards where fevers were received, every morning. In a ſhip of war, a contagious fever prevailed, which had deſtroyed ſixty men; when, in an engagement with the French, twenty-five barrels of gun-powder were fired on board of her during the action; and, to the ſurpriſe of her officers, none of her men were afterwards attacked with fevers.

Some ſtrong ſmelling ſubſtances, as camphor, the vapours of juniper, and of Caſcarilla bark, &c. have been occaſionally reſorted to as preventatives from contagion; but the power of theſe ſubſtances is very queſtionable, and they may be, perhaps, negatively prejudicial, as their aromatic odour may conceal the ſmell of bad air in the room of the ſick, and thus prevent effectual meaſures of ſafety from being employed.

The moſt efficacious of the means which we poſſeſs of deſtroying contagion in fomites, ſeem to be the fumes of the mineral acids. The vapours of vinegar, and thoſe of the ſulphureous acid, have been long uſed with ſome degree of ſucceſs; but thoſe of the muriatic, and ſtill more, perhaps, thoſe of the nitrous acid, appear to be complete antidotes to accumulated contagion. The evidence of the efficacy of the nitrous acid fume, in purifying infected places and ſubſtances, which was a few years ago laid before the Houſe of Commons by Dr. Carmichael Smyth, was ſuch as to induce that houſe to vote a national donation of five thouſand pounds to him for the diſcovery. This vapour is eaſily obtained, by mixing with powdered nitre a little of the ſtrong acid of vitriol or ſulphuric acid; the latter combines with the potaſs, the baſe of the nitre, expelling at the ſame time the nitrous acid in fumes. (See Dr. C. Smyth's treatiſe on the ſubject.) The vapour of the muriatic acid may be obtained in a ſimilar manner, by uſing common ſea or rock-ſalt, inſtead of nitre.

Where contagion has been long pent up in cloſe cells or rooms, it is apt even to adhere to the walls. In ſuch caſes, white-waſhing with hot or newly ſlaked lime, is an efficacious aid of the acid fumigations.

It is a curious fact, and perhaps wholly unaccountable upon any theory of the propagation of contagion, that peſtilential diſeaſes, after running an indefinite courſe, notwithſtanding all the meaſures adopted to reſtrain their progreſs, frequently ceaſe ſpontaneouſly, at a time when the walls of the houſes, furniture, &c. muſt ſtill be ſuppoſed to be highly impregnated with the contagion. The fact is authenticated by Dr. Ruſſell, Dr. Lind, and ſeveral other phyſicians of equal reſpectability. The ceſſation is not connected with any ſenſible changes in the atmoſphere. Warm weather is perhaps, on the whole, but not without many exceptions, more favourable to the production of contagious diſeaſes, than cold weather. But the worſt fevers have often raged in the coldeſt ſeaſons, as did the plague in London; and there have been inſtances of the plague ſuffering a check as the weather grew warmer. (Wilſon on Feb. Diſ. p. 448.)

During the prevalence of a contagious epidemic, temperance and regularity, and care in avoiding all cauſes of debility, (ſuch as cold damp air, &c.) the uſe of the cold bath, and the preſervation of an equal ſtate of mind, are great perſonal preſervatives. The general alarm which prevails during thoſe periods of public calamity, is not among the leaſt of the cauſes which contribute to extend the evil. It would be, therefore, injudicious to condemn the uſe of camphor, roſemary, and other aromatic ſubſtances, or carrying a quill filled with quickſilver, or other amulets, about the perſon, ſince whatever tends to inſpire confidence in the mind, contributes to the ſecurity of the body.

CONTARII, in *Antiquity*, a kind of horſemen, whoſe chief armour was the *contus*, a kind of long ſpear.

CONTARINI, Gaspard, in *Biography*, a cardinal of the church of Rome, was not more celebrated as a divine than as a politician. He flouriſhed in the Venetian territories, and was nominated from that republic as ambaſſador to the emperor Charles V., after which he was raiſed to a conſiderable ſtation in the government of his country. He was ambaſſador alſo to Rome; and when pope Clement VII. ſurrendered to the imperial army, a commiſſion was given to Contarini to negociate for the liberty of the pontiff. In 1535, he was created cardinal by pope Paul III.; and in 1541, he was appointed legate to Germany, and with the other legates was appointed to preſide at the general council, which was afterwards held at Trent; he was, however, ſent legate to Bologna, before that aſſembly met, where he died at the age of 59, in the year 1542. He was author of many works, and on various topics, in which he diſplays conſiderable talent, and a mind ſuperior to the times in which he lived. The principal pieces are "De Immortalitate Animæ," "De Septem Eccleſiæ Sacramentis," "De Poteſtate Papæ," "De Predeſtinatione," "De Libero Arbitrio," and "Confutatio Articulorum Lutheri."

Contarini, Vincent, a conſiderable ſcholar in claſſical literature and antiquities, was born at Venice, in 1577, and attained the profeſſorſhip of the Greek and Latin languages at Padua, which he held with great reputation till the year 1614, when he retired to Rome. From whence, taking a journey into Iſtria, he fell ill, and died at Venice in the prime of life, in 1617. The works by which he is chiefly known are "De Frumentaria Romanorum Largitione," and "De Militari Romanorum Stipendio." Moreri.

CONTARINO, Cav. Giovanni, an hiſtorical and portrait painter, who was born at Venice in the year 1549, and who ſtedfaſtly purſued the ſolid and pure ſtyle of Titian, notwithſtanding the pernicious example of almoſt all his rival compatriots, who, loſing the remembrance of thoſe glowing and rich tints which had ſo long been the boaſt of the Venetian ſchool, had adopted a manner in which the lights were ſo extravagantly contraſted by the moſt obſcure and cutting ſhadows, as to give to their pictures the appearance and gloom of midnight repreſentations. The principal works of Contarino are at Venice, and evince, independent of the beauties of colouring, a very competent knowledge of fore-ſhortening and the *ſotto in ſu*, with an excellent taſte of compoſition. One of his beſt and greateſt performances is the ceiling of the church of St. Franciſco di Paola, where, in the centre, he painted the Reſurrection of Chriſt, and on each ſide the Annunciation and Nativity, together with the Evangeliſts and the four Doctors of the Church. He executed ſeveral conſiderable works for the court of the emperor Ridolfus II., who conferred on him the honour of knighthood. His portraits bore ſo ſtrong a reſemblance to nature, that one of them, repreſenting Marco Dolce, is ſaid to have deceived his dogs and other domeſtic animals, who leaped up to the picture, ſuppoſing it their maſter himſelf. This artiſt died in the 56th year of his age, 1605. Lanzi, Storia Pittorica.

CONTAY, in *Geography*. See Conty.

CONTCHOUDSONG, a town of Aſia, in the country of Thibet; 380 miles E.N.E. of Laſſa. N. lat. 30° 20'. E. long. 97° 29'.

CONTE, del, Jacopino, in *Biography*, was born at Florence in 1510, and is ſaid in his youth to have received ſome inſtructions in painting, in the ſchool of Andrea del Sarto. Having completed his ſtudies, he ſoon gave proofs of ſuperior talents, both in hiſtorical and portrait painting. Rome, whither he was invited under pope Paul III., was the theatre of his labours, and he was employed to paint the portraits of that pontiff and of his ſucceſſor Clement VIII., as well as thoſe of the cardinals, the ambaſſadors, and other nobles of the court. In hiſtorical painting, he had no leſs ſucceſs; and the freſcoes, which he executed in the church of St. Giovanni Decollato, rank him amongſt the leaſt affected or extravagant of the imitators of Michelangelo. An altar-piece in the ſame church, repreſenting the taking down from the croſs, a compoſition of many figures, is conſidered his *chef d'ouvre*. He died at Rome in 1598. Baglione.

Conte, del, or Fassi, Guido, an artiſt who was born at Carpi, in the ſtate of Modena, in the year 1584, and was the firſt inventor of the *ſcagiiola*, a ſpecies of compoſition, or paſte, with which the fineſt marbles are with facility imitated, and which acquires ſufficient hardneſs to bear a poliſh. Some of the works of Guido, particularly two altars, are ſtill exiſting at Carpi, where he died in the year 1649.

This art has ſince been brought to ſuch a degree of perfection in ſeveral parts of Italy, that not only the fineſt marbles have been counterfeited, ſo as occaſionally to deceive the beſt judges; but likewiſe bas-relievos, vaſes, medals, and even pictures of great beauty, have been produced; inſomuch that it is become an article of commerce. (See Scagliola.) Lanzi, Storia Pittorica.

CONTEMPLATION, an act of the mind, whereby it applies itſelf to conſider, reflect on, and admire, the wonderful works of God, nature, &c.

Contemplation is the height of perfection of the myſtic divines. See Mystic.

CONTEMPORARY, or Cotemporary, a perſon, or thing, of the ſame time, or that exiſted in the ſame age, with another. Socrates, Plato, and Ariſtophanes, were contemporaries: the beſt hiſtories are thoſe of contemporary authors.

CONTEMPT, in the *Doctrine of the Paſſions*, is a ſpecies of hatred, expreſſing in its general ſenſe diſapprobation or averſion, which ariſes from the mere conſideration of a worthleſs object, eſpecially if it be propoſed to us under a pretence of its poſſeſſing excellence, or from miſconduct in things not of themſelves vicious; as, where a perſon either acts below his ſtation and character, or affects to do that for which he is not qualified. It is oppoſed to eſteem or to emulation. This is one of thoſe paſſions which in oratory belongs to demonſtrative diſcourſes. Thus Cicero (De Orat. lib. ii. c. 12.) endeavours to expoſe Cæcilius, and bring him into contempt of the court, for pretending to rival him in the accuſation of Verres, for which he was altogether unfit.

Contempt, in *Law*, is diſobedience to the rules, orders, or proceſs of a court, which hath power to puniſh ſuch offence; and a man may be impriſoned for a contempt done in court, but not for a contempt out of court, or for private abuſe. But for contempt out of court, an attachment may be granted. Cro. Eliz. 689.

Attachment alſo lies for contempt to the court, to bring in the offender to anſwer on interrogatories, &c. and if he cannot acquit himſelf, he ſhall be fined. 1 Lill. 305. If a ſheriff, being required to return a writ directed to him, doth not return the writ, it is a contempt: and this word is uſed for a kind of miſdemeſnor, by doing ſomething that is forbidden, or not doing what is commanded. 12 Rep. 36. As the degrees of this crime vary, the puniſhment is leſs or greater; ſometimes a mere fine, and ſometimes impriſonment.

If a defendant in chancery, on ſervice of a ſubpœna, does not appear within the time limited, by the rules of the court, and plead, demur, or anſwer to the bill againſt him, he is then ſaid to be in contempt; and the reſpective proceſſes of contempt are in ſucceſſive order awarded againſt him: theſe are attachment; attachment with proclamation; a commiſſion of rebellion; and, finally, a ſequeſtration. It is a contempt to inſtitute a ſuit fictitiouſly, though the demand is real, either to hurt any perſon, or to get the opinion of the court.

The moſt remarkable inſtances of contempts may be reduced to the following heads, *viz.* contempts of the king's writs; contempts in the face of a court; contemptuous words or writings concerning the court; contempts of the rules or awards of the court; abuſe of the proceſs of the courts; and forgeries of writs and other deceits tending to impoſe on the court. 2 Hawk. P. C. c. 22. § 3. For an account of the contempts that are puniſhed by attachment; ſee Attachment.

Contempts or miſpriſions (ſee Misprision) are offences againſt the king and government: ſuch is the mal-adminiſtration of high officers, in public truſt and employment, uſually puniſhable by the method of parliamentary impeachment, and ſubject to the penalties of baniſhment, impriſonment, fines, or perpetual diſability: ſuch is alſo the offence of embezzling the public money; and ſuch are thoſe contempts of the executive magiſtrate, which demonſtrate themſelves by ſome arrogant and undutiful behaviour towards the king and government. Contempts againſt the king's prerogative are a refuſal to aſſiſt him by advice in his councils, and by perſonal ſervice in his wars, againſt a rebellion or invaſion. To this claſs may be referred the neglect of joining the "poſſe comitatus," or power of the county, when required by the ſheriff or juſtices, according to the ſtatute 2 Hen. V. c. 8; which is a duty incumbent upon all that are 15 years of age, under the degree of nobility, and able to travel. Contempts againſt the prerogative are alſo a preference of the intereſts of a foreign potentate to thoſe of our own, and doing or receiving any thing that may create an undue influence in favour of ſuch extrinſic power; as by taking a penſion from any foreign prince, without the king's conſent; alſo, a diſobedience to the king's lawful commands, iſſuing by writs out of his courts of juſtice, or by ſummons to attend his privy council, or by letters from the king commanding a ſubject to return from beyond the ſeas: and likewiſe diſobedience to any act of parliament; all which contempts are puniſhable by fine and impriſonment, at the diſcretion of the king's courts of juſtice. Contempts and miſpriſions againſt the king's perſon and government may be by ſpeaking or writing againſt them, curſing or wiſhing him ill, giving out ſcandalous ſtories concerning him, or doing any thing that may tend to degrade him in the eſteem of his ſubjects, weaken his government, or excite jealouſies between him and his people. Contempts againſt the king's title, not amounting to treaſon or præmunire, are the denial of his right to the crown, in common and unadviſed diſcourſe; puniſhable by our law with fine and impriſonment. If any perſon affirm or maintain, that the common laws of this realm, not altered by parliament, ought not to direct the right of the crown of England; this is a miſdemeſnor, by ſtat. 13 Eliz. c. 1, and puniſhable with forfeiture of goods and chattels. A contempt may alſo ariſe from refuſing or neglecting to take the oaths, appointed by ſtatute for the better ſecuring of the government; and yet acting in a public office, place of truſt, or other capacity, requiring the ſaid oaths to be taken, *viz.* thoſe of allegiance, ſupremacy, and abjuration; which ſhould be taken within ſix calendar months after admiſſion. The penalties inflicted by ſtatute 1 Geo. I. ſtat. 2. c. 13, are little ſhort of thoſe of a præmunire; being an incapacity to hold the ſaid offices, or any other; to proſecute any ſuit; to be guardian or executor; to take any legacy or deed of gift; and to vote at any election for member of parliament: and after conviction the offender ſhall alſo forfeit 500*l.* to thoſe who will ſue for it. Contempts againſt the king's palaces or courts of juſtice have always been regarded as high miſpriſions; and by the ancient law, before the conqueſt, fighting in the king's palace, or before the king's judges, was puniſhed with death. And at preſent with us, by ſtat. 33 Hen. VIII. c. 12, malicious ſtriking in the king's palace, where he reſides, whereby blood is drawn, is puniſhable by perpetual impriſonment and fine at the king's pleaſure; and alſo with loſs of the offender's right hand. But ſtriking in the king's ſuperior courts of juſtice, in Weſtminſter-hall, or at the aſſiſes, is made ſtill more penal. By the ancient common law, before the conqueſt, it was a capital felony; and our modern law ſubſtitutes for the loſs of life that of the offending limb; the crime, and even drawing a weapon, being puniſhable with the loſs of the right hand, impriſonment for life, and forfeiture of goods and chattels, and of the profits of the offender's lands during life. (See Assault, &c.) A reſcue of a priſoner from any of the ſaid courts, without a blow, is puniſhed with perpetual impriſonment, and forfeiture of goods, and of the profits of lands during life. Even in the inferior courts of the king, an affray, or contemptuous behaviour, is puniſhable with a fine by the judges there ſitting; as by the ſteward in a court-leet, or the like. Thoſe alſo who are guilty of any injurious treatment to ſuch as are immediately under the protection of a court of juſtice, are puniſhable by fine and impriſonment. Laſtly, to endeavour to diſſuade a witneſs from giving evidence; to diſcloſe an examination before the privy-council; or to adviſe a priſoner to ſtand mute, are high miſpriſions and contempts of the king's courts, and puniſhable by fine and impriſonment. If one of the grand jury diſcloſes to any perſon indicted the evidence that appeared againſt him, he is guilty of a high miſpriſion, and liable to be fined and impriſoned. Blackſt. Comm. vol. iv.

CONTENEBRA, in *Ancient Geography*, a town of Italy, in Etruria, mentioned by Livy.

CONTENEMENT, a word, in our *Ancient Law-books*, about whoſe ſignification authors are not rightly agreed. According to ſome, it ſhould ſignify the countenance, credit, or reputation, a perſon has, from and by reaſon of his freehold. In which ſenſe it is uſed in the ſtat. 1 Edw. III. &c. where it ſtands as ſynonymous with *countenance.*

Others will have it ſignify what is neceſſary for the ſupport and maintenance of men, according to their ſeveral qualities, conditions, or ſtates of life. Thus, Spelman, *Contenementum eſt æſtimatio, & conditionis forma, qua quis in republica ſubſiſtit.* And in this ſenſe it occurs in Magna Charta, cap. 14.

CONTENSON, Vincent, in *Biography*, a French Dominican monk, was born at Condom, in 1640, and celebrated in his time for conſiderable pulpit talents. He left behind him a work of reputation, entitled, "Theologia mentis et cordis," which has paſſed through ſeveral editions in folio and in octavo.

CONTENT, in *Mathematics*, a term frequently uſed for the capacity of a veſſel, or the area of ſpace; or the quantity of any matter, or ſpace, included in certain bounds. The content of a tun of round timber is 43 ſolid feet. A load of hewn timber contains 50 cubic feet: in a foot of timber are contained 1728 cubic or ſquare inches, and as often as 1728 inches are contained in a piece of timber, be it round, or ſquare; ſo many feet of timber are contained in the piece.

In gauging, the gallon for beer and ale is allowed to contain 282 cubic inches, and the wine gallon 231; the gallon of dry meaſure 272.

Hence, as oft as 282 cubic inches are contained in any veſſel, round or ſquare; ſo many gallons of ale or beer it holds; and the like may be obſerved of the other meaſures.

Multiply, therefore, one ſide of a ſquare, or oblong, into the other; and divide by one of thoſe numbers, according to the quality of the liquor; the quotient gives the area in gallons, upon an inch deep.

Though the work may be conſiderably ſhortened by only multiplying the ſides of ſquares, or the diameters of rounds, into themſelves; the product is the number of gallons, and parts, the veſſel contains, upon an inch in depth: and when that receives an augmentation, by being two, three, or four inches deep, it then commences a ſolid body, and contains as many gallons, and parts, as it has inches and parts deep.

A cubic foot contains ſix gallons and almoſt a pint of ale and beer; and ſeven gallons two quarts of wine. A cubic foot of dry meaſure contains ſix gallons and a half, and ſomething more. A buſhel of ſalt contains 56 pounds avoirdupoiſe. See Gauging.

CONTENTIOUS Jurisdiction, in *Law*, denotes a court, or aſſembly, which has a power to judge and determine differences between contending parties.

The lords chief juſtices, judges, &c. have a *contentious juriſdiction;* but the lords of the treaſury, the commiſſioners of cuſtoms, &c. have none; being merely judges of accompts and tranſactions.

CONTENTMENT, in *Pathology* and *Ethics*, expreſſes the acquieſcence of the mind in the poſſeſſion of the good that is aſſigned to us. It implies a perception that our lot might have been better, or that it is inferior to what others enjoy, or that it does not fully anſwer the expectations we had formed. An effort of reaſon, or of prudence, or of religious principles, is neceſſary to produce it. We compare our preſent with our former ſituation, or with the inferior lot of others; and thus learn to acquieſce in the degree of advantage which we have obtained. A regard to the diſpoſals of Providence, wiſe, righteous, and benevolent, will very much contribute to the acquiſition and exerciſe of the virtue of contentment.

CONTESSA, in *Geography*, a ſmall town of European Turkey, in the province of Macedonia, ſituated in the bay of the ſame name, with a good harbour, on the coaſts of the Archipelago; 54 miles N.E. of Salonica. Long. 41° 35′. At the entrance of the gulf of Conteſſa is ſituated the iſland of *Taſſo*. The French navigators alſo call this bight "Golfe de Rhondine," from the corrupted name of the ancient town of *Rhedine;* but the Greeks deſignate it under the name of *Orfano*. It is the *Sinus Strymonicus* of the ancients.

CONTESTANI, in *Ancient Geography*, a people of Hiſpania Citerior, to the ſouth of the Edetani. Their territory extended ſouthwards as far as Betica, or at leaſt to the extremity of the Tarragonenſis, where are found ſome places dependent on the Baſtitani, who inhabited part of the eaſtern Betica.

CONTESTANIA, a country of Spain, in the Tarragonenſis, mentioned both by Pliny and Ptolemy. The former ſays, that this country was firſt called "Mavitania," afterwards "Deitania," and then *Conteſtania*. Here theſe authors place the river Tader, the colony of Illici, Lacentum, Dianium, the river Sacro, &c.

CONTESTATIO Litis, among *Civilians*, denotes a general aſſertion that the plaintiff hath no ground of action, which aſſertion is afterwards extended and maintained in his plea.

CONTEXT, among *Divines* and *Critics*, that part of Scripture, or other writing, which lies about the text, before or after it, or both. To take the full and genuine ſenſe of the text, the context ſhould be regarded.

CONTEXTURE, a word frequently uſed in ſpeaking both of the works of nature and art; and denoting the diſpoſition and union of the conſtituent parts with reſpect to one another.

CONTHIL, in *Geography*, a town of France, in the department of the Meurthe, and diſtrict of Chateau-Salins; 2 leagues N.N.W. of Dieuze.

CONTHILA, in *Ancient Geography*, a borough of Greece, in Attica; placed by ſome in the Ptolemaide tribe, and by others in the Pandionide.

CONTI, Giusto De, in *Biography*, an Italian poet and lawyer. His verſes are chiefly amatory; and they appeared under the title of "Bella Mano," on account of the beautiful hand of his miſtreſs, which is the ſubject of frequent adulation. He died in 1409, and his poems have been publiſhed at Venice, Paris, Verona, and Florence. He has been compared to Petrarch; but the beſt judges have regarded him as much inferior to that writer. Moreri.

Conti, Cesare and Vincenzio, two brothers, the former, a native of Ancona, was celebrated as an expeditious painter of groteſques; the latter, born at Rome, was a painter of hiſtory.

Baglione enumerates many conſiderable works, in which both theſe artiſts were employed at Rome, under the pontificate of Sixtus V. and Gregory XIII. Vincenzio ultimately ſettled in Turin, where he was taken into the ſervice of the duke of Savoy. They both died during the pontificate of Paul V. Baglione.

Conti, Domenico, of Florence, was the beloved diſciple of Andrea del Sarto, and heir to his deſigns and ſtudies. In gratitude and veneration to the memory of his great maſter, Conti, at his own expence, erected the monument ſtill remaining in the cloiſter of the Nunziata, where the buſt of Andrea is finely ſculptured by the hand of Raffaello di Monte Lupo. Of Domenico's works in painting little is now known. Orlandi.

Conti, Carlo, an engraver, native of Lorraine, in 1742. He eſtabliſhed himſelf at Vienna, where he was reputed a good artiſt. He was living in 1790. Heinecken.

Conti, Francesco, an hiſtorical painter, born at Florence, in the year 1681. He travelled to Rome, where he became the diſciple of Carlo Maratti. On his return, he acquired ſufficient reputation to merit a place in the celebrated collection of portraits in the Florentine gallery. He died in the year 1760. Lanzi, Storia Pitt.

Conti, Luca, an engraver and architect, who was born in 1749, and became the diſciple of Cleriſſeau. He eſtabliſhed himſelf at Paris, where he continued to follow his profeſſion in 1790. Heinecken.

Conti, Gioachino. See Gizziello.

CONTIGLIANO, in *Geography*, a town of Italy, in the duchy of Spoleto, near a lake to which it gives name; 3 leagues W. from Rieti.

CONTIGNE, a town of France, in the department of the Maine and Loire, and diſtrict of Segré; 3 miles N. of Chateauneuf.

CONTIGUITY, the relation of bodies touching one another. See Continuity.

CONTIGUOUS, a relative term, underſtood of things diſpoſed ſo near each other, that they join their ſurfaces, or touch.

The houſes in ancient Rome were not contiguous as ours are, but all inſulated.

Contiguous *angles*, in *Geometry*, are ſuch as have one leg common to each angle; otherwiſe called *adjoining angles*, in contradiſtinction to thoſe produced by continuing their legs through the point of contact, which are called *oppoſite* or *vertical angles*.

CONTINENCE, in *Ethics*, a moral virtue, by which we reſiſt concupiſcence. It ſhould ſeem that there is this diſtinction between *chaſtity* and *continence*, in that it requires no effort to be chaſte, which reſults from conſtitution; whereas *continence* appears to be the conſequence of victory gained over ourſelves. The verb *continere*, in Latin, ſignifies *to reſtrain*.

CONTINENT, in *Geography*, a terra firma, main land, or a large extent of country, not interrupted by ſeas: ſo called, in oppoſition to *iſland*, *peninſula*, &c. See Earth, Ocean, &c.

Sicily is ſaid to have been anciently torn from the continent of Italy; and it is an old tradition, which ſome of our antiquaries have ſtill a regard to, that Britain was formerly a part of the continent of France.

Mr. Kirwan ſuppoſes (ſee Iriſh Tranſ. vol. vi. p. 298.) that, when by the rupture of the Thracian Boſphorus, or iſthmus which connected the Caſpian, the lake of Aral, and the Black Sea, on the one ſide, and of the African iſthmus, which joined Ceuta with Gibraltar on the other, the waters of the Ocean and of the Euxine were forced in upon the Mediterranean, an immenſe preſſure took place upon its bed, under which it ſunk or fell into the interior cavity of the globe; during this tremendous tumult the iſlands of Sicily, Sardinia, Corſica, and thoſe of the Archipelago, were torn off from the Continent, and Italy was lengthened to its preſent ſhape. The ſeparation of Sicily from Italy is vouched by ancient traditions, as may be ſeen in Pliny, Ovid, and Claudian.

> "Zancle quoque juncta fuiſſe
> Dicitur Italiæ, donec confinia pontus
> Abſtulit, et mediá tellurem repulit unda."
> Ovid. Met. l. xv. v. 290.
>
> "Trinacria quondam
> Italiæ pars una fuit, ſed pontus et ceſtus
> Mutavere ſitum, rupit confinia Nereus,
> Victor, et abſciſſo interluit æquore montes."
> Claud. de Rep. Proſ. l. 1.

The entire ſeparation of Great Britain from the Continent muſt have happened long after the deluge, and that of Ireland from Great Britain at a ſtill later period; for wolves and bears were anciently found in both, and theſe muſt have paſſed from the Continent into Britain, and hence into Ireland, as it cannot reaſonably be ſuppoſed that they were imported thither. The divulſive force, ſays Kirwan (*ubi ſupra*), that ſeparated Britain from Germany, ſeems to have been directed from North to South, but gradually weakened in its progreſs. Hence that iſland is ſharpened northwards; but the impreſſion muſt have been conſiderably weakened by the oppoſition of the granitic mountains that form the Shetland and Orkney iſles. The rupture of the iſthmus that joined Calais and Dover was probably effected by an earthquake at a later period, and gradually widened by tides and currents. Ireland was protected by Scotland from the violence of the northern ſhock; and therefore its ſeparation from Scotland appears to have been late and gradual. That from England was probably diluvial, and effected by a ſouthern ſhock. All theſe changes happened 3600 years ago; and there is no reaſon for thinking that the general level of the ocean has been ſince altered; but that of the continents ſeems to have varied conſiderably, being in ſome places higher and in ſome lower than it was in ancient times.

The world is ordinarily divided into two grand continents; the Old and the New; the Old comprehends Europe, Aſia, and Africa; the New the two Americas, North and South.

The ſeparation of the two continents Kirwan (*ubi ſupra*) ſuppoſes to have probably been the effect of excavation by volcanos; at leaſt, he ſays, this cauſe is adequate to ſuch an effect, and it ſtill exiſts in the moſt northern parts; the ſuperior fertility of the weſtern coaſt of America may ariſe from the lavas ejected on that coaſt. But however this ſeparation was effected, we have no traditional account of it, and the period in which it happened is no leſs difficult to be aſcertained than the cauſes which produced it.

M. Buffon affirms, that they were not ſeparated when the elephants lived equally in the north of Europe, Aſia, and America, the bones of which have been found in Ruſſia, Siberia, and Canada. Hence he concludes, that the ſeparation of the two Continents muſt have happened after the abode of theſe animals in the northern regions. But it has been doubted whether the remains of elephants and of the rhinoceròs that have been lately found in Siberia, even allowing that the temperature of this country was ever ſo ſuited to the conſtitution of theſe animals as to admit of their living in it, belonged to animals which ever lived in it. As to the mode of their formation, we have different conjectures and theories, of which an account will be given under the articles DELUGE and EARTH.

M. Buffon obſerves (See Smellie's Tranſlation, vol. i.) that the ſurface of the earth is divided, from one pole to the other, into two belts of land, and two of ſea. The firſt and principal belt is the ancient Continent, the greateſt length of which is a line commencing at the moſt eaſtern point of the north of Tartary, and extending from thence to the neighbourhood of the gulf of Linchidolin, where the Ruſſians fiſh for whales, from thence to Tobolſki; from Tobolſki to the Caſpian ſea; from the Caſpian ſea to Mecca: from Mecca to the weſtern part of the country inhabited by the Galli in Africa; from thence to Monoemuci, or Monomotapa; and, laſtly, to the Cape of Good Hope. This line is about 3600 leagues in length (each league being about 2000 or 2100 fathoms long, and about 27 of them making a degree), and is never interrupted but by the Caſpian and the Red Seas, which are of inconſiderable breadth. This greateſt length of the Old Continent forms a diagonal line; for, if meaſured by a meridian, it will appear, that from the northernmoſt point of Lapland to the Cape of Good Hope, exceeds not 2500 leagues; and that this line, though ſhorter, meets with greater interruption from the Baltic and Mediterranean. With regard to all other lines which could be drawn under the ſame meridians in the Old Continent, they muſt ſtill be ſhorter than thoſe above-mentioned. *E. G.* From the moſt ſouthern point of the iſland of Ceylon to the northernmoſt coaſt of Nova Zembla, the diſtance is 1800 leagues. Thus alſo, if the Continent be meaſured by lines parallel to the equator, its greateſt length, without much interruption by ſeas, will ſtretch from Treſana, on the weſt coaſt of Africa, to Ninpo, on the eaſt coaſt of China, which is about 2800 leagues. Another line may begin near Breſt, and extend to the coaſt of Chineſe Tartary, which will be nearly 2300 leagues. From Bergen in Norway to the coaſt of Kamtſchatka the diſtance is only 1800 leagues. All theſe lines are much ſhorter than the firſt. Hence the greateſt length of the Old Continent extends from the eaſtern point of Tartary to the Cape of Good Hope, and is about 3600 leagues. This line may be conſidered as the middle of the ancient Continent; for in meaſuring the ſurface on each ſide of it, M. Buffon found, that, on the left there are 2,471,092$\frac{3}{4}$ ſquare leagues; and on the right, 2,469,687, which two lines differ only by 1405$\frac{3}{4}$ leagues, or barely 1$\frac{1}{2}$ degree ſquare. Hence the Old Continent contains about 4,940,780 ſquare leagues, which is not one fifth part of the earth's ſurface, and may be regarded as a large belt of earth, with an inclination to the equator ſomewhat more than 30 degrees.

The New Continent is another belt of earth, the greateſt length of which may be taken from the mouth of the river Plata to the lake of the Aſſiniboils. This line paſſes from the mouth of the river Plata to lake Caracara; from thence to Mataguais, Pocona, Zongo, Mariana, Morua, St. Fé, and Carthagena; then it paſſes through the gulf of

Mexico to Jamaica and Cuba; from thence along the peninſula of Florida, through Apalache, Chicachas; and from thence to St. Louis, Fort le Sueur; and terminates in the country bordering on lake Aſſiniboils, the extent of which is unknown. This line is interrupted only by the gulf of Mexico, is about 2500 leagues in length, and divides the New Continent nearly into two equal parts; that on the left containing 1,069,286$\frac{5}{6}$ ſquare leagues, and that on the right 1,070,926$\frac{1}{12}$; the difference of which is 1639$\frac{3}{4}$, or ſcarcely 1$\frac{1}{5}$ degree ſquare. This line is the middle of a belt of land, called the New Continent, and is inclined to the equator ſomewhat leſs than 30°, but in an oppoſite direction to the former; for that of the Old Continent extends from the N. E. to the S. W.; but that of the New Continent from N.W. to S. E. The ſuperficial contents of the Old and New Continents are about 7,080.993 ſquare leagues, *i. e.* not near a third part of the ſurface of the globe, which contains 25,000,000 ſquare leagues. Of theſe lines which divide the Continents into equal parts, it may be remarked, that they both terminate at the ſame degrees of N. and S. latitude; and that the two Continents make mutual advances, or projections, exactly oppoſite to each other; *viz.* thoſe on the African coaſt, from the Canary iſles to Guinea; and thoſe of America, from Guiana to the mouth of the Rio-Janeiro. It appears, therefore, that the moſt ancient lands on the globe are thoſe which extend from 200 to 250 leagues on each ſide of the two lines above deſcribed.

Agreeably to this idea, it is found that, in the Old Continent, the moſt ancient countries of Africa are thoſe which ſtretch from the Cape of Good Hope to the Red Sea and Upper Egypt, and are about 500 leagues broad; and, conſequently, that the whole weſtern coaſt of Africa, from Guinea to the ſtraits of Gibraltar, are new lands. In the ſame manner, if we trace this line through Aſia, and include an equal breadth, we ſhall find, that the moſt ancient countries are, the two Arabias, Perſia, Georgia, Turcomania, a part of independent Tartary, Circaſſia, part of Muſcovy, &c.; and, of courſe, that Europe, and perhaps alſo China, and the eaſtern part of Tartary, are comparatively new countries.

In the New Continent, we ſhall likewiſe find, that Terra Magellanica, the eaſtern part of Brazil, of the country of the Amazons, of Guiana, and of Canada, are new lands, when compared with Tucuman, Peru, Terra Firma, the iſlands in the gulf of Mexico, Florida, the Miſſiſippi, and Mexico. Moreover it may be obſerved, that the Old and New Continents are nearly oppoſite to one another. The Old Continent extends farther north of the equator than ſouth; but the New, farther ſouth than north. The centre of the Old Continent lies in the 16th or 18th degree of N. latitude; and the centre of the New Continent lies in the 16th or 18th degree of S. latitude; as if they were intended to counterbalance each other. Beſides, both continents reſemble one another in this reſpect that they might be divided into two portions, which would be ſurrounded on all ſides by the ſea, except the two ſmall iſthmuſes of Suez and Panama.

It is obſervable that the prodigious chains of mountains in theſe two continents run from W. to E. in the Old Continent, and from N. to S. in the New. In the Old Continent there are about 430 rivers which directly fall either into the Ocean, or into the Mediterranean and Black ſeas. But in the New Continent we know only of 135 rivers which fall immediately into the ſea. Both the Old and New Continents appear to have been encroached upon by the Ocean in the ſame latitudes: both are furniſhed with a great Mediterranean and a vaſt number of iſlands, which likewiſe lie nearly in the ſame latitudes. The only difference is, that the Old Continent, being much larger than the New, has a Mediterranean on its weſt coaſt, to which the New Continent has nothing analogous. But both ſeem to have undergone ſimilar revolutions. Theſe revolutions are greateſt near their middle parts, or between the tropics, where the motion of the ſea is moſt violent. For other particulars relating to theſe Continents, we refer to the deſcription of their reſpective countries.

It has been remarked, that a conſiderable portion of the elevated and ſolid matters or ſtrata which form our Continents, are oppoſite to a large or deep ocean at the anti-podes or oppoſite ſide of the earth: and this circumſtance affords matter for important reflections, when we take into our account that theſe parts, now ſo conſiderably elevated above the level of the Ocean, once formed part of its bottom, as appears from the nature and diſpoſition of the ſtrata themſelves, but more eſpecially from the ſhells and other aquatic remains found lodged in them, in a perfect and unbroken ſtate, lying in the ſame manner and poſitions, as the ſhells, &c. of living animals are found to be diſtributed, on the bottom of the ſea, in places where divers have had opportunities of examining them. The following queſtions here naturally preſent themſelves; has the quantity of water on the ſurface of the earth been ſo much diminiſhed, as to lay the continents thus bare; or, has the centre of gravity of the earth been ſo deranged, as to occaſion the waters to accumulate in particular places and leave others uncovered? For a long time there ſeemed little difficulty in ſolving the myſtery, by anſwering the firſt queſtion in the affirmative, on the principles of thoſe who maintained, that the earth was only a hollow cruſt or ſhell of matter, and that great part of the waters of the univerſal ocean had retreated into the internal cavities of the globe. But ſince the labours of Britiſh philoſophers have concurred in proving, that the ſpecific gravity of the entire or compound maſs of the terraqueous globe is 5 times that of water, while all the water exiſting in or upon the earth, (of ſp. grav. 1, or little more) and all the earths and ſtones (whoſe ſpecific gravities do not exceed 2$\frac{1}{2}$ or 2$\frac{3}{4}$ on the average) are included; we are forced to conclude, not only that the central parts of the globe are ſolid, but compoſed alſo of much heavier materials, than thoſe which conſtitute the ſuperficial ſtrata. Another circumſtance alſo concurs to ſhew the improbability, of any large caverns now exiſting, filled with water in the interior parts of the earth, *viz.* the fiſſures, which ſo univerſally are found, breaking and dividing even the hardeſt rocks and ſtrata, into comparatively ſmall and irregular fragments, ſo as to render them incapable of arching or ſupporting themſelves over water without an actual contact or bearing upon each other: and accordingly caverns or grottos of any conſiderable ſize are rarely met with in mining, and theſe principally, if not entirely, in very hard lime-ſtone ſtrata, near the ſurface, and carrying but a comparatively ſmall load of ſuperincumbent ſtrata.

This ruptured and broken ſtate of the ſolid matters of the globe, has probably fitted them for obeying the action of the centrifugal force generated by its diurnal revolution, and for aſſuming nearly the form of an *ellipſoid* (as the late meaſurements of degrees upon the earth's ſurface in various parts of the world have ſhewn;) otherwiſe, moſt probably, the equatorial parts of the earth muſt have been occupied by a zone of water inſtead of poſſeſſing Iſlands and parts of Continents in common with other parts of the world, as they now do. Let the reader but conſider the immenſe weight of ſolid matter which exiſts above the level of the ſea, or general ellipſoidal lines of equilibrium, in one of our Continents; and ſuppoſe a cylindrical perforation to be made under ſuch Continent, quite through the earth to the oppoſite ocean, ſo as to ſeparate, for the ſake of argument, this cylindrical column of the earth and water from the reſt of the earth, (as the broken ſtate of the ſtrata and the actual hardneſs of their fragments entitles us to ſuppoſe poſſible) and it will appear, as a neceſſary conſequence of equilibrium, that the continent and ſtrata under it to the centre of the earth muſt be equal in weight to the ſame ſpace of Ocean at the antipodes, and the ſtrata under its bottom extending to the ſame centre ; for if theſe were different, and we ſuppoſe the Continent to preponderate, it is plain from the waters of the Ocean covering the other end of the cylinder being at liberty to recede, that they would do ſo, and the Continent would ſink and the bottom of the oppoſite Ocean would riſe, until the equilibrium was reſtored : and in like manner if the ſtrata under the ocean be ſuppoſed the heavieſt, a further protruſion and conſequent elevation of the Continent, compared with its ſurrounding ſeas, would enſue. This view of the ſubject leads, in the opinion of the writer of this part of our article, to the concluſion, that a very large maſs, or perhaps ſeveral maſſes of matter of a high ſpecific gravity, now occupy the bottom of the Ocean oppoſite to the Continents and large iſlands, which were not there at the time that theſe Continents occupied a lower place in reſpect to the centre of the earth, and were covered by the univerſal Ocean : and he thinks, that he has diſcovered the ſource whence theſe very heavy and diſturbing maſſes of matter were derived, in the diſappearance of ſome immenſe ſatellitic body which apparently for a long period revolved round this earth, very near to its ſurface, and occaſioned tides ſo rapid and enormous, as to heave up the land and break the ſtrata into innumerable fragments, permanently denudating ſome parts, when elevated above the point of equilibrium between the earth and ſatellite's attraction, and pouring down upon other parts of the ſurface, ſuch torrents of the ruins of abraded ſtrata, as entirely to hide the ſtrata of theſe diſtricts under alluvial coverings ; forming, in numerous inſtances, hills of great height and extent, containing large and irregular fragments of rocks, and different known ſtrata, thrown together throughout their whole thickneſs and extent, in the greateſt apparent confuſion. For other obſervations and conjectures, relating to this ſubject ; ſee EARTH.

The diſcovery of a ſouthern Continent has been an object of curious and diligent inveſtigation ; but hitherto without ſucceſs. Captain Cook's ſecond voyage commenced in the year 1772, was undertaken with a particular view to the deciſion of the queſtion, concerning the exiſtence of a ſouthern Continent. In the proſecution of this voyage, and while he was proceeding ſouthward in queſt of a Continent, he fell in with ice iſlands, in S. lat. 50° 40′ and 2° of longitude from the Cape of Good Hope ; in his farther progreſs, he was ſtopped by other fields of ice, which led him to imagine, from a notion that theſe are formed in bays and rivers, that he could not be at a great diſtance from land. But having ſailed in S. lat. 55° 40′ for more than 30 leagues along the edge of the ice without finding any opening, he found that this ice did not join the land ; and therefore he thus diſcovered the fallacy of the general opinion, that ice is always formed in the vicinity of land. The obſervations of captain Cook confirmed thoſe of other navigators, that the cold of the ſouthern ſeas is much more intenſe than that of equal latitudes in the northern hemiſphere ; and he alſo aſcertained that this cold was not owing to the vicinity of a Continent, as had formerly been imagined. On the contrary, it was now determined beyond diſpute, that if any ſuch Continent exiſted in the eaſtern part of the ſouthern Ocean, it muſt be confined within the latitude of 60°. Having advanced as far as S. lat. 62° 10′ and W. long. 172°, he found the farther he proceeded that the number of ice iſlands very much increaſed ; and in lat. 67° 31′, and W. long. 142° 54′, he got into ſuch a cluſter of theſe iſlands, that it was both difficult and dangerous to eſcape them. Finding it impoſſible to get any farther to the ſouthward, he determined to explore a conſiderable tract of ſea to the north of his preſent ſituation, and then again to ſtand to the ſouth. But in this he was unſucceſsful ; no land being diſcovered either in ſailing northward, eaſtward, weſtward, or ſouthward ; though he proceeded in the laſt direction as far as 71° 10′ S. lat. and 106° 54′. W. long. It was now impoſſible to advance ; and it was the opinion of the captain himſelf, as well as of moſt of the gentlemen on board, that the ice by which they were now ſtopped extended as far as the pole. The moſt ſoutherly land diſcovered by this perſevering navigator was that on which he beſtowed the name of " Southern Thule," and which is ſituated in S. lat 59° 13′ 30″. W. long. 27° 45′. Here not a ſingle herb of any kind was ſeen, but very high and barren mountains, the tops of ſome of which reached above the clouds ; and we may obſerve, that this ſeems to be the only part of the world hitherto diſcovered, altogether unfit for the ſupport of animal life. This country was diſcovered on the 31ſt of January 1775. Upon the whole, it may be concluded, that the greateſt part of the ſouthern Continent, if it has any exiſtence, muſt be within the polar circle, where the ſea is ſo encumbered with ice, that the land muſt be inacceſſible. So great is the danger in navigating theſe ſouthern ſeas, that captain Cook aſſerts on the moſt probable grounds, that ſuch lands as lie to the ſouthward of his diſcoveries could not be explored ; and that even no man could venture farther than he had done. Thick fogs, ſnow-ſtorms, intenſe cold, and every attendant circumſtance that can render navigation difficult and dangerous, muſt be encountered ; and all theſe difficulties and dangers are heightened to a very great degree by the inexpreſſibly horrid aſpect of the country itſelf. It is a part of the world deemed by nature never to feel the warmth of the ſun's rays, but to be buried in everlaſting ſnow and ice. Whatever ports there may be in the coaſt, they are almoſt entirely covered with frozen ſnow of a vaſt thickneſs. If however any of them ſhould be ſo far open as to invite a ſhip into it, ſhe would run the riſk of being fixed there for ever, or of coming out on an ice iſland. Beſides, the iſlands and floats on the coaſt, the great falls from the ice-cliffs in the port, or a ſudden ſnow-ſtorm, might be attended with equally fatal effects. For theſe reaſons captain Cook determined to abandon the purſuit of a land, whoſe exiſtence was ſo equivocal, but whoſe inutility, if it could be diſcovered, was certain.

After captain Cook's perſevering and fruitleſs traverſes through every corner of the ſouthern hemiſphere, who, for the future, ſays the editor of Cook's third voyage (vol. i. Int. p. 56.), will pay any attention to the ingenious reveries of Campbell, de Broſſes, and de Buffon ? or hope to eſtabliſh an intercourſe with ſuch a continent as Maupertuis's fruitful imagination had pictured ? A Continent equal, at leaſt, in extent, to all the civilized countries in the known northern hemiſphere, where new men, new animals, new productions of every kind, might be brought forward to our view, and diſcoveries be made, which would open inexhauſtible treaſures of commerce. (See Maupertuis's Letter to the King of Pruſſia.) The author of the Preliminary Diſcourſe to Bougainville's " Voyage aux Iſles Malvaines" computes, that the ſouthern Continent (for the exiſtence of which, he owns, we muſt depend more on the conjectures of philoſophers, than on the teſtimony of voyagers) contains

8 or 10 millions of ſquare leagues! We can now boldly take it upon us to diſcourage all expeditions formed on ſuch reaſonings of ſpeculative philoſophers, into a quarter of the globe, where our perſevering Engliſh navigator, inſtead of this promiſed fairy land, found nothing but barren rocks, hardly affording ſhelter to penguins and ſeals; and dreary ſeas and mountains of ice, occupying the immenſe ſpace allotted to imaginary paradiſes, and the only treaſures there to be diſcovered, to reward the toil, and to compenſate the dangers of the unavailing ſearch.

CONTINGENCY, in *Metaphyſics*, denotes the mere poſſible exiſtence or non-exiſtence of an object in any future time; and is oppoſed to *neceſſity*; which ſee. See alſo CHANCE and PROBABILITY.

CONTINGENCY *of blood*, in the writers of the laws of Scotland, is uſed for proximity of blood. Bayne, Crim. Law. p. 48.

CONTINGENT, literally ſignifies what may or may not happen, what is caſual or uncertain, and depending upon chance. See CHANCE. But in military acceptation, it denotes the quota or proportion of troops, money, and ammunition, which each of a body of leagued or confederated ſovereigns, or princes, furniſhes on emergencies, when required or called on, in virtue of and in ſupport of the confederation. In the wars of the German empire, each prince and ſtate, and all the members of the Germanic body, were obliged to furniſh their contingent. In like manner the princes forming the *confederation of the Rhine*, are, at preſent, obliged to furniſh their reſpective contingents.

CONTINGENT *bill*, of a regiment, is an account of the extra charges, which a regiment, in the due courſe of ſervice, is from circumſtances unavoidably and accidentally under the neceſſity of incurring.

CONTINGENT *line*, or tangent-line, in *Dialling*, denotes the interſection of the planes of the dial and equinoctial, and it interſects the ſubſtile or ſubſtilar line at right angles.

CONTINGENT *legacy*, is a legacy depending on the life of the legatee; if it be left to any perſon, *when* or *if* he attains the age of twenty-one, and if he dies before that time, it is a lapſed legacy; but if it is left *to be paid* when he attains that age, it is a veſted legacy; and if the legatee dies, his repreſentatives ſhall receive it out of the teſtator's eſtate at the time, when it would have become payable, if the legatee had lived.

CONTINGENT, or *Executory remainder*, in *Law*, is where an eſtate is limited to take effect, either to a dubious and uncertain *perſon*, or upon a dubious and uncertain *event*; ſo that a particular eſtate, which doth ſupport a remainder, may or may not determine before the remainder may commence. This kind of remainder is oppoſed to *veſted* or *executed* remainders. 3 Rep. 20. See REMAINDER.

CONTINGENT *uſe*, in *Law*, is an uſe limited in a conveyance of land, which may, or may not, happen, to veſt, according to the *contingency* expreſſed in the limitation of ſuch uſe. An uſe in contingency is ſuch which by poſſibility may happen in poſſeſſion, reverſion, or remainder. 1 Rep. 121. See USE.

CONTINGENTS are ſometimes alſo uſed by mathematicians in the ſame ſenſe as tangents.

CONTINI, GIAMBATISTA, in *Biography*, an architect who enjoyed conſiderable reputation at Rome in the latter part of the 17th and the beginning of the 18th century. He was born in the year 1641, and after having acquired at the ſchools a competent knowledge of languages, the Belles Lettres, and geometry, was placed by his father, who was likewiſe an architect, under the tuition of the celebrated Bernini. The inſtructions of his maſter were not thrown away, and Giambatiſta became employed by ſeveral of the firſt families of Rome. He conſtructed many of thoſe magnificent altars and chapels with which the churches of Rome abound, and built the duomo of Vetralla as well as that of Vignarello. His works are enumerated by his biographer Lione Paſcoli, who informs us that he lived highly reſpected, and died in 1723. Paſcoli.

CONTINUAL CLAIM. See CLAIM *continual*.

CONTINUAL *proportionals*. When in a ſeries of quantities the firſt is to the ſecond as the ſecond to the third, and the third to the fourth, and the fourth to the fifth, &c. they are called *continual proportionals*: ſuch are 1, 2, 4, 8, 16, &c. where the terms increaſe in a two-fold ratio; and 36, 12, 4, $\frac{4}{3}$, &c. where they decreaſe in a triple ratio. Such a ſeries is otherwiſe called a *progreſſion*.

CONTINUANCE, in *Law*, is much the ſame as *prorogation* among the civilians. It denotes the continuing of a cauſe in court, by an entry upon the records there for that purpoſe. After iſſue or demurrer joined, as well as in ſome of the previous ſtages of proceeding, a day is continually given and entered upon the record, on which the parties are to appear, from time to time, as the exigency of the caſe may require. The giving of this day is called the "continuance," becauſe thereby the proceedings are continued without interruption from one adjournment to another. If theſe continuances are omitted, the cauſe is thereby diſcontinued, and the defendant is diſcharged *ſine die*, without a day, for this term: for by his appearance in court, he has obeyed the command of the king's writ; and, unleſs he be adjourned over to a day certain, he is no longer bound to attend upon that ſummons; but he muſt be warned afreſh; and the whole muſt begin *de novo*. It may ſometimes happen, that after the defendant has pleaded, nay, even after iſſue or demurrer joined, there may have ariſen ſome new matter, which it is proper for the defendant to plead; as, that the plaintiff, being a feme-ſole, is ſince married, or that ſhe has given the defendant a releaſe, and the like: here, if the defendant takes advantage of this new matter, as early as he poſſibly can, *viz.* at the day for his next appearance, he is permitted to plead it in what is called a plea *puis darrein-continuance*, or ſince the laſt adjournment. For it would be unjuſt to exclude him from the benefit of this new defence, which it was not in his power to make when he pleaded the former. But it is dangerous to rely on ſuch a plea, without due conſideration; for it confeſſes the matter which was before in diſpute between the parties (Cro. Eliz. 49.) And it is not allowed to be put in, if any continuance has intervened between the ariſing of this freſh matter and the pleading of it; for then the defendant is guilty of neglect, or *laches*, and is ſuppoſed to rely on the merits of his former plea. Alſo it is not allowed after a demurrer is determined, or verdict given; becauſe then relief may be had in another way, namely, by writ of *audita querela*. And theſe pleas *puis darrein continuance*, when brought to a demurrer in law or iſſue of fact, ſhall be determined in the ſame manner with other pleas. Blackſt. Comm. vol. iii.

Continuances and eſſoins are amendable upon the roll, at any time before judgment:—they are the acts of the court, and at common law they may amend their own acts before judgment, though in another term; but their judgments are only amendable in the ſame term in which they are given. (3 Lev. 431.) Upon an Original, one term, or two, or three terms may be meſne between the teſte and the return; and this ſhall be a good continuance; for the defendant is not prejudiced by it, and the plaintiff may give a day to the defendant beyond the common day, if he will. But a continuance by *capias* ought to be made from term to term, and there cannot be any meſne term, becauſe the defendant ought not to ſtay ſo long in priſon. (2 Danv. Abr. 150.) If a man recover upon demurrer, or by default, &c. and a writ of inquiry of damages is awarded, there ought to be continuance between the firſt and ſecond judgment, otherwiſe it will be a diſcontinuance; for the firſt is but an award, and not compleat, till the ſecond judgment, upon the return of the writ of inquiry of damages. (Ibid. 153). If the plaintiff be non-ſuited, by which the defendant is to recover coſts; if the plaintiff will not enter his continuances, on purpoſe to ſave the coſts, the defendant ſhall be ſuffered to enter them. (Cro. Jac. 316, 317.) The courſe of the court of King's Bench is to enter no continuance upon the roll, till after iſſue or demurrer, and then to enter the continuance of all upon the back, before judgment; and if it is not entered, it is error. (Trin. 16 Jac. B. R.) See Discontinuance.

Continuance *of a writ*, or *action*, is its holding in force from one term to another, in a caſe where the ſheriff has not returned, or executed, a former writ iſſued out in the ſame action.

Continuance *of aſſiſe*. If a record in the treaſury be alleged by one party, and denied by the other, certiorari ſhall be ſued to the treaſury and chamberlain of the exchequer; who, if they certify not that the ſaid record is there, or likely to be in the Tower; the king ſhall then ſend to the juſtices, repeating the certificate, and will them to *continue the aſſiſe*.

CONTINUANDA *aſſiſa*. See Assisa.

CONTINUANDO, in *Law*, a term uſed in a declaration of treſpaſs, where a plaintiff would recover damages for ſeveral treſpaſſes in the ſame action. To avoid multiplicity of ſuits, a man may in one action of treſpaſs recover damages for many treſpaſſes; laying the firſt to be done with a *continuance* to the whole time in which the reſt of the treſpaſſes were done; which is done in this form: *continuando tranſgreſſionem prædictam, &c. à prædicto die, &c. uſque, &c.* Terms de Ley. 2 Roll. Abr. 545. Lord Raym. 240. 7 Mod. 152.) This declaration of treſpaſs may be alleged, where the inquiry is continually renewed, as by ſpoiling or conſuming the herbage with the defendant's cattle; in which caſe the *continuando* is good. (1 Lill. Abr. 307.) Thus alſo treſpaſs for breaking a houſe with *continuando* is good; and until a re-entry is made, the continuation of the poſſeſſion is a continuing of the treſpaſs (Lutw. 1312.) But where the treſpaſs is by one or ſeveral acts, each of which terminates in itſelf, and being once done cannot be done again, it cannot be laid with a *continuando*; yet if there be repeated acts of treſpaſs committed, (as cutting down a certain number of trees,) they may be laid to be done, not continually, but at divers times and days within a given period. Salk. 638, 639. Lord Raym. 823.

Continuando *Proceſſum*. See Processum and Continuance.

CONTINUANS Punctum. See Punctum.

CONTINUATION *of* Motion. See Motion and Projectile.

CONTINUATIVE Conjunctives, in *Grammar*, are thoſe conjunctions, uniting both ſentences and their meaning, which join thoſe ſentences only, which have a natural connection; in contradiſtinction to copulative, which join all ſentences, however incongruous in ſignification. The latter merely couple ſentences, and are applicable to all ſubjects, whoſe natures are not incongruous. The former, on the contrary, by more intimate connection, conſolidate ſentences into one continuous whole, and are therefore applicable only to ſubjects which have no eſſential coincidence. The principal copulative in Engliſh, is, *and*; the continuatives are, *if*, *becauſe*, *therefore*, *that*, &c. *E. G.* "Lyſippus was a ſtatuary, *and* Priſcian was a grammarian."—"The ſun ſhineth, *becauſe* the ſky is clear." Continuatives, according to the diſtribution of Mr. Harris (Hermes, p. 244.) are either ſuppoſitive, as, *if*; or poſitive, as, *becauſe*, *therefore*, &c. *E. G.* "You will live happily, *if* you live honeſtly."—"You will live happily, *becauſe* you live honeſtly." The difference between theſe continuatives is this; the ſuppoſitives denote connection, without aſſerting actual exiſtence; and the poſitives imply both the one and the other. Moreover, poſitives are either caſual, as, *becauſe*, *ſince*, *as*, &c.; or collective, as *therefore*, *then*, &c.; and they differ in this reſpect, that the cauſals ſubjoin cauſes to effects, thus; "the ſun is eclipſed, *becauſe* the moon intervenes;" but the collectives ſubjoin effects to cauſes, thus; "the moon intervenes, *therefore* the ſun is eclipſed." All theſe continuatives may be reſolved into copulatives. Inſtead of "*becauſe* it is day, it is light," we may ſay, "it is day, *and* it is light."

CONTINUATO, in the *Italian Muſic*, is uſed to direct a ſinger, or player, to continue or hold on a ſound, in equal ſtrength or manner; or to continue a movement in an equal degree of time all the way.

CONTINUED Fever. A fever without remiſſions or intermiſſions. See Fever.

Continued *Quantity*. } See Continuum, Continuity,
Continued *Body*, &c. } and Quantity.

Continued, or *thorough baſs*, in *Muſic*, is that which continues to play conſtantly, both during the recitatives, and to ſuſtain the choir, or chorus.

Continued *proportion*, in *Arithmetic*, is that in which the conſequent of the firſt ratio is the ſame with the antecedent of the ſecond: as, 3 : 6 :: 6 : 12. See Proportion.

On the contrary, if the conſequent of the firſt ratio be different from the antecedent of the ſecond, the proportion is ſaid to be *diſcrete*: as, 3 : 6 :: 4 : 8. See Discrete.

Continued *zocle*, or *ſocle*, in *Architecture*. See Socle.

Continued *Attic*, *Community*, *Pedeſtal*. See the ſubſtantives.

CONTINUI Solutio. See Solutio.

CONTINUITY is uſually defined among *Schoolmen*, the immediate coheſion of parts in the ſame *quantum*. Others define it, a mode of body, whereby its extremes become one: and others, a ſtate of body reſulting from the mutual implication of its parts.

Continuation relates to *duration*, and continuity to *extenſion*. We ſay, the *continuation* of a work, or an action; and the *continuity* of ſpace or ſize; *continuation* of the ſame conduct; and *continuity* of the ſame building.

There are two kinds of continuity, *mathematical* and *phyſical*. The firſt is merely imaginary and fictitious; ſince it ſuppoſes real or phyſical parts where there are none. *Phyſical* continuity is, ſtrictly, that ſtate of two or more parts, or particles, wherein they appear to adhere, or conſtitute one uninterrupted quantity, or *continuum*; or between which we perceive no intermediate ſpace.

The ſchoolmen diſtinguiſh two other ſorts of continuity; viz. *homogeneous*, and *heterogeneous*. The firſt, where our ſenſes do not perceive the bounds, or extremes, of the parts; and this agrees even to air, water, &c. The ſecond, where our ſenſes indeed perceive the extremes of certain parts, yet at the ſame time obſerve the ſame parts cloſely linked to each other; either in virtue of their ſituation or figure, &c.

and this is chiefly attributed to the bodies of animals and plants.

The continuity of bodies is a ſtate merely relative to our ſight and touch: *e. gr.* if the diſtance of two ſeparate objects be ſuch, as that the viſual angle they ſubtend is inſenſible to the eye, which it will be if leſs than ſixteen ſeconds, the two ſeparate bodies will then appear *contiguous.* Now, the reſult of ſeveral *contiguous* objects, is a *continuity:* ſo that any number of viſible objects, being placed ſo as that the diſtances ſubtend angles of leſs than ſixteen ſeconds, they will appear to form one *continuum.*

And hence, as we can determine the diſtance at which any given magnitude becomes inviſible; it is eaſy to find at what diſtance any two bodies, however remote from each other, will appear as contiguous; and ſeveral, as forming one *continuum.* For the phyſical cauſe of continuity, ſee Coheſion.

Leibnitz, an eminent mathematician, has ſuppoſed what he calls a law of continuity to obtain in the univerſe, by which law every thing that is executed or done in nature, is done by infinitely ſmall degrees. He urges, that good ſenſe dictates this truth, *natura non operatur per ſaltum,* or that nothing can paſs from one extreme to another, without paſſing through all the intermediate degrees. Bernouilli Opera, tom. iii. p. 9. *ſeq.*

This law ſeems ſubject to difficulties: rigorouſly taken, it ſuppoſes actual, and yet infinitely ſmall changes, which ſome philoſophers cannot reliſh; and if we ſuppoſe changes only imperceptible to our ſenſes, but finite, the law of continuity is no leſs violated, than if the univerſe were to be ſuddenly deſtroyed, as M. Maupertuis juſtly obſerves. Mem. de l'Acad. de Berlin. tom. ii. p. 284.

This law of continuity led Mr. Bernouilli to reject all hard bodies as chimeras, and naturally impoſſible.

CONTINUO, in the *Italian Muſic,* is ſometimes applied to *baſſo,* to ſignify the thorough-baſs. That *baſſo continuo,* is the continual, or thorough-baſs. It is ſometimes marked in muſic books by the letters B, C.

Continuo is alſo uſed for a ſpecies of harmony mentioned by Julius Pollux, and which, ſays Zarlino, anſwers to the perpetual burden of our bag-pipes, which now and then muſt be harmonious.

CONTINUOUS Fevers. See Continued *fever.*

CONTINUUM, or Continued *quantity,* in *Phyſics,* denotes a quantity, or co-extenſion, whoſe parts are not divided, but joined and connected together, ſo as to leave no room to determine where one begins, and another ends.

It is controverted, among philoſophers, whether a *continuum* be infinitely diviſible, *i. e.* diviſible into infinite proportionable parts?

The ancients attributed the riſe of water, in pumps, to the love of continuity, and the abhorrence of a vacuum; becauſe the weight and preſſure of the air were not then known.

Mathematicians divide quantity into *continued* and *diſcrete.* The former being that which is expreſſed by lines, and makes the ſubject of geometry; and the latter comprehending thoſe that are expreſſed by numbers, which make the ſubject of arithmetic.

In medicine and chirurgery, wounds, ulcers, fractures, &c. are expreſſed by the phraſe *ſolutio continui,* or *ſolution of continuity.*

In a critical ſenſe, we ſay, there ought to be a continuity, *i. e.* a connexion between the parts of a diſcourſe.

In the epic poem, particularly, the action ſhould have a continuity in the narration, though the events, or incidents, be not continued. As ſoon as ever the poet has opened his ſubject, and brought his perſons on the ſtage, the action is to be continued to the end; every character muſt be at work, and no ſuch thing as an idle perſon to be ſeen.

F. Boſſu obſerves, that, by retrenching dull languiſhing incidents, and intervals void of action, which break the continuity, the poem acquires a continued force, which makes it run equally throughout.

CONTOBABDITES, a ſect in the ſixth century. Their firſt leader was Severus of Antioch, who was ſucceeded by John the grammarian, ſurnamed Philoponus, and one Theodoſius; whoſe followers were alſo called Theodoſians.

Some of them who were willing to receive a book compoſed by Theodoſius on the Trinity, made a ſeparate body, and were called *Contobabdites,* from a place not known, which Nicephorus does not mention, but which muſt apparently have been the place where they held their aſſemblies.

The Contobabdites allowed of no biſhops; which is the only circumſtance tranſmitted to us concerning them.

CONTOOCOOK, in *Geography,* a river of the United States of America, in New Hampſhire, which runs into the Merrimack, four miles N. of Concord.

CONTOPÆCTÆ, of κοντος, *pole,* and πηκτος, *compaſt,* in *Antiquity,* a ſort of artiſts who ſupported a pole on their foreheads ſo firmly, that boys could play, dance, and wreſtle together on it.

CONTOR, or Cuntore, in *Ornithology.* See Condore.

CONTORSION, in *Surgery,* a twiſting or deformity of ſome part of the body; ariſing generally from a diſeaſed ſtructure of the bones, or an irregular action of the muſcles. Thus a contorſion of the back may be occaſioned by a caries, or a rickety diſpoſition in the vertebræ; and a contorſion, or twiſting of the head, ſo that the chin ſhall be turned towards one ſhoulder, may ariſe from a paralyſis, or a ſpaſmodic ſtate of the ſterno-maſtoid muſcle. But the nature of this diſeaſe is more particularly deſcribed under the article Distortion, to which the reader is referred.

CONTORTÆ, or Contorti, in *Botany,* the twenty-ninth natural order in the Philoſophia Botanica of Linnæus, and the thirtieth of the Prelections. In the Philoſophia Botanica, it conſiſts of the following genera: rauwolfia, tevetia, cerbera, plumiera, tabernæmontana, cameraria, periploca, nerium, vinca, apocynum, cynanchum, ceropegia, aſclepias, ſtapelia. In the ſynoptic table, annexed to the Prelections, they ſtand thus: I. Pericarp a follicle; tabernæmontana; cameraria; plumeria; echites; nerium; ceropegia; vinca; apocynum; aſclepias; cynanchum; periploca; *pergularia;* ſtapelia; *embothrium, *Forſt.* *rhopala, *Aubl.*; *plectronia? allamanda.* II. Pericarp a capſule; macrocnemum; *manettia;* cinchona, removed from cymoſæ; *portlandia; rondeletia; hilliæ; genipa.* III. Pericarp a berry; *gardenia; muſſænda; randia;* * fagræa, *Thunb.; cariſſa; pæderia; arduina;* lycium and ceſtrum, both removed from vepoeculæ; *gynopogon, *Forſt.*: *willughbeja. *Schreb.;* melodinus, *Linn. jun.* IV. Pericarp a drupe; rauwolfia; cerbera. Thoſe printed in italics were added by Linnæus himſelf; thoſe marked with an aſteriſk, by Giſeke from other authors. The order was named by Linnæus, from the form of the corolla, which is twiſted in a direction contrary to the ſun: its border, when open, reſembles a wheel, each ſegment having generally unequal ſides, with the ſhorter ſide placed under the longer ſide of the preceding one. Only three of the genera are natives of Europe, aſclepias, vinca, and cynanchum: moſt of them are lacteſcent and poiſonous;

ſome highly deleterious. *Root* perennial. *Leaves* undivided, generally oppoſite, ſometimes three or four together, rarely alternate. *Inflorescence* often ſingular, the peduncle ariſing from the ſide of the ſtem betwixt the pairs of leaves, not from their axils. *Calyx* one-leafed, five-cleft. *Corolla* regular, monopetalous, five-cleft: ſtructure of the nectaries in moſt genera very ſingular. *Stamens* five. *Piſtils* two, or one with a double ſtigma. Germ generally ſuperior.

CONTOUR, in *Painting* or *Drawing*, a French word, ſynonymous with contorno in the Italian, and outline in the Engliſh language. Perfection of outline conſtitutes, perhaps, the greateſt difficulty in painting; although it is, properly ſpeaking, only *one* of the requiſites of deſign; yet the knowledge of it ſeems neceſſarily to pre-ſuppoſe a thorough acquaintance with all the remainder; and hence the adage of Annibale Caracci, not very delicately expreſſed in the Italian, "Give me but a correct outline, and fill it up as you pleaſe!" See DESIGN.

CONTOUR, alſo denotes the compaſs, limits, or enceinte of a country, place, camp, plan, deſign, &c. It is the ground work of each of theſe things.

CONTOURNE', a French term applied to any animal that is ſtanding or paſſing with its face towards the ſiniſter ſide of the eſcutcheon. In Engliſh heraldry it is termed *counter paſſant*,

CONTOURNIATED, or CONTORNIATED, a term applied among *Antiquaries* to a ſpecies of medals, ſo called from the Italian *contorniato*, encircled, on account of the hollow circle which commonly runs round them. They are diſtinguiſhed from medallions, as they are ſometimes denominated, not by their ſize, but by their thinneſs; faint relief; reverſes ſometimes in *intaglio*, hollowed, not raiſed; and, in general, by their peculiar and inferior workmanſhip. Medallic writers have formed various opinions concerning theſe ſingular pieces of coinage. Some ſuppoſe that they were ſtruck by Gallienus, to the memory of illuſtrious men, and celebrated athletæ, at the time when he cauſed all the conſecration-coins of his predeceſſors to be reſtored. This ſentiment ſeems nearly to have been adopted by M. Mahudel, who ſays, (Hiſt. de l'Acad. des Belles Lettres, tom. v. p. 284.) that the contorniati were ſtruck originally at Rome, about the cloſe of the third century. F. Hardouin conjectures, that they were not earlier than the 13th century; other antiquaries refer them to the fifth century; and others find inſtances of them as ancient as the time of Nero; others again aſcribe the invention of them to Greece, in her days of glory, and they ſuppoſe that they were appropriated to the purpoſe of honouring the memories of great men, and principally of thoſe who had borne away the prize at the ſolemn games; ſuch are thoſe which bear the names or images of Homer, Solon, Euclid, Pythagoras, Socrates, Apollonius Tyanæus, and ſeveral Athletæ, whoſe victories are expreſſed upon them by palms, and chariots, either bigæ or quadrigæ. Havercamp, in an expreſs work on theſe pieces, thinks they were ſtruck from the times of Conſtantine I. to thoſe of Valentinian III. on account of the public games. Mr. Pinkerton (Eſſ. on Medals, vol. i. p. 232.) ſuggeſts, that they were tickets for different places in the public games. The dye, appearance, device, inſcription of the reverſe—every thing—confirmed this opinion; which he has found perfectly conſonant to that of two or three of the firſt medalliſts in this country. This opinion is ſo far conformable to that of Havercamp, and others, as it ſuppoſes that theſe pieces were ſtruck upon occaſion of the games. But it differs in repreſenting theſe medals, as mere tickets for places at the games; and ſtill more in ſuppoſing them ſtruck in all ages of the empire, from Auguſtus, downwards. Thoſe who ſuppoſe them ſtruck in the lower empire, are reduced to the deplorable dilemma of imagining, that Chriſtian princes thought Nero's head an honour to their games; and that they preſerved the portrait of Apollonius Tyanæus, the enemy of their faith, and thoſe of other Pagan philoſophers. Joubert indeed aſcribes them to the upper empire, without determining whether they were ſtruck under one prince, or all who gave games. Mr. Pinkerton is convinced, that they were ſtruck under the various emperors whoſe names they bear; and that when Conſtantine I. introduced Chriſtianity, they would almoſt vaniſh, inſtead of beginning, according to the opinion of Havercamp. The difference of workmanſhip, in theſe pieces, if accurately inſpected, may ſhew this of itſelf, independently of other reaſons. Although theſe pieces are of different kinds, they are moſtly of a ſize between two and three inches in diameter. Some have, upon the obverſe part, the head of the emperor or empreſs, who gave the games; and almoſt a ſeries of them might be formed from Auguſtus down to Gallienus. In confirmation of this opinion, it is further alleged, that thoſe emperors, who were remarkably diſtinguiſhed by their attachment to public diverſions, occur very frequently on theſe pieces, which Mr. Pinkerton calls "ticket-medals," whereas others appear more ſeldom, and thoſe who never preſented any games, not at all. Thoſe with Nero on their obverſes are ſo common as to be of very little value. Other obverſes preſerve the portraits of illuſtrious authors of antiquity, that are no where elſe to be found. Salluſt, Horace, and other Roman writers, were delineated on theſe tickets, when the memory of their perſons was yet freſh to the inhabitants of Rome, and we may therefore depend upon their portraits. This cannot be ſaid of the Greek portraits of Homer, Solon, Pythagoras, Socrates, and others, all which our author ſuppoſes to have been ſtruck at Rome, when Grecian actors were to perform, or in the Grecian cities, during the Roman empire. A few obverſes preſent athletæ, or actors in the games, and ſuch are commonly repreſented holding a horſe by the rein, or in ſome other attitude peculiar to their profeſſion. On the reverſes there is almoſt always a charioteer driving a chariot, or ſome ſimilar device, peculiar to public games. Thoſe ſtruck for the theatre are the moſt ſcarce, and have ſometimes on the reverſe an actor at full length, with "PLACEAS," *mayeſt thou pleaſe*, or ſome ſuch legend. One, in particular, has a buſt of Salluſt on the obverſe; and on the other ſide three perſons, one of whom bears an inſtrument, reſembling the common flute; another an inſtrument like the ſcenic flute ſeen in the hands of Pan; while the third is declaiming. The legend is "PETRONI PLACEAS," *mayeſt thou pleaſe, Petronius*. The perſon declaiming is Petronius, who was, perhaps, that day, to make his firſt appearance upon the Roman ſtage; and the whole deſign, in this laſt inſtance, is ſo clear, that Mr. Pinkerton cannot forbear being ſurpriſed, that the intention of theſe tickets ſhould ſo long have eſcaped the medallic authors. The ſuppoſition that they were tickets for different ſeats, or places, at the games, is further confirmed by the variety of marks to be found on the obverſes of them. Some have a ſprig of laurel; others a P, with an E below it, implying, perhaps, "podium equeſtre," or the box of the equeſtrian order, which laſt is very common; others bear a particular animal, or ſome ſuch badge. All theſe marks, in tickets perfectly preſerved, are cut in the braſs, and then filled up with ſilver. The pieces of this claſs, with imperial portraits, are of little value; thoſe bearing the images of illuſtrious men, are eſtimable, though not of great price. Apollonius Tyanæus, who flouriſhed in the reign of Domitian, and Apuleius, who lived in that of Antoninus the philoſopher, are, it is believed, the lateſt of that deſcription who appear upon theſe ticket-medals.

CONTRA, or COUNTER, in *Compoſition.* See COUNTER.

CONTRA, *Lat.* a prepoſition frequently uſed by the Italians in their *Muſic*: *contrappunto*, counterpoint; *contra baſſo*, double baſe; *contralto*, counter tenor; *contrappunto doppia*, double counterpoint; *contrappunto ſemplia*, ſimple counterpoint; *contrappunto fiorito*, florid counterpoint, &c. This Latin word, which the Italians have adopted, was originally applied to all the ſeveral parts deſtined to make harmony to a plain ſong or melody, as counterpoints or counterparts to the canto fermo. Thus, harmony in four and more parts was formed: as *baſſo*, baſe; *medius*, mean or middle part; *alto tenore*, high tenor, from the ſituation of the clef on the ſtaff; the *diſcantus*, *ſoprano*, *triplum*, or treble. When the alto tenore ſung the part oppoſite or *againſt* the treble, it was called *contralto* or *counter tenor*; and when a lower part was employed than the baſe, it was called *contra baſſo*: the title now given to a double baſe.

CONTRA, in *Surgery*. See COUNTER-*fiſſure*, COUNTER-*extenſion*, COUNTER-*opening*, COUNTER-*ſtroke*, &c.

CONTRA *battuta*, in *Muſic*, againſt, or out of time.

CONTRA *formam collationis*, in *Law*, a writ that lay where a man had given lands, in perpetual alms, to a religious houſe, hoſpital, ſchool, or the like, and the governor, or managers, had alienated the lands, contrary to the intention of the donor, for the recovery of them. Reg. Orig. 258.

This was founded on the ſtatute of Weſtm. 2. cap. 1.

CONTRA *formam feoffamenti*, a writ that lay for the heir of a tenant, infeoffed of lands or tenements by the lord's charter, to make certain ſuit and ſervice to his court; who was afterwards diſtrained for more ſervices than were contained in the charter. Reg. Orig. 176. Old Nat. B. ii. 162.

CONTRA *formam ſtatuti*, is the uſual concluſion of every indictment, &c. laid on an offence created by ſtatute.

If one ſtatute be relative to another, as where the former makes the offence, and the latter adds a penalty, the indictment ought to conclude *contra formam ſtatutorum.* 2 Hale's Pl. C. 173. c. 24. Where there are ſeveral ſtatutes, and it does not appear on which the information is founded, the concluſion, "contra formam ſtatuti" is ill. Cro. Jac. 142. Pl. 19. Broughton *v.* Moor, &c.

CONTRABAND, in *Commerce*, a prohibited commodity; or a merchandize bought or ſold, imported or exported, in prejudice, and contrary to the laws and ordinances of a ſtate, or the public prohibitions of the ſovereign.

The word comes from the Italian *contrabando*, of *contra* and *bando*, q. d. contrary to edict, or publication of prohibition.

Contraband goods are not only liable to confiſcation themſelves, but do alſo ſubject all other allowed merchandizes found with them in the ſame box, parcel, or bale, together with the horſes, waggons, &c. which conduct them to the ſame.

In England there are two principal contrabands for exportation, wools and live ſheep, which all ſtrangers are prohibited from carrying out, on pain of having the right hand cut off; the other, that of ſheep-ſkins and calf-ſkins, which all foreigners are in like manner prohibited from exporting, on pain alſo of having the right hand cut off; yet the ſubjects of England are allowed to tranſport the ſame from France to England. See WOOL and SHEEP.

Since the year 1662, when liſts were formed of contraband goods, as to the import, and which included more than fifty different ſorts, many regulations and ſtatutes have been enacted; and theſe are ſo numerous and various, and ſo liable to change in the fluctuating ſtate of commerce, that in a work of this kind it would be of little permanent utility to recite them.

In 1719 and 1720, an attempt was made in parliament to paſs a bill for putting gold and ſilver, whether in coined ſpecies, or otherwiſe, among the number of contraband goods for exportation; but in vain, by reaſon of the ſtrong oppoſition made by thoſe who enrich themſelves by the export of theſe metals; which, by the laws of the kingdom, are allowed to be ſent away, upon entering them, paying the duty of the export, and making oath of their being foreign, *i. e.* of their not being the coin or plate of the kingdom, melted down. See CUSTOMS.

CONTRACT, a mutual conſent of two or more parties, who promiſe and oblige themſelves voluntarily, to do ſomething, pay a certain ſum, or the like.

As a contract is a mutual promiſe, the obligation of contracts, the ſenſe in which they are to be interpreted, and the caſes where they are not binding, will be the ſame as of promiſes. See PROMISE. From the principle on which the obligation of promiſes is founded, *viz* "that this obligation is to be meaſured by the expectation which the promiſer any how voluntarily and knowingly excites," reſults a rule, which governs the conſtruction of all contracts, and is capable, from its ſimplicity, of being applied with great eaſe and certainty: the rule is, that "whatever is expected by one ſide, and known to be ſo expected by the other, is to be deemed a part or condition of the contract." The ſeveral kinds of contracts may be comprehended under thoſe of ſale, hazard, loan of inconſumable property and of money, and labour, including ſervice, commiſſions, partnerſhip, and offices. With regard to contracts of ſale, the rule of juſtice, which ought principally to be inculcated in the making of bargains, is, that the ſeller is bound in conſcience to diſcloſe the faults of what he offers to ſale. If it be deemed diſhoneſt to magnify beyond the truth the good qualities of the commodity which we have to ſell, is it leſs unjuſt to conceal its faults? The buyer in many caſes has no ſecurity from impoſition, but in the ingenuouſneſs and integrity of the ſeller. This rule, however, admits of one exception, namely, where the ſilence of the ſeller implies ſome fault in the thing to be ſold, and where the buyer has a compenſation in the price for the riſk which he runs: as where a horſe, in a London repoſitory, is ſold by public auction, without warranty; the want of warranty is notice of ſome unſoundneſs, and produces a proportionable abatement in the price. (See WARRANTY.) To this head of concealing the faults of the article which we want to diſpoſe of may be referred the practice of paſſing bad money. This practice has been ſometimes defended by a vulgar excuſe, that we have taken the money for good, and muſt therefore get rid of it: that is, in other words, we have been deceived or impoſed upon, and therefore we may deceive or impoſe upon others. This excuſe is much the ſame, as if one, who had been robbed upon the highway, ſhould allege that he had a right to re-imburſe himſelf out of the pocket of the firſt traveller he met: the juſtice of which reaſoning the traveller poſſibly may not comprehend. (See UTTERING *of falſe money*.) Where no monopoly or combination exiſts, the market price is always a fair price; becauſe it will always be proportionable to the uſe and ſcarcity of the article. Innumerable queſtions relating to this kind of contract are determined ſolely by *cuſtom*; not, indeed, that cuſtom poſſeſſes any proper authority to alter or aſcertain the nature of right and wrong; but becauſe the contracting parties are preſumed to include, in their ſtipulation, all the conditions which cuſtom has annexed to contracts of the ſame ſort: and when the uſage is notorious, and no exception made to it, this preſumption is generally agreeable to the fact. Thus, in juſtice as well as in law, what is called "the cuſtom of merchants" regulates the conſtruction of mercantile concerns.

By contracts of hazard are meant *gaming* and *inſurance.* See theſe articles.

Contracts of loan comprehend thoſe pertaining to inconſumable property, and to money. When the identical loan is to be returned, as a book, a horſe, &c. it is called "inconſumable," in oppoſition to corn, wine, money, and thoſe things which periſh, or are parted with in the uſe, and can therefore only be reſtored in kind. The queſtions pertaining to this claſs of contracts are few and ſimple, and admit of an eaſy and obvious ſolution. If the thing lent be loſt, or damaged by the uſe, or by accident in the uſe for which it was lent, the lender ought to bear the loſs or damage. With regard to the loan of money, there exiſts no reaſon in the law of nature, why a man ſhould not be paid for the uſe of his money lent, as well as of any other property into which the money might be converted. (See INTEREST and USURY.) For contracts of labour, ſee SERVANT, COMMISSION, AGENT, FACTOR, STEWARD, ATTORNEY, and ADVOCATE. See alſo PARTNERSHIP. Under this head it may be obſerved, that in many offices, as ſchools, fellowſhips of colleges, profeſſorſhips of the univerſities, and the like, there is a two-fold contract; one with the founder, and the other with the electors. The contract with the founder obliges the incumbent of the office to diſcharge every duty appointed by the charter, ſtatutes, deed of gift, or will of the founder; becauſe the endowment was given, and conſequently accepted, for that purpoſe, and upon thoſe conditions. The contract with the electors extends this obligation to all duties that have been *cuſtomarily* connected with, and reckoned a part of, the office, though not preſcribed by the founder; for the electors expect from the perſon they chuſe all the duties which his predeceſſors have diſcharged; and as the perſon elected cannot be ignorant of their expectation, if he mean to refuſe this condition, he ought to appriſe them of his objection. Here it ſhould be obſerved, that the electors can excuſe the conſcience of the perſon elected from this claſs of duties only; becauſe this claſs reſults from a contract, to which the electors and the perſon elected are the only parties. The other claſs of duties reſults from a different contract; and with reſpect to theſe a queſtion ariſes of delicate inveſtigation, and of difficult ſolution, *viz.* how far the incumbent of an office may be allowed to deviate from the will of the founder, and to ſuppoſe him placed in circumſtances ſimilar to his own, and, in this new ſtate of things, capable of forming a different judgment, and equally diſpoſed to adapt his regulations and injunctions to the change of circumſtances, which, in the courſe of ages, has occurred?—The beſt mode of eaſing the conſciences of incumbents, in caſes of this kind, is to introduce a reformation in many antiquated eſtabliſhments, and in the laws, already obſolete, and, as it were, quieſcent, by which they were deſigned by their unenlightened, but liberally diſpoſed, founders to be regulated. Few of theſe contracts, to which we now refer, have, we conceive, been liberally and punctually fulfilled in modern times; and it would be unqueſtionably more conducive to the honour and uſefulneſs of ancient inſtitutions, and of official incumbents, to aboliſh regulations, which it is not thought proper to obſerve. It has been a queſtion of ſome magnitude and difficulty, what offices may be conſcientiouſly ſupplied by a deputy. A deputy, according to archdeacon Paley, may be allowed in all caſes, to which the following objections do not apply: 1. Where a particular confidence is repoſed in the judgment and contract of the perſon appointed to it; as the office of a ſteward, guardian, judge, commander in chief by land or ſea. 2. Where the cuſtom hinders; as in the caſe of ſchoolmaſters, tutors, and of commiſſioners in the army or navy. 3. Where the duty cannot, from its nature, be ſo well performed by a deputy; as the deputy-governor of a province may not poſſeſs the legal authority, or the actual influence of his principal. 4. When ſome inconvenience would reſult to the ſervice in general from the permiſſion of deputies in ſuch caſes; *e. g.* it is probable that military merit would be much diſcouraged, if the duties belonging to commiſſions in the army were generally allowed to be executed by ſubſtitutes. In this connection, the non-reſidence of the parochial clergy, who ſupply the duty of their benefices by curates, preſents itſelf to conſideration; but as it will require a more diſtinct diſcuſſion, we refer to the article NON-RESIDENCE. On the ſubject of this article, ſee Paley's Principles of Moral and Political Philoſophy, vol. i. p. 142—163.

CONTRACT is particularly uſed in *Common Law*, for an agreement or covenant between two or more perſons, with a lawful conſideration or cauſe. As, if I ſell my horſe for money; or covenant in conſideration of 20*l.* to make you a leaſe of a farm; theſe are good contracts, becauſe there is *quid pro quo*, or one thing for another. Or, a contract, which uſually conveys an intereſt merely in action, may be thus defined: "An agreement upon ſufficient conſideration, to do or not to do a particular thing." In all contracts, therefore, our attention is directed to three points, *viz.* the agreement, the conſideration, and the thing to be done or omitted, or the different ſpecies of contracts. In a contract, conſidered as an agreement, a mutual bargain, or convention, there muſt be at leaſt two contracting parties, of ſufficient abilities to make a contract, as where A. contracts with B. to pay him 100*l.*, and thereby transfers a property in ſuch ſum to B. This property, however, is not in poſſeſſion, but in action merely, and recoverable by ſuit at law; ſo that it could not be transferred to another perſon by the ſtrict rules of the ancient common law, for no choſe in action could be aſſigned or granted over. See CHOSE *in action.*

This contract or agreement may be either *expreſs* or *implied.* *Expreſs* contracts are where the terms of the agreement are openly uttered and avowed at the time of the making, as to deliver an ox, or ten load of timber, or to pay a ſtated price for certain goods. *Implied* are ſuch as reaſon and juſtice dictate, and which, therefore, the law preſumes that every man undertakes to perform. There is one ſpecies of implied contract, which runs through and is annexed to all other contracts, conditions, and covenants, *viz.* that if I fail in my part of the agreement, I ſhall pay the other party ſuch damages as he has ſuſtained by ſuch my neglect or refuſal. In ſhort, almoſt all the rights of perſonal property (when not in actual poſſeſſion), do in great meaſure depend upon contracts of one kind or other, or at leaſt might be reduced under ſome of them; and this is the method taken by the civil law, which has referred the greateſt part of the duties and rights, of which it treats, to the head of obligations *ex contractu*, and *quaſi ex contractu.* (Inſt. 3. 14. 2.) See ASSUMPSIT.

A contract may alſo be either *executed,* as if A. agree to change horſes with B., and they do it immediately; in which caſe the poſſeſſion and the right are transferred together:—or it may be *executory*, as if they agree to change next week; in which caſe the right only veſts, and their reciprocal property in each other's horſe is not in poſſeſſion but in action:—for a contract *executed* (which differs nothing from a grant) conveys a *choſe in poſſeſſion*; a contract *executory* conveys only a *choſe in action*. For an account of the *conſideration*, upon which a contract is founded, ſee Consideration.

A conſideration of ſome ſort or other is ſo abſolutely neceſſary to the forming of a contract, that a *nudum pactum*, or agreement to do or pay any thing on one ſide, without any compenſation on the other, is totally void in law, and a man cannot be compelled to perform it. However a man may or may not be bound to perform ſuch a contract, in honour or conſcience, which the municipal laws do not decide, it is certain that theſe laws will not compel the execution of what he has no viſible inducement to engage for:—and, therefore, our law has adopted the maxim of the civil law, that *ex nudo pacto non oritur actio*. (Cod. 2. 3. 10. & 5. 14. 1. Br. & St. d. 2. c. 24. Bro. Abr. tit. de te, 79. Salk. 129.) But any degree of reciprocity will prevent the pact from being nude; nay, even if the thing be founded in a prior moral obligation, (as a promiſe to pay a juſt debt, though barred by the ſtatute of limitations,) it is no longer *nudum pactum*. And as this rule was principally eſtabliſhed to avoid the inconvenience that would ariſe from ſetting up mere verbal promiſes, for which no good reaſon could be aſſigned (Plowd. 308, 309.), it therefore does not hold in ſome caſes, where ſuch promiſe is authentically proved by written documents. For if a man enters into a voluntary bond, or gives a promiſſory note, he ſhall not be allowed to aver the want of a conſideration in order to evade the payment; for every bond, from the ſolemnity of the inſtrument (Hardr. 200. 1. Ch. Rep. 157.), and every note from the ſubſcription of the drawer (Lord Raym. 760.), carries with it an internal evidence of a good conſideration. Courts of juſtice will, therefore, ſupport them both, as againſt the contractor himſelf; but not to the prejudice of creditors, or ſtrangers to the contract.

The moſt uſual contracts, by which the rights of chattels perſonal may be acquired by the laws of England, are thoſe of *ſale* or *exchange*, of *bailment*, of *hiring* and *borrowing*, and of *debt*. See theſe articles reſpectively. See alſo Interest and Usury, Bottomry and Respondentia, Insurance, and Annuity.

Every contract, whatever be its nature, implies in itſelf an *aſſumpſit* in law, for the performance of it; for a contract would be to no purpoſe, if there were no means to enforce its performance. See Assumpsit.

A diverſity occurs where a day of payment is limited in a contract, and where it is not ſo limited. In the former caſe, the contract is good preſently, and an action lies upon it, without payment; but in the latter, it is otherwiſe. Thus, if a man buy any commodity, the contract is void, if he do not pay the money preſently; but if a day of payment be ſtipulated, there the one may have an action for the money, and the other trover for the commodity. (Dyer, 30. 293.) Where a ſeller ſays to a buyer, he will ſell his horſe for a ſpecified ſum, and the buyer ſays he will give it; if he preſently tell out the money, it is a contract; but if he do not, it is no contract. (Noy's Max. 87. Hob. 41.) The property of any thing ſold is immediately in the buyer by the contract; though regularly it muſt be delivered to the buyer, before the ſeller can bring his action for the money. (Noy, 88.) If a perſon contract to buy a horſe, or any thing elſe, of another, and no money is paid, or earneſt given, nor day ſet for payment, nor the thing delivered,; in theſe caſes, no action will lie for the money, or the thing ſold, but it may be ſold to another. (Plowd. 128. 309.) All contracts are to be certain and complete. For an agreement to give ſo much for a thing as it ſhould be reaſonably worth, is void on account of its uncertainty: ſo is alſo a promiſe to pay money in a ſhort time, &c. or to give ſo much, if a perſon likes the thing when he ſees it. (Dyer, 91. 1 Bulſt. 92.) But if I contract to give another 10*l.* for ſuch a thing, if I like it on ſeeing the ſame; this bargain is ſaid to be perfect at my pleaſure, though I may not take the thing before I have paid the money:—if I do, the ſeller may have treſpaſs againſt me: and if he ſell it to another, I may bring an action on the caſe againſt him. (Noy, 104.) If a contract be to have for cattle ſold 10*l.*, if the buyer do a certain thing, or elſe to have 20*l.* it is a good, and ſufficiently certain contract. Alſo, if I agree with a perſon to give him ſo much for his horſe, as A. B. ſhall judge him to be worth, when he hath judged it, the contract is complete, and an action will lie on it: and the buyer ſhall have a reaſonable time to demand the judgment of A. B. But if he die before the judgment is given, the contract is determined. (Perk. ſect. 112, 114. Shep. Abr. 294.) In contracts, the time is to be regarded, in and from which the contract is made; the words ſhall be taken in the common and uſual ſenſe; and the law doth not ſo much regard the form of words, as the ſubſtance, and the mind of the contracting parties. (5 Rep. 83. 1 Bulſt. 175.) A contract for goods may as well be made by word of mouth, as by deed in writing; and where it is merely written, but not ſealed and delivered, it is the ſame as if it were verbal. But if the contract be by writing ſealed and delivered, and ſo converted into a deed, it is of another nature; and in this caſe generally the action on the verbal contract is gone, and ſome other action lies for the breach of it. (Plowd. 130, 309. Dyer, 90.) Contracts, not to be performed in a year, are to be in writing, ſigned by the party, &c., or no action may be brought on them; but if no day is ſet, or the time is uncertain, they may be good without it. (Stat. 29 Car. II. c. 3.) And by the ſame ſtatute, no contract for the ſale of goods for 10*l.* or upwards, ſhall be good, unleſs the buyer receive part of the goods ſold, or give ſomething in earneſt to bind the contract; or ſome note thereof be made in writing, ſigned by the perſon charged with the contract. See Sale.

Contract, *nude* and *quaſi*. See the adjectives, and Contract *ſupra*.

Contract, *Simple*. See Simple and Debt.

Contract, *Special*. See Specialty and Debt.

Contract, *uſurious*, is a contract to pay more intereſt for money than the laws allow.

It is a devaſtavit in executors to pay a debt upon an uſurious contract. See Usury.

Contract *of Marriage*. The Romaniſts diſtinguiſh the civil contract, which is the conſent of the parties, from the *ſacrament*, which is the benediction of the prieſt.

Thoſe contracts are ſaid to be *null*, which the law prohibits: ſuch are all contracts between perſons incapable of contracting, as minors, religious, lunatics, wives without conſent of their huſbands, &c.

In order to a good civil marriage, the parties muſt not only be willing and able to contract, but actually muſt contract themſelves in due form of law. Any contract made, *per verba de præſenti*, or in words of the preſent tenſe, and in caſe of cohabitation *per verba de futuro* alſo, between perſons able to contract, was before the act (26 Geo. II. c. 33.) deemed a valid marriage to many purpoſes; and the parties might be compelled in the ſpiritual courts to celebrate it *in facie eccleſiæ*. But theſe verbal contracts are now of no force, to compel a future marriage. See Marriage.

Contract, *Original*, in *Engliſh Hiſtory*, denotes that reciprocity of protection and ſubjection, which ſubſiſts between the king of Great Britain and his ſubjects. The duties reſulting from hence are what, according to judge Blackſtone, (Comm. vol. i.) were meant by the convention in 1688, when they declared that king James had broken the "original contract" between king and people. But however, as the terms of that original contract were in ſome meaſure diſputed, being alleged to exiſt principally in theory, and to be only deducible by reaſon and the rules of natural law; in which deduction different underſtandings might very conſiderably differ; it was, after the revolution, judged proper to declare theſe duties expreſsly, and to reduce that contract to a plain certainty. So that, whatever doubts might be formerly raiſed by weak and ſcrupulous minds about the exiſtence of ſuch an original contract, they muſt now entirely ceaſe, eſpecially with regard to every prince, who hath reigned ſince the year 1688. As to the terms of the original contract between king and people, theſe the learned judge apprehends to be now couched in the *coronation oath*; which ſee. See alſo Constitution and King.

Contract is alſo uſed for the inſtrument in writing, which ſerves as a proof of the conſent granted, and the obligation paſſed between the parties.

Among the ancient Romans, contracts, and all voluntary acts, were written, either by the parties themſelves, or by one of the witneſſes, or by a domeſtic ſecretary of one of the parties, whom they call a *notary*; but who was no public perſon, as among us.

The contract, when finiſhed, was carried to a magiſtrate, who gave it a public authority by receiving it *inter acta*, into the number of the acts under his juriſdiction; giving each of the parties a copy thereof, and ſealed with his ſeal. Which practice paſſed into France, where it obtained a long time. The conſcientious performance of private contracts between man and man is frequently recommended in the Koran. For the prevention of diſputes, all contracts are directed to be made before witneſſes, and in caſe ſuch contracts are not immediately executed, the ſame ought to be reduced into writing in the preſence of at leaſt two witneſſes, (which ſeems to have been alſo required by the Jewiſh law, even in caſes where life was not concerned,) who ought to be Moſlems and of the male ſex; but if two men cannot be conveniently had, then one man and two women may ſuffice. The ſame method is alſo directed to be taken for the ſecurity of debts to be paid at a future day; and where a writer is not to be found, pledges are to be taken. Hence, if people truſt one another without writing, witneſſes, or pledge, the party on whom the demand is made is always acquitted if he denies the charge on oath, and ſwears that he owes the plaintiff nothing, unleſs the contrary be proved by very convincing circumſtances. Sale's Koran, Introd. p. 139.

Contracts, in *Rhetoric*, furniſh one head or claſs of external arguments. (See Argument and Topics.) In this view of them, they are either public or private. Public contracts denote tranſactions between different ſtates, as leagues, alliances, and the like; which depend on the laws of nations. Thoſe are called private, which relate to leſſer bodies, or ſocieties of men, and ſingle perſons, and they may be either written or verbal. With reſpect to the force and obligation of contracts, the Roman law declares, that "nothing can be more agreeable to human faith, than that perſons ſhould ſtand to their agreements." Therefore in controverſies relating to this kind of human teſtimony, the party, whoſe intereſt it is, that the contract ſhould be maintained, will plead, that ſuch covenants have the force of private laws, and ought religiouſly to be obſerved, ſince the common affairs of mankind are tranſacted in that manner; and therefore to violate them is to deſtroy all commerce and ſociety among men. On the other ſide it may be ſaid, that juſtice and equity are chiefly to be regarded, which are immutable; and beſides, that the public laws are the common rule to determine ſuch differences, which are deſigned to redreſs thoſe, who are aggrieved. Indeed, where a compact has been obtained by force or fraud, it is in itſelf void, and has no effect either in law or reaſon. But on the other hand, the Roman lawyers ſeem to have very rightly determined, that all ſuch obligations, as are founded in natural equity, though not binding by national laws, and are therefore called "nuda pacta," ought however in conſcience and honour to be performed.

CONTRACTED vein, in *Hydraulics*, (*Vena contracta* of Newton,) is a name given to the contraction which has been obſerved in a ſtream of fluid iſſuing out of an aperture. When water, or other fluid analogous to water, iſſues out of an aperture in the thin ſide or bottom of a veſſel containing that fluid, as at A, *fig.* 1 and 2; *Plate* I. *Hydraulics*, the ſize of the aperture being very ſmall in proportion to the ſide or bottom of the veſſel, the ſtream A B is not of the ſame ſhape throughout its whole length, nor is it of an uniform ſize. When the aperture is circular, the diſtance of the narroweſt part of the ſtream, from the inſide ſurface of the veſſel, is about equal to the radius of the aperture. This narroweſt part of the ſtream has been called *the contracted vein*; the whole ſtream itſelf having been uſually denominated *the vein of fluid*, by writers on the ſubject. From the place of the contracted vein forwards, the ſtream enlarges its dimenſions, and ſometimes divides itſelf into different ſmaller ſtreams. The diameter of the contracted vein, or narroweſt part of the ſtream, is ſubject to a little variation, ariſing from the ſize of the veſſel in proportion to the aperture, and partly from the *charge* of the veſſel, (*viz.* from the height of fluid in the veſſel above the level of the aperture); hence the diameter of the contracted vein, as meaſured by different authors, has not turned out exactly of one invariable dimenſion; the difference, however, is not very material; as appears from the following table, which contains the different meaſurements of the contracted vein; calling the diameter of the circular aperture *one*.

Authors of the experiments.	*Diameter of the contracted vein.*
Poleni (de Caſtellis, § 35.) . - -	0.790
Michelotti; Sperim. Idraul. tom. II. Exp. 4.	0.800
Boſſut (Hydrodyn. art. 437. Exp. 5.) -	0.818
Venturi, with 35 inches charge, and an horizontal circular orifice of 18 lines in diameter - - - -	0.798

From a mean of the above meaſurements, it may be concluded, that the diameter of the contracted vein is little more than eight-tenths of the diameter of the aperture. That ſhort part of the ſtream which ſtands between the aperture and the greateſt contraction, is not uniformly conical, but it approaches to the figure of an hyperbolic conoid.

This contraction of the ſtream is undoubtedly owing to the different directions, and different velocities, with which the various parts (or, as they are called, *filaments*) of the fluid run towards the aperture, as is indicated by the *figs.* 1 and 2. Hence it has been obſerved, that when the aperture is very large in proportion to the ſize of the veſſel, the contraction of the ſtream is leſs evident. And ſuch, alſo, is in great meaſure the caſe, when the ſide of the veſſel in which the aperture is made, is not very thin.

The various filaments of the fluid, which run from every part of the veſſel in oblique directions towards the aperture, partly croſs each other at the contracted vein; and this croſſing, or tendency to croſs, is one of the cauſes which enlarge the ſtream beyond that place. It is evident, that with apertures of different ſhapes, the form of the contracted vein, that is of the ſtream of that place, muſt vary conſiderably. But profeſſor Venturi, deſirous of determining the effects of ſome of thoſe variations from the circular ſhape, made the following experiments with orifices of peculiar ſhapes.

“ In the orifice A B C D, (*fig.* 3.) the two ſides A, B, are parallel to the horizon; the extremities are rounded; the width of this aperture is leſs than two lines, its length 18 lines, and the charge 32.5 inches. The ſection of the ſtream which iſſues from this orifice, firſt aſſumes the form E F, after which, the two extremities E, F, approaching nearer and nearer to enlarge the middle part of the ſection of the ſtream, at 4.5 inches diſtance from the orifice, acquire the quadrangular form G H. The ſtream afterwards extends itſelf in the perpendicular direction, in the form of a large fan K L. I have repeated the experiment, by placing the longitudinal axis of the orifice C D vertically. In this caſe the ſame phenomena were produced, E F becoming vertical, and K L horizontal, both preſerving their form.”

“ The fluid filaments, which, iſſuing out of the orifice, paſs near the two oppoſite borders A, B, are very near each other, and becoming convergent, they tend to unite at a very ſhort diſtance from the orifice itſelf. The filaments C, D, are more remote, and, perhaps, leſs convergent; they cannot unite but at a greater diſtance than the two former. In this caſe, therefore, there are movements which tend to form two contractions, the one nearer, and the other more remote from the orifice; theſe two contractions counter balance each other in part. Their mutual oppoſition carries the effect, G H, to a diſtance five times greater than that of the contracted vein of a circular orifice, having a diameter of the ſame breadth as that of this orifice.”

“ In this experiment we ſee the cauſe of a phenomenon, which has been obſerved in ſome particular caſes by Poleni and others, without giving the explanation. In every orifice of a right-lined figure through a thin plate, the angles of the contracted vein anſwer to the ſides of the orifice and the contrary. When the quadrangular orifice has the ſituation M N O P, the greateſt contraction of the ſtream is made at a greater diſtance than in a circular aperture; it aſſumes the form and ſituation Q R S T. The reaſon is, that the oppoſite angles M, P, are more remote from each other, than the ſides I, V, whence the ſame thing happens as in the long orifice A C B D. In the ſame manner, the triangular orifice in the ſituation X, produces a contraction of the form, and in the ſituation Z, &c.”

When the horizontal oblong aperture, C D, (*fig.* 3.) was uſed, the diſtance of the contracted vein from that orifice, was found to vary with the height of the fluid; as ſhewn in the following table; from which it appears, that the contraction of the ſtream takes place at a greater diſtance, under ſtrong charges, than in thoſe which have but little elevation.

Height of the charge above the orifice C D.	Diſtance of the greateſt contraction G H.
Inches.	*Lines.*
32.5	53.
18.	48.
10.	40.
6.	36.

If a cylindrical tube be fitted to a circular aperture in the ſide of the reſervoir, or veſſel containing the fluid, and part of it be puſhed into the interior part of that veſſel, the contraction of the vein will be greater, and the quantity of fluid that runs out in a given time, will be leſs, than without ſuch tube. If to the external part of the circular orifice, a ſhort tube be adapted exactly of the ſhape of the contracted vein, or very nearly ſo, as in *fig.* 4, (it being a tube nearly conical, but with its ſides a little convex inwardly,) the quantity of fluid that runs out in a given time, will be the ſame, or very nearly the ſame, as when the ſimple aperture is uſed, without ſuch tube.

The velocity of the fluid is far from being the ſame in every part of the ſtream; for ſince the ſame quantity of fluid muſt paſs through every tranſverſe ſection of the ſtream in a given time, it follows, that the velocity muſt be inverſely as the area of each tranſverſe ſection. Therefore the velocity at the contracted vein is greater than at the circular aperture; and ſince the areas of the ſections at thoſe two places, are as the ſquares of their diameters, and the diameter of the contracted vein is to that of the circular aperture nearly as eight to ten, or as four to five; hence we ſay, as 16 is to 25, ſo is the velocity at the aperture, which we ſhall call *one*, to the velocity at the vena contracta; that is, as one to 1.56.

CONTRACTILE Force, that property, or power, inherent in certain bodies, whereby, when extended, they are enabled to draw themſelves up again to their former dimenſions. For the cauſe of this property, which is of the utmoſt conſequence to a right underſtanding of the animal œconomy, ſee Fibre.

CONTRACTION, in *Surgery*, from *contraho*, to draw together; a rigid or ſtiffened ſtate of any part in the body, but eſpecially of the joints. This rigidity may ariſe from a morbid condition, either of the bones, ligaments, or muſcles; and may proceed from a great variety of cauſes. Cullen has given four ſpecies of contractions; but Sauvages has multiplied them to the number of eleven! The ſurgeon who knows the cauſe and ſeat of this complaint, will not, however, pay much regard to thoſe noſological diſtinctions, in his method of cure. If the morbid change ariſes from inflammation and thickening of the parts affected, he will uſe diſcutient remedies, fomentations, and emollient poultices; or, after the inflammatory ſtage has ſubſided, he will employ electricity, friction, ſtimulant embrocations, and moderate extenſion of the affected muſcles, &c. If the rigidity be very obſtinate, and the ligaments yield with great difficulty, the ſurgeon will uſe mechanical force more freely, and perhaps will enjoin the exerciſe of alternate bending and ſtraightening the limb, by means of pulleys or ſteel ſprings, beſides the occaſional adminiſtration of the vapour-bath, or hot ablutions. The principles of the art being underſtood, and the nature of the caſe which comes before us, it will not be difficult, by ſteady perſeverance, to overcome a great number of obſtacles which preſent themſelves, in the treatment of contractions.

When the diſeaſe is occaſioned by an union of the bones which form a joint, the mobility of the limb is not to be expected. This ſpecies of contraction is named *anchyloſis*, and is explained at large in a ſeparate article of this work. (See Anchylosis,) When one muſcle is found in a ſtate of permanent contraction, *e. g.* the ſterno-maſtoid of the neck, it is ſometimes requiſite to divide the muſcle in order to effect the cure. (See Distortion *of the neck*). We underſtand that Mr. Carpue, ſurgeon of his majeſty's forces, has invented many ingenious mechanical inſtruments, which will ſoon be made public, for the relief of this claſs of diſeaſes.

Contraction, in *Grammar*, the reduction of two vowels, or ſyllables, into one; as, *may'nt*, for *may not*; *ſhould'ſt*, for *ſhouldeſt*, &c.

The Greeks abound with contractions, both in their verbs and their nouns.

In this language, two ſimple vowels concurring in the ſame word are generally combined into a diphthong; and in this caſe the concurrent vowels are ſaid to be contracted. Contraction is either *ſimple* or *compounded*; *ſimple*, when conſtituent vowels are retained unchanged; and *compounded*, when a new ſound reſults. *E. G.* The contraction of τειχεϊ into τειχεῖ is ſimple; that of τειχεος into τειχους is compounded. The firſt ſort of contractions is called *ſynæreſis*, the ſecond *craſis*. When two ſucceeding vowels have dots above them, they are ſeparately ſounded; but when contracted, they have over them the circumflex accent; hence τειχεϊ has three ſyllables, but τειχεῖ only two. Every contraction, whether ſimple or compounded, is the coalition of two ſhort vowels; and it takes place in nouns of every declenſion, in adjectives, in verbs, and in the combination of the article and prepoſitions with the ſucceeding words. Simple contractions are all reducible to the following rule.—Let the concurring vowels, inſtead of being ſounded ſeparately, be expreſſed by a ſingle impulſe of the voice; αι ᾶι, αυ ᾶυ, ει εῖ, &c. The difficulty lies in the compounded contractions; but all the varieties of theſe may be comprehended under the four ſucceeding caſes. 1. If the two ſhort vowels to be contracted be the ſame, they are already repreſented by one of them lengthened. Thus αα, ιι, εε, are contracted into ᾶ, ῖ, ῆ, reſpectively. Note, however, that, in the common tongue, the contraction of εε is not into ῆ, but into its equivalent εῖ: and the contraction of οο is not into ω, but into ου. 2. If the concurrent vowels be not the ſame, that which is predominant in ſound prevails over that which is ſubordinate to it. The predominant vowel muſt in moſt inſtances be the prepoſitive; ſince this pre-occupies the organs, and thus demands a fuller enunciation. The ſubjunctive, therefore, is loſt in the contraction; and its only effect is to lengthen the prepoſitive, when a *doubtful vowel*, but to convert it, if *ſhort* by nature, into its correſpondent long one. Hence αε, εα, οα, and οε are contracted into ᾶ, ῆ, ω, and ω reſpectively. The exceptions to the above principle are the following: verbs in μι of the firſt claſs, in order to be diſtinguiſhed from the third perſon plural, have in the three ſingular, αε contracted into η. The diphthongs εα, οα, when ſucceeded by ς are contracted, the former into ει, and the latter into ου. If a vowel, or ρ, precede εα, they are contracted into α. By attention to the pronunciation of ο, α, ε, it will be perceived that the firſt, having a fuller ſound, predominates over the ſecond and third; and, therefore, αο are contracted, not into ᾶ, but into ῶ. In the concurrent vowels εο, the latter prevails in ſound over the former, and conſequently, the contraction is into ου, not into ω. Conformably to the ſecond caſe οε would be contracted into ω; but its contraction, in the common tongue, like that of εο, is generally into ου. 3. The vowels ιυ, being predominant in ſound, and from their nature incapable of coaleſcing with thoſe ſubjoined to them, cauſe the ſubjunctive to be expelled: as ιεραξ, ιραξ, a hawk, οφιας, οφις, a ſerpent, ιχθυας, ιχθῦς, fiſhes, &c. 4. As the contraction is the union of two ſhort vowels into one compound ſound, it follows, that a ſhort vowel preceding a long one, as having no effect in lengthening a ſound which does not admit of different degrees of length, is dropped in the contracted form; as Απελλεης, Απελλῆς, Apelles, Βασιλεων, Βασιλῶν, kings, τιμαω, τιμω, I honour, &c. When a vowel precedes a diphthong, it is either itſelf rejected, or it cauſes to be rejected one of the conſtituents of that diphthong: thus, α preceding ει, ου, expels the ſubjunctives ι, υ; but preceding οι, α is itſelf rejected. In like manner, ε is rejected, when preceding ει, οι, or ου. When ο precedes ει, it requires in nouns and adjectives the rejection of the ſubjunctive: alſo in the infinitive mood of verbs in οω, ο preceding ει requires ι to be rejected; but in the ſecond and third perſons ſingular indicative, the prepoſitive is dropped. Before οι and ου, ο is itſelf rejected. In the adjectives απλοη ſimple, διπλοη double, ο is expelled;—thus, απλῆ, διπλῆ. See Jones's Grammar of the Greek Tongue, on a new and improved Plan, part ii. chap. 1.

Contraction, in *Logic*, or *Compoſition*, a ſpecies of reduction, wherein the thing that reduces does alſo abridge, or bring the thing reduced into a leſſer compaſs.

The deſign of contraction is to bring things, which before were too lax and diffuſive, nearer together; that ſo their mutual relation may appear the more clearly, and they may better ſtrengthen and ſupport each other.

To this head are referred the arguments, as they are called, of poems and orations; the titles and ſummaries of chapters, &c. See Abridgment.

Contraction, in a general ſenſe, means diminution of the bulk, or extent, of any thing; the nearer approach of its parts to one another. This word is generally uſed in philoſophy, in ſurgery, in grammar, in the arts, &c. In philoſophy the contractions moſtly noticed, are thoſe which ariſe from a diminution of temperature. The ſhortening of the dimenſions of a body is the general effect; but at certain periods of their contraction, bodies change their apparent ſtate of exiſtence; thus the vapour of water is contracted by a diminution of temperature from a higher degree, down to about 212° of Fahrenheit's ſcale; but below that degree, its contraction is very great, and it is thereby converted into fluid water, in which ſtate it occupies not more than about the 1800th part of the ſpace it took up a little before its converſion into water. Similar phenomena are to be obſerved with moſt other bodies, and the particulars which need be remarked concerning them, are the rate, the quantity, and the limits of contraction in different bodies. But thoſe particulars being the reverſe of the phenomena which are deſcribed under the denomination of *expanſion* or *dilatation*, are with more perſpicuity ſtated under thoſe articles, to which the reader is referred. It is, however, neceſſary in this place briefly to ſtate a few particulars which ſeem leſs regular, and ſome which ariſe, not from a ſimple cauſe, but from the compound effect of preſſure, and of diminution of temperature.

"When an elaſtic fluid is contracted by cold within certain limits, determined by a degree of preſſure to which it is expoſed, as well as by the nature of the fluid, its particles become ſubjected to the force of coheſion; they ruſh ſtill nearer together, and form a liquid. Thus, when ſteam under the common atmoſpheric preſſure, is cooled below the heat of boiling water, it is inſtantly condenſed, and becomes water; but with a preſſure of two atmoſpheres, it would be condenſed at a temperature 36° higher, and with the preſſure of half our atmoſphere only, it might be cooled without condenſation 33° lower than the common temperature of boiling water. And ſimilar effects take place in vapours of other kinds at higher or lower temperatures, a double preſſure producing, in all caſes, an equal diſpoſition to condenſation, with a depreſſion of temperature of between 20 and 40 degrees, and moſt commonly of about 35° of Fahrenheit. Thus the vapour of ſpirit of wine is uſually condenſed at 175° of Fahrenheit; but with a double preſſure it is condenſed at a temperature 39° higher; and with the preſſure of half an atmoſphere, at a temperature 35° lower; and the vapour of either, which is commonly condenſed at 102°; requires a temperature 38° higher, with a double preſſure, or as much lower with half the uſual preſſure. If the temperature be below the freezing point of the liquid, the preſſure being ſufficiently leſſened the vapour may ſtill retain its elaſticity, but a further reduction of temperature or increaſe of preſſure will convert it immediately into a ſolid."

Water, and all aqueous fluids, are gradually contracted by a diminution of temperature, until they arrive at a certain point which is about eight degrees above the freezing point; but below that point they begin to expand and continue to do ſo according as their temperature is lowered. Effects nearly ſimilar have been obſerved with a few metallic ſubſtances.

Speaking of contraction, a remarkable phenomenon, of conſiderable importance in manufactures, obtrudes itſelf on our notice. It is the hardneſs which certain bodies acquire in conſequence of a ſudden contraction, and this is particularly the caſe with glaſs and ſome of the metals. Thus glaſs veſſels ſuddenly cooled after having been formed are ſo very brittle, that they hardly bear to be touched with any hard body. The cauſe of this effect is thus properly explained by Dr. Young. "When glaſs in fuſion is very ſuddenly cooled, its external parts become ſolid firſt, and determine the magnitude of the whole piece; while it ſtill remains fluid within. The internal part, as it cools, is diſpoſed to contract ſtill further, but its contraction is prevented by the reſiſtance of the external parts, which form an arch or vault round it, ſo that the whole is left in a ſtate of conſtraint; and as ſoon as the equilibrium is diſturbed in any one part, the whole aggregate is deſtroyed. Hence it becomes neceſſary to anneal all glaſs, by placing it in an oven, where it is left to cool ſlowly; for, without this precaution, a very ſlight cauſe would deſtroy it. The Bologna jars, ſometimes called proofs, are ſmall thick veſſels, made for the purpoſe of exhibiting this effect; they are uſually deſtroyed by the impulſe of a ſmall and ſharp body, for inſtance, a ſingle grain of ſand, dropped into them, and a ſmall body appears to be often more effectual than a larger one; perhaps becauſe the larger one is more liable to ſtrike the glaſs with an obtuſe part of its ſurface." See *Prince* Rupert's *Drops*.

The hardening of ſteel is an effect of the ſame ſort. The piece of ſteel is made red-hot, and, in that ſtate, is ſuddenly cooled and contracted by immerſion in water; in conſequence of which it remains ſo brittle and hard, as not to ſuffer its being filed or hammered. If, inſtead of water, the piece of red-hot ſteel be plunged in oil, its contraction is not ſo ſudden, and of courſe its hardneſs will not be ſo great. If it be plunged in quickſilver, which cools it much quicker than water, its hardneſs becomes ſo great as to render it capable of cutting or ſcratching glaſs like a ſilicious body. But, on the other hand, if the piece of ſteel, after its having been rendered red-hot, be ſuffered to contract gradually in the air; then its texture will eaſily yield to the hammer or to the file.

The neceſſity and importance of attending to the minute variations in the bulk of bodies by heat and cold, was never before, perhaps, ſo ſtrikingly exemplified, as in the government Trigonometrical Survey, begun under general Roy, in the year 1784, by the meaſurement of a baſe of 27404.3 feet in length on Hounſlow Heath, near London. This was firſt meaſured by long deal rods, which were ſoon laid aſide, on account of their great and variable contraction and expanſion, and long glaſs rods or tubes were next tried wherein the ſum of the expanſions of the rods, during the operation, reduced to 62° of Fahrenheit's thermometer, amounted to 6 inches very nearly, and of the contractions to 1.8 inch nearly, making an addition of 4.2 inches to the length of the baſe, as meaſured by the glaſs rods, on account of their expanſion and contraction during the operation; ſee Phil. Tranſ. 1785, p. 477. In 1791, this baſe was remeaſured with a ſteel chain made for the purpoſe by Ramſden, with all imaginable attention to accuracy, and the correction neceſſary to be applied to the length of the baſe, on account of the exceſs of the expanſions over the contractions of the chain during the operation, was found to be 34.2 inches, but from which 27.11 inches was afterwards deducted, for reducing the baſe to the length which would have reſulted, from a meaſurement in the temperature of 62°, to which point of the thermometer's ſcale all lengths in this ſurvey are ſuppoſed to be reduced. See Phil. Tranſ. 1795, p 433.

Contraction *of Strata*, in *Natural Hiſtory*. That clay and argillites have contracted during their hardening in the ſtrata of the earth, Mr. Bergman infers from having obſerved, that the petrified ſhells found in theſe are commonly compreſſed and flatted, and that argil hardens by contraction, but thoſe found in lime-ſtone retain their primitive ſhape, becauſe theſe harden chiefly by infiltration.

Contraction is frequently uſed, by anatomical writers, to expreſs the ſhrinking up of a fibre, or an aſſemblage of fibres when extended.

Convulſions and ſpaſms proceed from a preternatural *contraction* of the fibres of the muſcles of the part convulſed.

On the contrary, paralytic diſorders generally proceed from a too great laxneſs of the fibres of the parts affected; or from the want of that degree of *contraction* neceſſary to perform the natural motion or action of the part.

In the firſt, therefore, the animal ſpirits are ſuppoſed to flow either in too great a quantity, or irregularly; and, in the laſt, the animal ſpirits are either denied a free paſſage into the part affected, or the tenſion of the fibrillæ is ſuppoſed inſufficient to promote the circulation.

Contraction evidently appears to be the true natural ſtate of all muſcles; for, if a muſcle be at any time freed from the power of its antagoniſt, it is immediately found to *contract*; and is not, by any action of the will, or the ſpirits, to be reduced to a ſtate of dilatation.

Contraction *of the heart*, *arteries*, *lungs*, *&c.* See Systole, Heart, Artery, Pulse, &c.

CONTRADICENTE. See Nemine *contradicente*.

CONTRADICTION, a ſpecies of direct oppoſition, wherein one thing is found diametrically oppoſite to another.

The ſchoolmen uſually define it, *oppoſitio inter ens & non-ens medio carens*: where, by *ens*, and *non-ens*, are underſtood any two extremes, whereof one affirms, and the other denies; and it is ſaid to be *medio carens* to diſtinguiſh it from the other ſpecies of compoſition; the extremes, here, neither agreeing in ſubject, as is the caſe in privation; nor in eſſence and kind, as in contrariety.

Contradiction, *freedom of.* See Freedom.

Contradiction, *imply a.* See Imply.

CONTRADICTOR, in a legal ſenſe, a perſon who has a right or title to contradict or gainſay.

An inventory of the effects of a minor ought to be made in preſence of his guardian, or truſtee, who is the legal *contradictor:* a decree againſt a farmer has no effect on the landlord, the firſt not being the legitimate *contradictor.*

CONTRADICTORY Propositions, are oppoſites, one of which imports a mere, and naked, denial of the other.

Of theſe, therefore, one muſt be poſitive, and the other negative; as *ſitting,* and *not ſitting: white,* and *not white.* Contradictory propoſitions mutually deſtroy each other.

To have two propoſitions truly contradictory, they muſt be oppoſite, both in quantity and quality, *i. e.* one muſt be univerſal, and the other particular, which make the oppoſition of quantity; and the one affirmative, and the other negative, which make the oppoſition in quality. Thus, *v. gr.* "All uſe of wine and ſilver is evil;" falſe:—"Some uſe of wine and ſilver is not evil;" true. To this it is neceſſary, that the one deny and the other affirm, the ſame thing, of the ſame ſubject, conſidered in the ſame circumſtances: unleſs the queſtion be about an eſſential attribute, in which caſe, no regard is had to circumſtances; every thing having always its own eſſence. This the logicians expreſs by *affirmare & negare idem, de eodem, ſecundum idem.*

There may likewiſe be contradictory propoſitions on a particular ſubject; *e. gr.* an individual. Theſe are called *ſingle* contradictory propoſitions; as "Peter is innocent, Peter is not innocent, or is a criminal." Now to have theſe propoſitions contradictory, Peter muſt be conſidered at the ſame time, without which they may be both true; ſince there may be a time wherein Peter was innocent, and another wherein he was a criminal.

CONTRA-FISSURE. See Counter-*fiſſure.*

CONTRA-HARMONICAL Proportion, that relation of three terms, wherein the difference of the firſt and ſecond is to the difference of the ſecond and third, as the third is to the firſt.

Thus, *e. gr.* 3, 5, and 6, are numbers contra-harmonically proportional; for 2 : 1 :: 6 : 3.

To find a mean contra-harmonically proportional to two given quantities: the rule is, divide the ſum of the two ſquared numbers by the ſum of the roots; the quotient is a *contra-harmonically* mean proportional between the roots.

CONTRA-INDICATION, in *Medicine,* denotes ſuch a ſymptom, or ſet of ſymptoms, as indicate the neceſſity of remedies, which other ſymptoms, or the diſeaſe in general, forbid us to employ.

Thus, when inflammation of the lungs ſupervenes to a low or typhous fever, or *vice verſâ,* the nature of the fever requires cordials and ſtrengtheners for its cure, whilſt the inflammation indicates, on the contrary, the uſe of blood-letting, and other debilitating expedients. Contra-indications are always perplexing occurrences.

CONTRAINT, Fr. reſtrained. This word is ſynonymous with *ſtretto,* in Ital. (which ſee.) It is an adj. which, in *Muſic,* implies, whether in melody or harmony, the *conſtraint* of a theme or ground.

CONTRALTO, *Ital.* the *Counter-tenor.* The compaſs of this kind of voice is uſually very limited; it ſeldom goes lower than G, in the 4th ſpace of the baſe, or higher than C, in the 3d ſpace of the treble. Seneſino had no more than ſix or ſeven good notes in his voice; nor had Guadagni, in his younger days, when he was content with the force of his natural compaſs, which, like Seneſino's, were full, rich, and flexible. This ſpecies of voice is an octave above the baſe; and its clef, that of C on the 3d line, the ſame as the *alto viola,* or *tenor,* among inſtruments.

CONTRAMANDATIO Placiti, in *Law-Books,* ſignifies a reſpiting, or giving the defendant further time to anſwer; or, an imparlance, or countermanding of what was formerly ordered. Leg. H. I. c. 59. See Countermand.

CONTRAMANDATUM, a lawful excuſe, which the defendant, by his attorney, allegeth for himſelf, to ſhew that the plaintiff has no cauſe to complain, *ſi dies placiti ſit contramandatus.* 11 Hen. I. See Countermand.

CONTRAMURE, in *Civil Architecture.* See Countermure.

Contramure, in *Fortification,* is a wall built before another to ſtrengthen it, and to prevent its receiving any damage from the adjoining buildings. See Rampart.

CONTRA-POINTS, in *Muſic.* See Counter-point.

CONTRA-POSITIO, in *Law,* a plea or anſwer. Leg. H. I. c 34.

CONTRA-POSITION, in *Logic.* See Conversion.

CONTRAPPUNTO. See Counter-point.

CONTRARIENTUM Rotulus. See Rotulus.

CONTRARIETY, that which denominates two things contrary to each other.

Contrariety conſiſts in this, that one of the terms imports a negation of the other, either mediately or immediately; ſo that contrariety may be ſaid to be the contraſt, or oppoſition of two things, one of which implies the abſence of the other.

Contrariety, *freedom of.* See Freedom.

CONTRARIES, are poſitive oppoſites; which being of the ſame kind, or ſame common nature, and ſubſiſting by turns in the ſame ſubject, are as remote from each other as poſſible, and mutually expel each other. Such are whiteneſs and blackneſs, cold and heat, &c.

Hence, properly ſpeaking, only qualities can be contraries: *contrariety,* in effect, only agrees to qualities *per ſe;* to other things it agrees *per accidens,* or *in ordine ad qualitatem.*

CONTRARY, however, is often uſed in a more extenſive ſignification, *viz.* for any inconſiſtence or difference between the nature and qualities of things. It is a popular maxim in philoſophy, that *contraria juxta ſe poſita magis eluceſcunt;* contraries ſet off one another. In this ſenſe is the word *contrary* uſed in the ſchools; and hence an argument *à contrario.*

This method of improving things, *è contrario,* is much uſed, and with good ſucceſs, by F. Bourdaloue, in his Sermons.

Contrary, in *Rhetoric.* Contraries are things which, under the ſame genus, are at the utmoſt diſtance from each other: ſo that what we grant to the one, we utterly deny the other; *e. g.* "Virtue ought to be embraced, therefore vice ſhould be avoided." F. de Colonia lays down three kinds of contraries in rhetoric; viz. *adverſatives, privatives,* and *contradictories.*

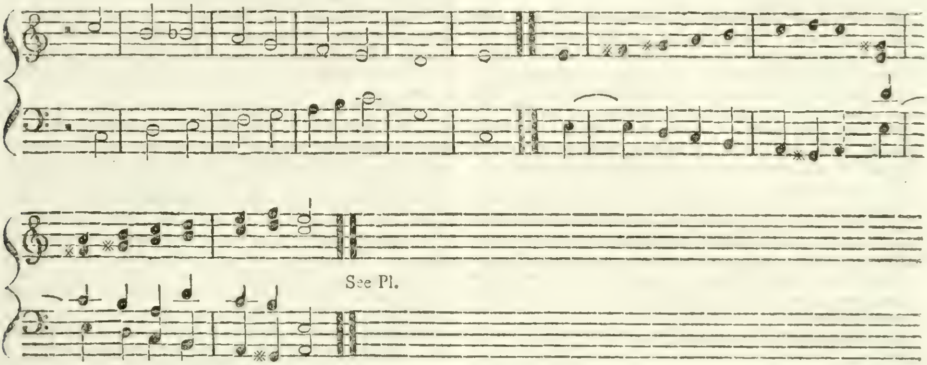
Adverſatives are thoſe that differ much in the ſame thing, as virtue and vice, war and peace: thus Tully, "Si ſtultitiam fugimus, ſapientiam ſequamur; & bonitatem, & malitiam,"

tiam." And Quintilian, "Malorum cauſa bellum eſt, erit emendatio pax." Drances argues thus in Virgil:

"Nulla ſalus bello: pacem te poſcimus omnes."

Privatives are habits, and their privations. *Contradictories* are thoſe, one of which affirms, and the other denies, the ſame thing of the ſame ſubject.

CONTRARY *motion*, in *Muſic*, is when one part aſcends while another deſcends, and *vice verſâ*, oppoſed to *moto retto*, and *moto obliquo*, which ſee.



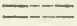
Contrary motion of the parts, in compoſition, and of the hands in thorough-baſe, has a pleaſing effect, and precludes the ſucceſſion of 5ths and 8ths.

CONTRARY *propoſitions*, in *Logic*, univerſal propoſitions, one of which affirms, and the other denies, the ſame predicate of the ſame ſubject; as "every ſquare is a parallelogram," and "no ſquare is a parallelogram." Theſe propoſitions differ in quality, but not in quantity, and therefore are diſtinguiſhed from contradictory propoſitions, which differ in quantity and quality.

Contrary propoſitions cannot be both true, but may both be falſe: whereas, in contradictory propoſitions, one is neceſſarily true, and the other falſe.

CONTRARY *point of flexure*. See POINT.

CONTRA-SOGGETTO, in *Muſic*, a 2d ſubject in a fugue or canon, or a new ſubject, in contrary motion to the firſt.

CONTRA-TONES, in the *German Muſical Writings*, are ſuch as lie below the great octave of their tablature or literal notation, for the notes of the gamut. All notes on an organ, or other inſtrument which lie, more than two octaves below the tenor cliff note, or , are ſaid to be contra-tones. See TABLATURE.

CONTRAST, in *Muſic*, is often productive of agreeable effects, when, in the ſame movement, we paſs from loud to ſoft, and ſoft to loud; from quick to ſlow, and ſlow to quick; from a ſimple to an elaborate accompaniment, and *e contra*; from low to high, and high to low; and when the harmony is full and thin alternately.

CONTRAST, in *Painting* or *Drawing*. The proper introduction and management of contraſts of lines, forms, colours, lights, and ſhadows, form a very principal, and indeed indiſpenſable, branch of the ſtudy of a painter; and there is perhaps nothing in the art which ſo neceſſarily requires a more than ordinary ſhare of judgment and diſcretion. If contraſts are only ſparingly uſed, they ſeldom fail to produce a ſtriking and happy reſult; if they are too frequent, confuſion in the compoſition, and a ſpotty diſagreeable effect is the conſequence; when they are entirely omitted, inſipidity enſues. Contraſts in painting may, therefore, be compared to diſcords in muſic, which, when ſkilfully introduced, give double reliſh to the harmony, by preventing that nauſea naturally attendant on an uninterrupted ſucceſſion of ſweets of any kind ſoever. The ſubject of contraſts is neceſſarily connected with our inquiries reſpecting the great component parts of painting. We therefore beg to refer the reader to thoſe articles. See INVENTION, COMPOSITION, DESIGN, EXPRESSION, CLAIR-OBSCURE, and COLOURING.

CONTRAST, *to*, in *Architecture*, is to avoid the repetition of the ſame thing, in order to pleaſe by variety; as is done in the great gallery of the Louvre, where the pediments are, alternately, arched and angular.

CONTRAST, or CONTRATE, *wheel*, in *Horology*, denotes that wheel in watches which is next to the crown, whoſe teeth and hoop lie contrary to thoſe of the other wheels; whence its name. See WATCH-*work* and WHEEL.

CONTRAVALLATION, or COUNTERVALLATION, in *Fortification*. See CIRCUMVALLATION.

CONTRAVENTION, a man's failure of performing or diſcharging his word, obligation, or duty, or the laws and cuſtoms of the place. The penalties impoſed in caſes of contravention, only paſs for comminatory.

In a more limited ſenſe, contravention implies the non-execution of an ordinance, or edict.

Contravention is ſuppoſed to be a degree below prevarication; and to be only the effect of negligence or ignorance.

In the French and other ſervices, every commanding officer, of whatever rank, was reſponſible for the wrongs and treſpaſſes committed by the troops under his command. He was obliged to pay the damages; and if himſelf ſet an example of ſuch things, he was conſidered as doubly culpable, and was not only bound to pay the damages, but was otherwiſe puniſhed.

CONTRAYERVA, in *Botany*. See DORSTENIA.

CONTRAYERVA, in the *Materia Medica*, *Dorſtenia Contrayerva*, Linn. This is a perennial plant of South America, the root of which has long been uſed in medicine, and is ſtill retained, though its medicinal powers are but moderate. It is ſaid to have been firſt brought into Europe by ſir Francis Drake, about the year 1581, and from him called *Drakena*.

It was then eſteemed a very great alexiterial, and a ſovereign antidote againſt poiſon.

Its juice is a violent poiſon, ſaid to be uſed by the Peruvians to poiſon their arrows. *Contrayerva* ſignifies *counter-poiſon*, becauſe the root of it is ſaid to be an antidote againſt the poiſon of its juice.

The root is knotty, reddiſh brown externally, and pale within: its taſte is ſub-aſtringent, warm, and ſomewhat bitter; but its acrimony is much ſheathed by the very large quantity of mucilage which it contains. Contrayerva is a gentle ſtimulant. Its uſe is almoſt entirely confined to the pulvis contrayervæ compoſitus, in which it is mixed with crab's claws and chalk. The London Pharmacopeia directs the preparation of it, by mixing 5 ounces, by weight, of powdered contrayerva with $1\frac{1}{2}$ pound of compound powder of crab's claws.

There is another kind of *contrayerva* brought from Virginia, more ordinarily called *ſerpentaria*: this is very aromatic; it is but ſeldom preſcribed ſingly, though ſaid to have the ſame ſucceſs againſt poiſons and venoms with the contrayerva of Peru. This is an excellent ſubſtitute for the contrayerva. See Lewis's Mat. Med. and Newman's Chem. Works.

CONTRE, Fr. in combination with words. See Counter.

Contre-*dance*, Fr. *Country-dance*, taken from the lively and familiar dance of our peaſants and villagers in England. Some, however, imagine that, during the Norman line, we had this rural dance from the French *contre-dance*, in which the partners are placed oppoſite or againſt each other. Of this opinion was the late Mr. Donoyer, dancing-maſter to the royal family.

Contre-*ſens*. The French make uſe of this expreſſion, in *Muſic*, for an abſurdity in compoſition or performance.

Contre-*temps*, *Fr.* is a breach of time, or falſe accentuation. Rouſſeau. But M. Framery (Encycl. Meth.) is not ſatisfied with this definition. According to him, an air is *à contre-temps*, or out of meaſure, when the cloſes are prepared on the accented part of a bar, and made on the unaccented part. The ear expects that the cloſe or final part of an air or movement ſhould be on an accented part of a bar; in common time of four crotchets, on the firſt and third; and in triple time, on the firſt note of a bar. To this we accede, except in Poliſh airs, called *Poloneſi*, or *alla Polacca*, where the cloſe is made on the ſecond note of a bar. See Polonese.

CONTREBIA, in *Ancient Geography*, *Santavert*, a town of Spain, in the country of the Carpetani, eaſt of Complutum. This town, in 571 or 572, was beſieged by the Romans, under the conduct of Q. Flavius Flaccus; and, in conſequence of the delay of ſuccour, ſolicited from the Celtiberians, was obliged to ſurrender. When the Celtiberians afterwards arrived, they were ſurpriſed by the Romans, and totally defeated.

CONTREKI, in *Geography*, a town of Arabia, 180 miles S. of Moſcat.

CONTRES, a ſmall town of France, in the department of Loir and Cher, and chief place of a canton in the diſtrict of Blois. Its population amounts to 1401, and that of the canton to 10,105, perſons, divided among 16 communes, upon a territory of 265 kiliometres in extent. It is ſituated 10 miles S. of Blois.

CONTRI, Antonio, in *Biography*, was the ſon of a lawyer at Ferrara. In his youth he ſpent ſome time in the ſtudy of deſign, which he practiſed many years in the two capitals of Rome and Paris. Upon his return to Italy, he ſettled at Cremona, where he ſtudied the painting of landſcape, under Franceſco Baſſi. His pictures were frequently embelliſhed with flowers: a ſpecies of painting in which he moſt excelled. But his claim to a place in this work reſts principally on a very extraordinary diſcovery which he made, of the method of transferring pictures, painted in freſco on the wall, to canvas, without in the ſmalleſt degree impairing the original beauty of the painting. This he effected by means of a ſtrong cement, or roſin, which he ſpread over a cloth, the ſame ſize as the picture he was deſirous of removing. This was then firmly applied to the face of the freſco. A pannel of the ſame ſize was then faſtened to the back of the cloth, when the plaſter or freſco was cut round to the ſize of the cloth. After ſome days, the board with the cloth was removed from the wall, drawing with it the painting. Another cloth, prepared with a cement ſtill ſtronger than the firſt, was then applied to the back of the picture; after which the former cloth was removed, leaving the picture in its original ſtate of perfection. He ſucceeded in many experiments of this kind in Cremona, Ferrara, and Mantua. This ſecret, however, has been ſeldom divulged; and the late pope, Pius VI., for many years, gave a conſiderable penſion to the only perſon who was acquainted with it at Rome, upon the condition of his removing no freſco paintings from the Eccleſiaſtical State without his permiſſion: wiſely judging, that though the temples and palaces of Italy might be deſpoiled of oil pictures, the freſcos of the great maſters would at all times furniſh ſufficient example for ſtudents, and ample gratification to the curious traveller. Antonio Contri died in 1732, leaving a ſon named Franceſco, who followed the footſteps of his father. Lanzi, Storia Pittorica.

CONTRIBUTA, in *Ancient Geography*, *Medina de las Torres*, a town of Spain, in the eaſtern part of Betica; called alſo "Julia Contributa."

CONTRIBUTION, the payment of each perſon's quota, or the part he is to bear in ſome impoſition, or common expence.

Contributions are either *involuntary*, as thoſe of taxes and impoſts; or *voluntary*, as thoſe of expences for carrying on ſome undertaking for the intereſt of the community.

When goods are caſt into the ſea, for the ſafe-guard of a ſhip, or other goods, &c. aboard, in a tempeſt, there is a contribution among merchants, towards the loſs of the owners. (See Insurance.) And where a robbery is committed on the highway, and damages are recovered againſt one or a few perſons, in an action againſt the hundred, the reſt of the inhabitants ſhall make contribution to the ſame. 27 Eliz. c. 13. See Robbery.

Contributions, *Military*, denote impoſitions, duties, or taxes, which places and ſometimes frontier countries pay to redeem themſelves or purchaſe exemption from being pillaged, plundered, and inſulted by the enemy.

It would coſt a prince often too much to make war entirely at his own expence. If he adopt juſt meaſures according to his finances not to run ſhort of money, he takes them alſo with his general for finding the means of augmenting or at leaſt ſparing his funds. Theſe means are contributions, which are of two kinds, *viz.* thoſe which are exacted in ſubſiſtence and commodities, and thoſe which are received in money.

Thoſe that are paid in commodities, or ſubſiſtence, are different ſorts of grain, forage and proviſions, carriage for things wanted as well by water as by land, wood of every ſpecies, pioneers, and a particular treatment or entertainment of troops in their winter-quarters and lodgings.

No levy ought to be made or taxes raiſed till a juſt ſtatement is procured of the ſituation of the country intended to be laid under contribution, that the impoſition may be rendered as equitable and little burthenſome as poſſible. No demand, for example, is made of wood on thoſe places that have only grain or meadows, or of land-carriages on thoſe who make uſe of water-carriage.

The levy of different ſorts of grain is made on thoſe tracts or diſtricts of country, that have quietly and peaceably reaped their harveſt, and as it were by way of gratitude or acknowledgment for the tranquillity they have enjoyed, through the good behaviour and diſcipline of the army.

That of oats and other grain for horſes ſhould be made under the colour or pretext of regularity or good order, by which means a country is infinitely leſs burthened than it would be, were it abandoned to the avidity of horſemen, who would carry off the grain, whereſoever they might find it, either in a regular or irregular manner, or with orders or without orders.

That of forage ſhould be made in the ſame manner, and a convenient time ſhould be fixed on for the carriages that are to carry it to the places, where it is reſolved it ſhall be conſumed and made uſe of.

That of proviſions is uſually made, if it be poſſible, in thoſe diſtricts of country, where the troops cannot winter, to prevent the occaſioning of a ſcarcity in that where they are to take up their winter-quarters.

Carriage, whether by land or by water, is neceſſary for filling the magazines made in the rear of the armies with ammunition and proviſions; or for the taking of heavy artillery and ammunition to a place beſieged; or for the removing of ſick and wounded; or for the tranſport of materials deſtined for works.

Impoſitions of wood are made for paliſades, for the conſtruction of caſernes and ſtables, &c. and for fuel to the troops in winter.

Pioneers are aſſembled or collected together to fortify poſts deſtined for wintering the troops in; for throwing up with promptitude and expedition lines of circumvallation round a place beſieged; for repairing roads and opening defiles; for the conſtruction of lines made with a deſign to cover a country and thereby exempt it from *contributions*; and for levelling and filling the works made before a place after it is taken.

Utenſils and neceſſaries for the troops taken in an enemy's country are raiſed or obtained in two ways. The places, where they winter, ſhould not furniſh more of them than the conveniencies which the ſoldier finds in the houſe of his landlord, ſuppoſing there are no barracks in theſe places. But if there are barracks, the contribution in money is compenſated by theſe commodities, and ought to be leſs than that which is raiſed on a level country or in towns, where there are no troops lodged.

The contribution in money is extended as far as poſſible. It is eſtabliſhed in two ways; voluntarily over tracts of country within reach of poſts and places deſtined for winter-quarters; or by force, whether by the army itſelf whilſt it is advancing, or by large parties that are detached for penetrating into thoſe parts which you wiſh to lay under contribution.

It is made alſo behind the places belonging to the enemy and rivers by means of terror, whether by incendiaries diſguiſed, who ſpread and diſſeminate billets, or by different ways, in which ſmall parties are made to paſs the rivers, who endeavour to carry off ſome perſons of conſideration in the country, or to burn ſome large habitation, or dwelling place, or building.

A prince in ſhort ought to have an exact account kept of all contributions, and have thoſe particularly looked after, who are employed in raiſing and collecting them, ſince it is but too common for them to make an improper uſe of what they raiſe or collect for their own perſonal advantage. And when the contributions are not judiciouſly aſſeſſed and demanded, the particular intereſt of thoſe who impoſe them, or receive them, always prevails over the intereſt of the prince or ſovereign.

It is a great relief and eaſement in contributions, when they are impoſed with juſtice, equality, and in an exact proportion to the abilities of thoſe on whom they are raiſed; and when they are collected without inſolence, without ſeverity or oppreſſion, and without being converted to the profit or benefit of individuals; and when, in default of money, other goods and commodities are taken, as cloths, proviſions, &c. but moſt of all when an army quits its own country to make war in that of the enemy or any other, whatever it may be.

Frederic II., or the Great, in ſpeaking of the conduct of an officer ſent out to levy contributions, expreſſes his ſentiments in the following words: "Contributions are generally levied under one of the following circumſtances; either being ſuperior to the enemy you cover the whole country; or you poſſeſs a part of it till the arrival of the enemy; or you are interrupted by their light troops.

"In the firſt caſe it is common for the commander in chief to fix the ſum to be raiſed by the inhabitants, under pain of military execution. Upon this duty the officer muſt vigorouſly exert his utmoſt authority to make his huſſars obſerve the ſtricteſt diſcipline and decorum, leſt the inhabitants ſhould be ruined beyond recovery.

"The ſecond caſe requires great circumſpection in the officer, and a perfect knowledge of the country, that he may not be ſurpriſed by the unexpected arrival of the enemy; he muſt pre-determine his plan of retreat, and fix the place of general depoſit; and for his farther ſecurity he muſt advance ſmall detachments towards the enemy, that he may have early notice of their approach, and ſo interrupt all communication with the inhabitants.

"On his firſt arrival in the country, he will diſpatch circulating billets of delivery, the duplicates of which are to be carried by the parties which are ſent to levy the contributions. Theſe parties are to have orders to return at a certain time, beſides which they are to have ſealed inſtructions indicating the places of ſecond and third rendezvous, but theſe orders are not to be opened unleſs in caſes of neceſſity.

"When contributions are to be raiſed in this manner, with the enemy at your heels, all lenity is out of the queſtion. Where there is no coin to be had you muſt take any thing, that may be eaſily tranſported, or cattle, or hoſtages; but theſe only as your laſt reſource. If you are cloſe preſſed by the enemy, it is beſt to divide your booty and ſend it different roads, that you may ſave at leaſt ſome part of it.

"In the third caſe, namely, when the enemy hinders the inhabitants from delivering their quota, the peaſants are in great danger of total ruin. Nevertheleſs, as the exigencies of the army require it, you are to proceed with all poſſible rigour, and even to puniſh thoſe who neglect to deliver their proportion at the time required, that the reſt through fear may be more punctual in obeying the orders they have received."

CONTRIBUTIONE Facienda, in *Law*, a writ which lies where ſeveral perſons are jointly bound to the ſame thing, and one or more of them refuſe to contribute their ſhare.

If tenants in common, or joint, hold a mill *pro indiviſo*, and equally ſhare the profits of the ſame; the mill falling to decay, and one or more of them refuſing to contribute to its reparation, the reſt ſhall have the writ *de contributione facienda* to compel them. And if there be three coparceners of land that owe ſuit to the lord's court, and the eldeſt performs the whole; then may ſhe have this writ to compel the refuſers to a contribution. So when one ſuit is required for land, and that land being ſold to divers perſons, ſuit is demanded of them all, or ſome of them by diſtreſs, as entirely as if all the land were ſtill in one. Reg. Orig. 175. F. N. B. 102.

CONTRITION, in *Theology*, expreſſes a real ſorrow, reſulting from the thought of having offended God; from the ſole conſideration of his goodneſs; without any regard, or, at leaſt, independently of any reſpect, to the puniſhment annexed to the ſin; accompanied with a deteſtation of ſin, and of ourſelves on account of it. With this act of the mind, it is ſaid, that repentance, properly ſpeaking, begins.

Some of the Romiſh doctors avow, notwithſtanding the practice of their church, that contrition is valid, and carries with it every thing neceſſary to obtain pardon, without the ceremony, or as they call it, the *ſacrament* of confeſſion and abſolution.

And in this they make the difference between contrition and Attrition (which ſee) to conſiſt. This doctrine was maintained by F. Seguenot upon St. Auguſtine; but it was cenſured by the faculty of Paris.

CONTROL. See Comptrol.

CONTROLLER. See Comptroller.

CONTROLES, Fr. the ſame as Muster-rolls, or Registry-books; which ſee.

CONTROLEUR *General d'Artillerie*, controller general of artillery. This appointment was of an old ſtanding in France, and was next to that of grand maſter or maſter general of artillery, except that of *garde general d'artillerie*. It was however ſuppreſſed, and in 1703 Louis XIV. created two offices in lieu of it, *viz.* that of directors general of artillery, and that of commiſſary general of powder and ſalt-petre. But by his declaration of the 21ſt July 1716, he ſuppreſſed theſe offices, and ſeveral others, and attached to that of controller general all the ancient functions, which that officer afterwards exerciſed in their full extent, and which had been eſtabliſhed by the edicts and declarations of Francis I. and his ſucceſſors.

It is an office of great military importance, and much reſponſibility. He has a number of commiſſaries paid by the ſtate to act and manage under him, by his orders, and in his name. They aſſiſt at the various proofs of powder and pieces of ordnance, and can take and demand an account of the purchaſes made in their abſence by the principal officer of artillery.

Controleurs *Provinciaux d'Artillerie*, provincial controllers of artillery. Theſe officers in France uſed to control all the expences and purchaſes in general, of whatever kind they might be, that concerned the artillery, and could refuſe or reject the arms, ammunition, and in ſhort every thing that proved defective, on the deliveries of articles purchaſed or contracted for. They have each of them a key of the magazines where they reſide. And upon entering on the exerciſe of their office, they cauſed inventories to be given to them by the *gardes-magazins* of every article in them, of which they made a regiſter, and on it added the receipts, returns, and expenditures of ſtores, that they might be always able to render an account to the controller general, and the commandants of artillery. They often made their viſits, and chiefly at the ſame time that the commandants of artillery made theirs. They gave certificates of the dead and wounded, and made an inventory and ſale of the effects of the dead, with the concurrence of the commiſſaries, or the *major des equipage*.

Controleur *General de depenſes de l'Artillerie*, controller general of the expences of the artillery. Theſe officers kept regiſters or accounts of the receipt and expenditure in money which was made by the treaſurer general of artillery, as well as of the receipt and expenditure of pieces of ordnance, ammunition, and of purchaſes.

Controleurs *des Guerres*, war-controllers. The functions of a *controleur des guerres* are to keep a regiſter and control of the muſters and reviews of troops. See the article Muster-masters.

Controleurs *d'Artillerie*, controllers of artillery. See the article Controleurs *Provinciaux d'Artillerie*.

Controleur *General des Vivres*, controller general of proviſions. The undertakers uſed to chooſe for this employment an old commiſſary who was perfectly acquainted with the buſineſs, and was a perſon deſerving of confidence. He had a very extenſive commiſſion for inſpecting and taking cognizance of every thing that concerned proviſions; and the exerciſe of his duty was conſidered as conſiſting of two parts; namely, that he ſhould in the firſt place make himſelf properly acquainted with the ſtate of the magazines that were to ſupply the army, and in the ſecond place accompany the director general of proviſions, to whom he was ſubordinate when he ſhould take the field.

The firſt thing which the controller-general of proviſions uſed to do, was to make a liſt or ſtatement of all the places that depended on him, and of the commiſſaries who did duty there. He inquired what were their functions, into their character for zeal and ſpirit, the extent of their genius, their capacity, what offices they had been employed in, what families they were of, or had, the places of their birth, their age, and their manners.

He examined if the regiſters of the magazines were in proper form, both as to receipts and expenditures, and expences; as to the receipts, if the quantity in them is well ſpecified, the quality, the different names of the meaſures, the weights of the country reduced to avoirdupoiſe weight, in caſe it ſhould be different; if the name of the ſeller, the place of his abode, and the date of the purchaſe, are ſet forth in the article.

As to the expence, he examined what ſupplies the commiſſary had ſent to the magazines, or procured, the nature of the grain and flour, the quantities, and the copies of letters of carriage of the articles ſent. After taking an extract of the receipts and expences, he ſaw what remained in the magazine, he himſelf counted the ſacks, and made a certified ſtate of the whole to be given to him.

The duties of this office, in ſhort, were ſo many and troubleſome, that if this officer, who, we have already obſerved, was ſubordinate to the director general of proviſions, literally fulfilled them, he could not have had ſo much as one day of reſt or repoſe during the whole continuance of a campaign. See Commissary-general *of Stores*.

Controleur *des Hoſpitaux Militaires*, controller of military hoſpitals. Whenever a ſick or wounded perſon enters an hoſpital, this officer writes upon a regiſter endorſed and marked by a commiſſary of war, the military appellation or deſignation of the perſon ſick or wounded, the name of his family, the place of his nativity, and the city neareſt to that place. He makes alſo two ſtatements of his money and his effects, one of which ſerves as an *etiquette au paquet*, or ticket to the parcel or packet, and the other is returned to the ſick or wounded man, in caſe of whoſe death an account is rendered to the major of the regiment to which he belonged.

For the moſt part, however, the undertakers are the heirs or inheritors, for after a year and a day no part of either can be demanded from them.

This officer ſigned the billets of ſoldiers when they entered an hoſpital, and made them report themſelves to him when they went out. He obliged the overſeers of infirmaries to render him an account of the dead immediately after their deceaſe, that he might take them off from his regiſter. In hoſpitals where there was no controller, every thing now mentioned was executed by the director.

CONTROVER, in *Law*, a perſon who of his own head deviſes or invents falſe or feigned news. 2 Inſt. 227.

CONTROVERSIAL Divinity. See Polemical *divinity*.

CONTROVERSY, or Cause, *State of a*, among *Ancient Rhetoricians*, denotes the principal point in diſpute between contending parties, upon the proof of which the whole cauſe or controverſy depends. Ancient writers have expreſſed it by ſeveral other names, as "the conſtitution of the cauſe," "the general head," and "the chief queſtion." (Quint. Inſt. Orat. l. iii. c. 6.) As this is the principal thing to every controverſial diſcourſe, it alſo requires the primary conſideration of the ſpeaker, and ſhould be well fixed and digeſted in his mind, before he proceeds to inveſtigate arguments for its ſupport. See Antony's account of his own method of pleading, in Cic. de Orat. l. ii. c. 27. Quintilian (Inſt. Orat. l. iii. c. 6.) deſcribes the ſubject of this article to be "that kind of queſtion which ariſes from the firſt conflict of cauſes." In judicial caſes, it immediately ſucceeds the charge of the plaintiff, and plea of the defendant. Our common law expreſſes it by one word, *viz.* the Issue: which ſee. This interpreters explain by deſcribing it to be "that point of matter depending in ſuit, upon which the parties join, and put their cauſe to the trial." Thus, in the cauſe of Milo, the charge of the Clodian party is, "Milo killed Clodius." Milo's plea or defence is, "I killed him, but juſtly." Hence ariſes the grand queſtion, or "ſtate of the cauſe;" "whether it was lawful for Milo to kill Clodius?" That Clodius was lawfully killed by Milo is what Cicero, in his admirable oration, in defence of Milo, principally endeavours to prove. The whole of his diſcourſe is to be conſidered as centering at laſt in this point. Again, in the caſe of Roſcius, the charge made againſt him is "that he killed his father." But he denies the fact. The grand queſtion therefore to be argued is; "whether or not he killed his father?" Cicero's deſign in his defence of him is to ſhew, that his accuſers had not made good their charge.

Beſides the principal queſtion, there are ſubordinate queſtions that occur in the courſe of a diſpute, which ſhould be carefully diſtinguiſhed from it: and more particularly that, which ariſes from the reaſon or argument alleged in proof of the principal queſtion. Thus, in the cauſe of Milo, his argument is, "I killed Clodius juſtly, becauſe he aſſaſſinated me." Unleſs the Clodian party be ſuppoſed to deny this, they give up their cauſe. Hence therefore a ſubordinate queſtion ariſes; "whether Clodius aſſaſſinated Milo?" Cicero ſpends much time in the proof of this, as the hinge, on which the firſt queſtion, and conſequently the whole cauſe depended. But whatever may be the number of ſubordinate queſtions, they are all dependent upon the firſt; and though each of them has its particular ſtate, yet neither of theſe is what the rhetoricians call "the State of the Cauſe," which is to be underſtood only of the principal queſtion. Beſides theſe ſubordinate queſtions, incidental ones are often introduced, having ſome reference to the principal queſtion and contributing towards the proof of it, though they are not neceſſarily connected with it, or dependent upon it. Each of theſe has its "ſtate," though different from that of the "cauſe." Many queſtions of this ſort occur in Cicero's defence of Milo, occaſioned by aſperſions that had been thrown out by the Clodian party to the prejudice of Milo. To each of theſe Cicero replies, before he proceeds to the principal queſtion. And therefore, though the queſtion, in which the "ſtate of a Controverſy" conſiſts, is ſaid by Quintilian to ariſe from the "firſt conflict of cauſes," yet we find from the inſtance of Cicero, now adduced, that it is not always the firſt queſtion in order, upon which the orator treats. It ſometimes happens, that the ſame cauſe or controverſy comprehends more than one ſtate. Thus in judicial cauſes, every diſtinct charge occaſions a new ſtate. All Cicero's orations againſt Verres relate to one cauſe, founded upon a law of the Romans againſt unjuſt exactions, made by the governors of provinces upon the inhabitants; but as that proſecution is made up of as many charges, as there are orations, every charge, or indictment, has its different ſtate. It may be obſerved, that diſcourſes of a deliberative and demonſtrative kind, as well as judicial, are managed in a controverſial way; and all controverſies have their "ſtate." And therefore Quintilian very juſtly obſerves (Inſt. Orat. l. iii. c. 6.) that "ſtates belong both to general and particular queſtions; and to all ſorts of cauſes demonſtrative, deliberative, and judicial." As to the number of theſe "ſtates," Cicero and Quintilian reduce them to three. "Three things," ſays the latter (Inſt. Orat. l. iii. c. 6.) "may be inquired into in all diſputes; whether a thing is, what it is, and how it is. And this is the method which nature preſcribes. For, in the firſt place, it is neceſſary the thing ſhould exiſt, about which the diſpute is; becauſe no judgment can be made either of its nature or quality, till its exiſtence be manifeſt; which is therefore the firſt queſtion. But though it be manifeſt, that a thing is, it does not frequently appear what it is; and when this is known the quality yet remains; and after theſe three are ſettled, no further inquiry is neceſſary." The firſt of theſe three ſtates is called the *conjectural* ſtate; the ſecond is called the *definitive* ſtate; and the third is called the ſtate of *quality*. The firſt occurs when it is inquired, "whether one perſon killed another?" The ſecond appears in an example of Cicero; "whether to take a ſacred thing out of a private houſe be theft, or ſacrilege?" The third is manifeſt, when the contending parties are agreed both as to the fact, and the nature of it; but the diſpute is, "whether it be juſt or unjuſt, profitable or unprofitable, and the like?" as in the cauſe of Milo. Ariſtotle (De Rhet. l. iii. c. 26.) and from him Voſſius (Inſt. Orat. l. i. c. 6. § 7.) add a fourth ſtate, namely that of *quantity*; *e.g.* "Whether an injury be ſo great as it is ſaid to be?" Quintilian, however, thinks (ubi ſupra) that this may be referred to one or other of the preceding ſtates; ſince it depends upon the circumſtances of the fact, as the intention, time, place, or the like. The importance and uſe of the preceding obſervations require little illuſtration. Whenever a perſon engages in a controverſy, he ought in the firſt place to conſider the main queſtion in diſpute, to fix it well in his mind, and to keep it conſtantly in his view: and it is equally neceſſary for his hearers duly to regard this point, as they will thus be enabled to diſtinguiſh and ſeparate from the principal queſtion what is only incidental, and to obſerve how far the principal queſtion is affected by it; to perceive what is offered by way of proof, and of illuſtration; not to be miſled by digreſſions, but to diſcern when the ſpeaker deviates from his ſubject and when he reſumes it; and ſo to accompany him through the whole diſcourſe and through his whole chain of reaſoning, as to be able to judge, upon the whole, how far his concluſion is fairly drawn from his aſſumed premiſes. A conſtant regard to the ſtate of the cauſe, and principal point in diſpute, is very neceſſary for this purpoſe. Although rhetoricians treat of theſe ſtates only as they relate to controverſies, and become the ſubject-matter of diſpute between differing parties; yet every diſcourſe has one or more principal heads which the ſpeaker chiefly propoſes to prove or illuſtrate. Ward's Orat. vol. i. lect. vi.

CONTUBERNALES Magistratuum, companions of the magiſtrates. Theſe were young men deſtined for civil and military employments, whom the magiſtrates, in the time of ancient Rome, took into their department to be formed under their eyes and in their houſes.

The ſame appellation of *contubernales* was alſo given to ten ſoldiers, who lived in one and the ſame room or under one and the ſame tent.

CONTUBERNIUM, in *Antiquity*, denotes a ſort of connection or cohabitation that took place between male and female ſlaves in the middle ages. Although their maſters or proprietors did not permit them to marry, they were allowed to form this kind of union. This practice ſo much prevailed, that during ſeveral centuries after the barbarous nations embraced Chriſtianity, ſlaves, who lived as huſband and wife, were not joined together by any religious ceremony, and did not receive the nuptial benediction from a prieſt; when this conjunction between ſlaves came to be conſidered as a lawful marriage, they were not permitted to marry without the conſent of their maſter, and ſuch as ventured to do it without obtaining that, were puniſhed with great ſeverity, and ſometimes were put to death.

CONTUCCI, Andrea, in *Biography*, likewiſe called Andrea Sanſovino, from a town in the Tuſcan dominions, which gave him birth in the year 1460. Like Giotto he was the ſon of a ſimple ſhepherd, and, like him, his genius for deſign diſcovered itſelf in childhood, by the drawings which he made in the ſand, and the models which he amuſed himſelf with forming out of clay. Theſe youthful productions were ſeen and admired by Simone Veſpucci, then chief magiſtrate of the town of Sanſovino: he perceived in them the prognoſtics of the future fame of our young artiſt, and obtained the permiſſion of his father to carry him to Florence, where, under the tuition of Antonio Pollajuolo, he made a rapid progreſs, and ultimately became one of the moſt celebrated architects and ſculptors of his age. The chapel of the ſacrament, in the church of Santo Spirito at Florence, although ſmall, is a beautiful ſpecimen of the perfection which he attained in the former art, and is ſo finely put together that it appears as if chiſelled out of one ſtone. By this, and other works, he ſoon acquired an extended reputation; inſomuch, that he was invited into Portugal, where he erected many edifices, and amongſt others a palace with four towers for the king. After nine years reſidence in that country, he returned, loaded with preſents, to Italy, and was employed by Leo X. in many conſiderable works; eſpecially in the ſtatues and baſſo-relievos which ornament the Santa Caſa of Loretto. Several of his other productions in ſculpture are at Rome, particularly two ſepulchres within the choir of the Madonna del Popolo, and a fine group repreſenting St. Anne, Chriſt, and the Madonna, in the church of St. Agoſtino. He died much regretted in the year 1529, at the place of his nativity. Milizia, Mem. degli Architetti.

CONTUMACY, in *Law*, a refuſal to appear in court when legally ſummoned; a diſobedience to the rules and orders of a court having power to puniſh ſuch offence.

The word is uſed in civil as well as in criminal matters; but more rarely in the firſt, wherein the words *default*, and *contempt*, ordinarily ſupply its place: the refunding of the charges of contempt, judged at the hearing, is alſo the penalty of contumacy. In a criminal ſenſe, the contumacious is condemned, not becauſe the crime is proved on him, but becauſe he is abſent.

By the Roman laws, there was no proceſs in caſe of contumacy, during the firſt year of abſence: they only took an inventory of the goods of the fugitive, and if he died in the year, he died *integri ſtatus*; but, after the year was expired, he was deemed culpable.

In England, contumacy is to be proſecuted to outlawry. In France, all contumacies are annulled, if the accuſed make his appearance in five years: if he die in that time, his relations are allowed to purge his memory.

CONTUS, κοντος, in *Antiquity*, a long ſpear, chiefly uſed by the horſe.

CONTUSION, in *Surgery*, a bruiſe, from the Latin *contuſio*. This term is applied to that kind of leſion which is occaſioned by the application of a blunt ſubſtance to the ſurface of the body, with more or leſs violence, but without dividing the ſkin; it is alſo uſed, when any part has been pinched, compreſſed, or [illegible]. The firſt effects of a contuſion are a laceration of [illegible] or [illegible] in the bruiſed part; and its common ſymptoms are ſwelling and inflammation. A violent contuſion occaſions conſiderable lacerations; amongſt the many ſymptoms of which, effuſion of fluids into the neighbouring cellular texture, and even fractures of the bones, are the moſt frequent. (See Ecchymosis and *Contuſed* Wound.) A violent contuſion operates not only upon the part at which it immediately takes place, but alſo upon remote parts of the body; and the leſions thus produced are termed counter-injuries. See Counter-fissure.

The degree of the contuſion does not always depend upon the force which has occaſioned it, but alſo often upon the nature of the parts that have been bruiſed. The contuſion is always violent, when there is a bone in the injured part, which is little covered with fleſhy ſubſtance. In every ſuch caſe of contuſion, inflammation, with all its bad conſequences, is to be apprehended. In healthy perſons, violent contuſions often produce as ſerious conſequences; but in perſons whoſe ſolids are previouſly debilitated, ſlight contuſions frequently produce gangrene and ulceration. Extravaſated fluids, even though in large quantity, are diſcuſſed and reabſorbed, eſpecially when they are ſituated in parts of a looſe ſpongy texture, or where there are many abſorbent veſſels. In the more ſolid parts, for example, in tendinous and aponeurotic parts, ſmall effuſions cannot be diſcuſſed, and when ſituated near to bones, they eaſily give riſe to caries by their preſſure.

With regard to the cure, contuſions frequently occaſion more trouble to the ſurgeon than fractures; according as the operation and counter-operation of the force applied has been more or leſs violent, and alſo according as the patient does or does not give the injured part the requiſite repoſe, which is equally neceſſary in caſes of contuſion as it is in fractures. The ſlighter degrees of contuſion require nothing more than the uſe of external diſcutient and aſtringent remedies; the beſt of which are cold water, wine, brandy, vinegar, and ſolutions of ſal ammoniac, or of alum, or decoction of Peruvian bark, &c. The weakened and ſtretched parts (if there be not much pain or inflammation) may alſo be ſupported by the preſſure of a tight bandage; and when the contuſion is of conſiderable extent, by bandaging the whole limb. When the patient is plethoric, and the bruiſed part is of importance, a vein muſt be opened, or leeches applied to it.

In the more violent degrees of contuſion, the patients require evacuations, eſpecially cooling purgatives frequently repeated. External preſſure and friction, when the extravaſation is conſiderable, will greatly aid its abſorption, and is therefore beneficial. The more important is the bruiſed part, and the more copious the extravaſation, the more aſſiduouſly muſt all theſe remedies be employed; but in leſs extenſive contuſions, the external applications may be ſufficient.

However, the cold fomentations and ſpirituous aſtringents muſt not be applied without proper ſelection. A decoction of diſcutient herbs in wine, or in a mixture of equal parts of wine and water, eſpecially when aponeurotic and tendinous parts have been much injured, produces often the greateſt benefit; and to this may be added alſo ſal ammoniac, when the pain and tenſion have abated. But if the ſkin be abraded, theſe ſaline applications cannot well be employed.

Sometimes the pain increaſes, in ſpite of theſe applications, to ſuch a degree, that emollient cataplaſms and oleaginous frictions become neceſſary: the following method is particularly recommended in ſuch caſes. Rub well the whole bruiſed part, above and below the contuſion, eſpecially below it, with good oil, and then cover the whole with a mixture of olive oil and ſtrong wine-vinegar, formed into a kind of liniment by agitation. This mixture may beſt be applied upon thick lint, wrapped round the whole part; thus, when the ancle has ſuffered the contuſion, a part of the leg and foot muſt be covered with it. Theſe dreſſings are to be renewed twice or thrice a day, till the ſwelling and pain diſappear. The whole part muſt then be frequently rubbed with camphorated ſpirit of wine. When this has been done for about three or four days, a cloth may be applied, ſpread with a thick ointment compoſed of white of egg mixed with crude alum. This may be repeated about three times, with intervals of 12 hours.

The yellow or blue ſpots that remain after the cure of contuſions, may eaſily be made to diſappear, by applying to them a mixture of bran, ſalt, and vinegar, boiled together till the bran has imbibed the fluids.

When the quantity of extravaſated blood is very large, or when it is ſituated in a part where it cannot eaſily be abſorbed, or when it gives riſe to ſymptoms which demand ſpeedy relief, it muſt be immediately evacuated by an inciſion, and the ſore treated like a wound combined with contuſion. The ſame practice muſt alſo be obſerved, when the internal hæmorrhage by which the extravaſation is produced, proceeds from a large veſſel, continues, and requires to be ſtopped by ſome particular applications; or when, beſides the extravaſation, other leſions of the parts are alſo preſent, as, for example, when the bone has been ſhattered. Should there ſtill remain lumps of coagulated blood behind, after the uſe of the diſcutient remedies, theſe muſt alſo be removed by inciſions, if they threaten to produce further miſchief by their preſſure.

Blows and contuſions of the *joints* deſerve particular attention: for in theſe ſituations, eſpecially in the knee joint, they are always dangerous. The conſequences are violent pain and impeded motion; the pain is generally ſevere at firſt, but ſometimes not. In the firſt caſe the ligaments, and in the ſecond the glands, or interior parts, of the joint have been principally affected. In the latter caſe the conſequences are dropſy, or even ſuppuration of the joint, which frequently proves fatal. When the ligaments or other external parts of the joint have been injured, the part muſt be kept quiet, and treated, according to the peculiar circumſtances of the caſe, with the remedies formerly mentioned, but eſpecially we ſhould have recourſe to leeches: it may afterwards be waſhed with ſpirituous and ſaline applications. When the pain has ceaſed, and there remains behind, as often happens, a ſtiffneſs in the part, the ſoap, liniment, and vapour bath may be employed with advantage. Should arthritic affections be ſuperadded, ſpeedy relief muſt be procured, and the dangerous conſequences obviated by cupping, bliſters, friction with flannel, and the internal uſe of camphorated remedies. When the ligaments have been ſtretched and relaxed by a fall, the German ſurgeons apply, with good effect, ſmall bags filled with the warm powder of plaiſter of Paris, mixed with a fourth part of ſal ammoniac and common ſalt.

When the glands, or internal parts of the joint, have been injured, the ſurgeon ought not to intermit the application of appropriate remedies, till the pain has entirely ceaſed; eſpecially repoſe, blood-letting, and cold fomentations. The leſion of a joint, particularly of the knee, by a fall, blow, &c. eaſily gives riſe to a white ſwelling of the part. In ſuch caſes the ſurgeon cannot employ too great care and attention, as the ſymptoms are ſo numerous and diverſified, that it is in vain to expect a fortunate reſult from a careleſs and inert practice.

Internal contuſions are attended, more or leſs, with diſtreſſing and ſerious ſymptoms. If the head be violently contuſed, there is danger leſt the brain ſhould have ſuffered at the ſame time; or leſt the effuſed blood, lying long upon the cranium, ſhould injure the bone by its preſſure, if it be not ſpeedily abſorbed.

When the thorax has been violently contuſed, the heart, lungs, and large blood-veſſels within the cheſt, are liable to partake of the injury; or a rib may be fractured, and may pierce the lungs, ſo as to occaſion alarming conſequences, if not death itſelf.

A general contuſion of the abdomen, or a blow received upon it, may perhaps hurt the liver, ſtomach, uterus, bowels, &c. or may rupture an important blood-veſſel, and thus cauſe the death of the patient by the internal bleeding, inflammation, or ſuppuration.

The judicious ſurgeon will therefore, in ſuch caſes, conſider what internal parts are likely to have ſuſtained an injury, and will adapt his means to the peculiar circumſtances which ariſe. See CONCUSSION, FRACTURE, and HÆMORRHAGE.

CONTWIG, in *Geography*, a ſmall town of France, in the department of Mont Tonnerre, and chief place of a canton in the diſtrict of Deux Ponts, with 780 inhabitants. The canton itſelf is compoſed of 16 communes, and reckons 4114 inhabitants.

CONTY, a ſmall town of France, on the river Seille, in the department of Somme, 12 miles S.E. of Amiens, which formerly gave the title of prince to the ſecond line of the houſe of Bourbon Condé. It has only 759 inhabitants, but is the chief place of a canton, which, in 27 communes, and upon a territorial extent of 220 kiliometres, reckons 9675 perſons, and forms part of the diſtrict of Amiens; 3½ leagues N.N.E. of it.

CONTZ, a ſmall town of France, in the department of Sarre, and chief place of a canton in the diſtrict of Treves. The number of its inhabitants does not exceed 351, and the whole canton has 31 communes, and a population of 4972 individuals.

CONTZEN, ADAM, in *Biography*, a Jeſuit, and native of the duchy of St. Juliers, has been celebrated for his deep knowledge in the learned languages which he taught in the college of Munich, where he died in the year 1635, after having publiſhed "Commentarii in Evangelia in Epiſt. Pauli ad Rom. et ad Corinth." 2 tom. folio. He wrote likewiſe ſome able pieces in defence of the Catholic religion as oppoſed to the Proteſtants. Moreri. Nouv. Hiſt. Dict.

CONVALESCENCE, in *Medicine*, the inſenſible recovery of health; or that ſtate in which, after the cure of a diſorder, the body which has been reduced, has not yet regained its vigour, but begins to reſume its powers. Proper aliments conduce to the re-eſtabliſhment of the languid faculties; but as the tone of the bowels is weakened, the digeſtive faculty is not equal to its office, which is ſhewn by light ſweats over the whole body; and the ſmalleſt exceſs in this reſpect is oftentimes the occaſion of dangerous relapſes. A perſon in this ſtate is like a taper relumined, which the leaſt degree of wind is ſufficient to extinguiſh. Encycl.

CONVALESCENT, recovering or returning to a ſtate of health. In this country hoſpitals are eſtabliſhed in different diſtricts, for the preſervation and recovery of our troops when ill or indiſpoſed. Among others, there is in each diſtrict a convaleſcent hoſpital.

Liſt of convaleſcents, is the return made out by the ſurgeon belonging to a battalion, hoſpital, &c. in order to aſcertain the ſpecific number that may ſoon be expected to be able to do duty.

CONVALLARIA, in *Botany*. Linn. Gen. 425. Schreb. 575. Willd. 649. Gært. 67. Juſſ. 42. Vent. 2. 145. Muguet. Encyc. Claſs and order, *hexandria monogynia*. Nat. Ord. *Sarmentaceæ*, Linn. *Aſparagi*, Juſſ. *Aſparagoides*, Vent.

Gen. Ch. *Cal.* none. *Cor.* monopetalous, bell, funnel, or wheel-ſhaped, ſmooth, more or leſs deeply ſix-cleft; ſegments open or reflexed. *Stam.* Filaments ſix, awl-ſhaped, inſerted into the corolla or the receptacle; anthers oblong, erect. *Piſt.* Germ ſuperior, globular; ſtyle filiform; ſtigma obtuſe, trigonous. *Peric.* Berry globular, ſpotted before it ripens, three-celled. *Seeds* one, two, or more in each cell, one or two of the cells frequently abortive.

Eſſ. Ch. Cor. ſix-cleft. Berry ſuperior, when unripe, ſpotted; three-celled.

* *Corollas bell ſhaped.* Lilium convallium, Tourn.

Sp. 1. C. *majalis*, ſweet-ſcented lilly of the valley. Linn. Sp. Pl. 1. Mart. 1. Poir. 1. Willd. 1. Flor. Dan. tab. 854. Lam. Ill. tab. 248. Eng. Bot. 1035. Gært. tab. 16. fig. 6. (Lilium convallium alpinum & latifolium; Bauh. Pin. 304. Polygonatum; Hall. n. 1241.) "Scapus ſemicylindrical; flowers in racemes, ſomewhat unilateral, nodding." *Root* perennial, matted, creeping. *Leaves* radical, two, on long petioles, elliptical, ribbed, entire, acute; petioles equitant, inveſted with ſcales. *Scapus* extra-foliaceous, ſolitary, erect, ſimple. *Flowers* white, pedicelled, alternate, bracteate, ſweet-ſcented; ſegments recurved; pedicels recurved; ſtamens ſhort; ſtyle club-ſhaped, triangular upwards. *Berry* ſcarlet when ripe. It varies in having broader or narrower leaves. A native of woods, particularly in hilly countries. 2. C. *japonica*, graſs-leaved lilly of the valley. Linn. Jun. Supp. 204. Mart. 2. Poir. 2. Willd. 2. Thunb. Flor. Jap. 139. (Monds. Kæmp. Amœn. with a figure.) "Scapus two-edged; flowers in racemes, unilateral; leaves linear, three times longer than the ſcapus." *Root* perennial, tuberous. *Root-leaves* about ten, two feet long, drawn to a point at the bottom, triangular, ſtriated, bent back. *Scapus* finely ſtriated, ſeven inches long, quadrangular. *Flowers* white; peduncles aggregate, from two to ſix together, from one to four flowered; bracte lanceolate, white, ſhorter than the peduncle; diviſions of the corolla lanceolate, ſpreading. *Berry* blue, about the ſize of a pea, egg-ſhaped. *Seed* ſolitary, filling the berry. There is a variety with leaves about ſeven inches long, twice the length of the ſcapus. A native of Japan, introduced into England in 1784. 3. C. *ſpicata*. Mart. 3. Poir. 3. Willd. 3. Thunb. Jap. 141. "Scapus ſtriated; raceme ſpiked; flowers aggregate." *Root* perennial, fibrous. *Leaves* linear, narrowed towards the baſe, ſomewhat obtuſe, much ſtriated, longer than the ſcapus. *Scapus* from four inches to a foot high, upright, ſimple, angular, ſtriated, ſmooth. *Flowers* violet, cluſtered without order in a ſpike-like raceme; peduncles very ſhort, cylindrical, ſpreading, ſmooth, one-flowered; corolla almoſt globular, ſo deeply divided as to appear ſix-petalled; diviſions egg-ſhaped, obtuſe, concave; filaments inſerted into the germ, Thunb. (receptacle, Poir.); anthers egg-ſhaped, erect, two-celled; germ ſix-ſtriated, ſmooth; ſtyle erect, white, ſhorter than the ſtamens; ſtigma ſimple. *Fruit* not ſufficiently known. A native of Japan, flowering in September.

** *Corollas funnel-ſhaped.* Polygonatum, Tourn.

4. C. *verticillata*, narrow-leaved Solomon's ſeal. Linn. Sp. Pl. 2. Mart. 4. Poir. 4. Willd. 4. Eng. Bot. 128. (Polygonatum; Hall. n. 1244. P. anguſtifolium non ramoſum; Bauh. Pin. 303. Tourn. Inſt. 78. *β*. ramoſum; Bauh. Pin. 304.) "Leaves in whorls." *Root* perennial, fleſhy, creeping. *Stems* two feet high, erect, commonly ſimple, angular, ſmooth, naked near the bottom. *Leaves* three or four in a whorl, five or ſeven at the top of the ſtem, lanceolate, acute, ſeſſile, glaucous underneath; ſtipules none. *Flowers* white, green at the tip; peduncles axillary, ſolitary, ſlender, branched, drooping, two or three-flowered; corolla a little narrowed at the mouth of the tube; diviſions bearded within under the tip, rather obtuſe; ſtamens ſhort, inſerted into the mouth of the tube; ſtyle ſhort. *Berry* globular, blue. There is a branched variety, deſcribed by Cluſius and others as a diſtinct ſpecies. A native of many parts of Europe, of Scotland, but not of England. 5. C. *polygonatum*, angular Solomon's ſeal. Linn. Sp. Pl. 3. Mart. 5. Poir. 5. Willd. 5. Flor. Dan. tab. 377. Eng. Bot. 280. Woodv. Med. Bot. tab. 44. (Polygonatum latifolium vulgare; Tourn. Inſt. 78. Hall. Helv. n. 1242. P. latifolium flore majore odoro; Bauh. Pin. 303. Barrel. Ic. 711.) "Leaves alternate, half-embracing the ſtem; ſtem angular; peduncles axillary, generally one-flowered." *Root* perennial, creeping, fleſhy, full of knots, which, when cut obliquely, are figured with veins, with ſomewhat of the appearance of a ſeal, whence it is ſaid to have obtained the name of Solomon's ſeal. *Stems* ſeveral, a foot and half high, erect, nodding at the top, ſimple, leafy half way down, angular, ſomewhat two-edged, zig-zag, ſmooth. *Leaves* nerved, ſmooth, unilateral. *Flowers* white, with a green line down the ſegments, nodding, ſweet-ſcented: * unilateral on the ſide oppoſite the flowers; peduncles axillary, ſolitary or in pairs, almoſt always one-flowered; corolla oblong, a little narrowed in the middle; diviſions ſpreading, bearded; ſtamens inſerted into the middle of the tube; anthers projecting beyond the baſe of the diviſions; ſtyle half an inch long. *Berry* blue, with three ſeeds. A native of England and other parts of Europe. The root is mucilaginous, and in times of ſcarcity has been made into bread. It has long been employed as a diſcutient poultice to various kinds of tumours, but more particularly to bruiſes, accompanied with extravaſation of blood in the cellular membrane. It is alſo recommended as a coſmetic; and in the time of Galen was uſed by women to remove pimples and freckles of the ſkin. The berries, flowers, and leaves are extremely acrid, and ſaid to be poiſonous; but Poiret has often eaten the young ſhoots in ſpring and found them as tender and wholeſome as thoſe of aſparagus. 6. C. *multiflora*.

flora. Many-flowered or common Solomon's ſeal. Linn. Sp. Pl. 4. Mart. 7. Poir. 6. Willd. 6. Flor. Dan. tab. 152 Eng. Bot. tab. 279. (Polygonatum latifolium maximum; Bauh. pin. 303. Tourn. Inſt. 78. Hall. helv. n. 1243.) "Leaves alternate, embracing the ſtem, ſtem cylindrical; peduncles axillary, many-flowered." *Root* perennial, creeping, fleſhy, knotted. *Stems* two feet high or more, ſimple, leafy, nodding. *Leaves* elliptical, nerved, a little paler than thoſe of C. polygonatum. *Flowers* white, green at the baſe and tip; peduncles ſolitary, about five-flowered; tips of the diviſions of the corolla ſcarcely bearded; ſtamens inſerted into the top of the tube; ſtyle half an inch long. *Berry* blueiſh black. A native of England and other parts of Europe, chiefly in mountainous parts of the country. The root has ſimilar properties to thoſe of the preceding ſpecies; the young ſhoots are likewiſe eſculent. 7. C. *hirta.* Poir. 7. Boſc. act. ſoc. h. nat. Paris. "Leaves alternate, a little embracing the ſtem; ſtem hiſpid; peduncles with about three flowers." *Root* ſpreading. *Stem* about a foot high, crooked, angular, ſprinkled with white ſtiff hairs. *Leaves* egg-ſhaped, broad, ending in a long obtuſe point; nerves of the inferior ſurface hairy. *Flowers* nodding, unilateral; peduncles axillary, about an inch long, villous. A native of North America, introduced into the Paris garden in 1789. 8. C. *latifolia.* Mur. ſyſt. veg. 334. Mart. 6. Poir. 8. Willd. 7. Jacq. Auſt. 3. tab. 232. "Leaves alternate, embracing the ſtem, acuminate; ſtem angular; peduncles axillary, many-flowered." This ſpecies has the habit of C. multiflora, the flowers of C. polygonatum, and the leaves of C. majalis. *Root* ſmall, ſpreading, fleſhy, very mucilaginous. *Stem* a foot and a half or two feet high, cylindrical at the baſe, then angular to the ſummit. *Leaves* egg-ſhaped, much nerved, quite entire; nerves of the under ſurface ſlightly villous when viewed through a lens. *Flowers* three times larger than thoſe of C. multiflora, white, green at the top, and marked lengthwiſe with greeniſh lines, nodding; peduncles ſlightly villous; ſtamens attached to the middle of the tube. *Berry* globular, blueiſh black. *Seeds* three or four, ſometimes five, in each cell. A native of Auſtria, on woody mountains.

*** *Corollas wheel-ſhàped.* Smilaces, Tourn.

9. C. *racemoſa.* Linn. Sp. Pl. 5. Mart. 8. Poir. 9. Willd. 8. Bot. Mag. tab. 899. (Polygonatum racemoſum; Corn. Canad. 36. tab. 37. Pluk. Alm. 301. tab. 311. fig. 2.) "Leaves ſeſſile; raceme terminal, compound." Linn. "Leaves alternate, ſeſſile, egg-ſhaped, acuminate; panicle terminal, naked." Wiilld. *Stem* two or three feet high, ſtiff, angular, flattened, zig-zag. *Leaves* nerved, thin, flexible, green on both ſides, ſlightly ciliated at the edges. *Flowers* white, very ſmall, on ſmall alternate branches, with ſhort peduncles; corolla open, divided almoſt to the baſe; diviſions egg-ſhaped, a little ſhorter than the ſtamens; anthers large, yellowiſh. *Berries* ſmall, red. A native of North America, called Oiole Nowote, child's phyſic, by the Cherokee Indians. It is a hardy perennial, eaſily propagated by parting the roots, but thrives moſt in a light ſoil and ſhady ſituation. 10. C. *ſtellata.* Linn. Sp. Pl. 6. Mart. 9. Poir. 10. Willd. 9. (Polygonatum virginianum. Moris. hiſt. 3. tab. 4. fig. 7. P. canadenſe; Corn. Canad. tab. 33.) "Leaves embracing the ſtem, numerous." Linn. "Leaves alternate, embracing the ſtem, elliptical, ſomewhat acute; raceme terminal, ſimple." Willd. *Root* white, ſpreading horizontally. *Stem* about two feet high, thick, not angular, weak, almoſt hollow within. *Leaves* growing very near together, large, even ſurfaced, ſmooth, ſlightly ciliated, green on both ſides. *Flowers* white, in a cloſe ſpike; corolla large, open, ſtellate, divided almoſt to the bottom; ſegments linear, obtuſe, ſtamens half the length of the corolla; filaments capillary; anthers yellow, ſmall, roundiſh; ſtyle the length of the ſtamens; ſtigma obtuſe. *Berries* red. A native of North America. 11. C. *trifoliata.* Linn. Sp. Pl. 7. Mart. 10. Poir. 11. Willd. 10. (C. floribus racemoſis, foliis ovatis oblongis; Gmel. Sib. 1. tab. 6.) "Leaves embracing the ſtem, in threes; raceme terminal, ſimple." *Root* perennial, long, jointed, knotty, with ſhort ſlender filaments at each joint. *Stem* about three or four inches high, ſlender, crooked. *Leaves* generally three together, oblong, rarely lanceolate, rather acute, even-ſurfaced, ſmooth, nerved, green on both ſides. *Flowers* ſmall, on long ſimple peduncles; corolla open, deeply divided; diviſions ovate-acute; ſtamens very ſhort, inſerted into the receptacle; germ roundiſh. *Berries* red, round. *Seeds* two or three, yellowiſh, compreſſed, pointed. A native of the foreſts in Siberia. 12. C. *biſolia.* Linn. Sp. Pl. 8. Mart. 11. Poir. 12. Willd. 11. Flor. Dan. tab. 291. Bot. Mag. Pl. 510. (Lilium convallium minus; Bauh. pin. 304. Barrel. Icon. 1212. Unifolium; Hall. helv. n. 1240.) "Leaves heart-ſhaped; flowers tetrandrous." *Root* perennial, ſmall, fibrous, creeping. *Root-leaves* ſolitary, on long petioles, ſpringing from diſtant parts of the root. *Stem* from a different part of the root, two or three inches high, ſlender, ſlightly angular. *Stem leaves* generally two, petioled, a little nerved, heart-ſhaped, acute, with two rounded lobes and ſome ſtiff hairs at the baſe. *Flowers* white, ſmall, ſhorter than the peduncles; peduncles very ſlender, quite ſimple, ſometimes two together, from the axil of a ſmall ſcale at their baſe; corolla deeply four-cleft; diviſions oval, open; ſtamens four; filaments long; anthers ſmall, ſhorter than the corolla; ſtyle ſhort, thick; ſtigma ſlightly bifid or trifid. *Berries* red, ſmall, two or three-celled. A native of the mountainous parts of Europe, abundant in Sweden. Poiret obſerves that the petioled leaves are a rare ſingularity in the family of the Liliaceæ.

Propagation and Culture.—The lilly of the valley requires a looſe ſandy ſoil and a ſhady ſituation. It is propagated by parting the roots in autumn, placing the ſets a foot aſunder. This ſhould be done every third or fourth year; their flowers will elſe be ſmall and few. All the ſorts of Solomon's ſeal are hardy. They prefer a light ſoil and ſhady ſituation, and are proper to ornament plantations which are not crowded with ſhrubs. They are propagated in the ſame manner and require the ſame treatment as the lilly of the valley. Miller.

CONVENÆ, in *Ancient Geography*, a people of Gaul, who derived their name from the Latin *convenire.* They were eſtabliſhed by Pompey, after his return from the Spaniſh war, againſt Sertorius, at the foot of the Pyrenées. Their country is Cominges.

CONVENT, from the Latin *conventus, meeting*, of *convenire, to come together*; a monaſtery of religious, of either ſex. See Monastery.

Convents are very numerous in Greece, as well as in many Popiſh countries; and they are generally, though not univerſally, ſanctuaries conſecrated to ignorance, ſuperſtition, and moſt frequently to ſloth. In the Grecian iſlands, the monks are denominated *caloyers*, from καλος, *kalos*, good, and γέρος, *geros*, old man, *q. d.* good old man. However, the Grecian convents are the habitations, not merely of old men, but of young boys, from 10 to 12 years of age, cloathed in the habit, which conſiſts of a plain long black gown, confined by a girdle.

CONVENTA Pacta. See Pacta.

CONVENTI, Giulio Cesare, in *Biography*, a Bologneſe ſculptor, who is ſpoken of in high terms by Malvaſia, in his deſcription of the magnificent funeral of Agoſtino Caracci, upon which occaſion Conventi modelled a beautiful figure of virtue, which, with another, perſonifying honour, was repreſented, crowning with laurel, the buſt of the deceaſed artiſt. The celebrated ſculptor, Algardi, received his firſt inſtruction in modelling from this maſter. Malvaſia.

CONVENTICLE, a diminutive of *convent*, denoting, properly, a cabal, or ſecret aſſembly, of a part of the monks of a convent, to make a brigue or party in the election of an abbot.

From the ill uſe of theſe aſſemblies, the word is come into diſrepute; and now ſtands for any miſchievous, ſeditious, or irregular aſſembly. F. Doucine obſerves, the occidentals always eſteemed the fifth general council an unlawful conventicle. The term conventicle is ſaid, by ſome, to have been firſt applied in England to the ſchools of Wickliff; and has been ſince uſed to ſignify the religious aſſemblies of all in this country, who do not conform to the eſtabliſhed doctrines and worſhip of the church of England.

Conventicle, however, in ſtrict propriety, denotes an unlawful aſſembly; and cannot, therefore, be juſtly applied to the legal aſſemblies of proteſtant diſſenters, in places of worſhip certified, or licenſed, according to the requiſitions of law. See TOLERATION.

This term occurs in the ſtatutes 2 Hen. IV. c. 15, and 1 Hen. VI. c. 3; and 16 Car. II. c. 4. (A. D. 1664), which ſtatute was made to prevent and ſuppreſs conventicles. This ſtatute, which was enacted for three years, having expired, was revived A.D. 1670, by 22 Car. II. c. 1. which enacted, that if any perſons of the age of ſixteen years, ſubjects of this kingdom, ſhall be preſent at any conventicle, where there are five or more aſſembled, they ſhall be fined 5*s*. for the firſt offence, and 10*s*. for the ſecond; and perſons preaching incur a penalty of 20*l*. for the firſt, and 40*l*. for the ſecond offence. Alſo, ſuffering a meeting to be held in a houſe, &c. is liable to 20*l*. penalty. Juſtices of peace, on the oath of two witneſſes, or any other ſufficient proof, may record the offence under their hands and ſeals, and this record ſhall be taken in law for a full and perfect conviction, and ſhall be certified at the next quarter-ſeſſions. They, and alſo conſtables, head-boroughs, &c. have power to enter ſuch houſes, and ſeize perſons aſſembled, &c. And if they neglect their duty, they ſhall forfeit 100*l*. And if any conſtable, &c. know of ſuch meetings, and do not inform a juſtice of peace, or chief magiſtrate, &c. he ſhall forfeit 5*l*.

"One clauſe in this act," ſays Mr. Hume (Hiſt. vol. vii. p. 457,) "is remarkable; that if any diſpute ſhould ariſe with regard to the interpretation of any part of the act, the judges ſhould always explain the doubt in the ſenſe leaſt favourable to conventicles; it being the intention of parliament entirely to ſuppreſs them. Such was the zeal of the commons, that they violated the plaineſt and moſt eſtabliſhed maxims of civil policy, which require, that in all criminal proſecutions, favour ſhould always be given to the priſoner." The perſecution under this act continued to be very ſevere, till the operation of the act was ſuſpended by the exerciſe of a diſpenſing power, and the king's declaration of indulgence, A. D. 1671–2. However, alderman Love, member for the city of London, in the name of the diſſenters, diſavowed the diſpenſing power, though it had been exerciſed in their favour, becauſe, as he declared in his ſpeech, "he had rather go without his own deſired liberty, than have it in a way ſo deſtructive of the liberties of his country, and the proteſtant intereſt; and this (he ſaid) was the ſenſe of the main body of diſſenters." At length it was ordained, by the ſtat. 1 W. & M. ſt. 1. c. 18. that proteſtant diſſenters ſhall be exempted from penalties; though if they meet in a houſe with the doors locked, barred, or bolted, ſuch diſſenters ſhall have no benefit from that ſtatute. By ſtat. 10 Anne, c. 2. officers of the government, &c. preſent at any conventicle, at which there ſhall be ten perſons, if the royal family be not prayed for in expreſs words, ſhall forfeit 40*l*. and be diſabled. See NONCONFORMISTS and TOLERATION.

CONVENTION, in our *Law-Books*, is uſed when a parliament is called, which ſits and is diſſolved without any act paſſed, or judgment given. It is then ſaid not to be a *ſeſſion* of parliament, but a *convention*. See CONVENTION *infra*.

CONVENTION *of Rouen*, the ſame with burſe of Rouen.

CONVENTION, a treaty, contract, or agreement between two or more parties. See CONTRACT.

Every convention between men, provided it be not contrary to honeſty, and good manners, produces a natural obligation, and makes the performance a point of conſcience.

Every convention has either a name, and a cauſe or conſideration, or it has none: in the firſt caſe, it obliges civilly and naturally; in the latter only naturally.

CONVENTIONS *entre ſoverains pour reſtitution des deſerteurs*, conventions among ſovereigns for reſtitution of deſerters. By theſe ſorts of *conventions*, the deſerters from all armies are taken up or arreſted, if they get into the territories of a power, that is in agreement with that whoſe colours they have deſerted. Notice is given to the neareſt commandant, who ſhould ſend people to find the deſerters at the expence of the corps, and ſhould pay thoſe who took them up, for their ſuſtenance or ſupport during the time of their detention.

CONVENTION *ſecrètes entre les officers d'un corps*, ſecret conventions among the officers of a corps. See CONCORDAT.

Secret conventions are alſo made in a treaty of peace, reciprocally agreed on, and concluded between the parties, who have received powers to treat. Then theſe conventions remain ſecret and concealed, till what was agreed on between the treating and contracting parties is put in execution.

CONVENTION is much uſed both in ancient and modern pleadings, for an agreement or covenant,

In the book of rolls of the manor of Hatfield in Yorkſhire, we have a record of a pleaſant convention, anno 11 Edw. III. between Robert de Roderham, and John de Ithen; the latter of whom ſold the devil in a ſtring for three-pence halfpenny to the former, to be delivered on the fourth day after the convention; when, the purchaſer making his demand, the ſeller refuſed to give him livery, to the great loſs (as the record repreſents it), of forty ſhillings to the purchaſer, &c. But it appearing to the court, that ſuch a plea does not lie among Chriſtians, the parties were adjourned to hell for judgment.

CONVENTION is alſo the name given to an extraordinary aſſembly of parliament, or of the ſtates of the realm, held without the king's writ. Of this kind was the parliament which reſtored Charles II. This parliament met above a month before his return, the lords by their own authority, and the commons, in purſuance of writs iſſued in the name of the keepers of the liberty of England, by authority of parliament; and ſat full ſeven months after his reſtoration, and enacted ſeveral laws ſtill in force.

The neceſſity of the caſe, in this inſtance, ſuperſeded all law; for if they had not ſo met, it was morally impoſſible that the kingdom ſhould have been ſettled in peace. After the king's return, the firſt thing that was done, was to paſs an act, declaring this to be a good parliament, notwithſtanding the defect of the king's writs. (Stat. 12 Car. II. c. 1.) Nevertheleſs, though the king himſelf, who alone had a right to object, conſented to wave the objection, it was at that time a great doubt among the lawyers (1 Sid. 1.) whether even this healing act made it a good parliament, and held by very many, ſays judge Blackſtone, in the negative: though, as he adds, it ſeems to have been too nice a ſcruple. And yet, out of abundant caution, it was thought neceſſary to confirm its acts in the next parliament, by ſtatute 13 Car. II. c. 7. & c. 14.

The convention of eſtates, in 1688, after the retreat of king James II. upon mature deliberation, came to a concluſion, that king James, by his practices here, and his flight hence, had abdicated the kingdom; and that the throne was vacant; and therefore devolved to king William and queen Mary. Upon this their aſſembly expired as a convention, and was converted into a parliament.

In this caſe, the lords and commons, by their own authority, and upon the ſummons of the prince of Orange (afterwards king William) met in a convention, and therein diſpoſed of the king and the kingdom. On this occaſion, the peers and biſhops, to the number of near 90, addreſſed the prince, deſiring him to ſummon a convention by circular letters. In order to ſatisfy his mind by a more general and expreſs declaration of the public conſent, the following judicious expedient was adopted. All the members who had ſitten in the Houſe of Commons during any parliament of Charles II., were invited to meet; and to them were added the mayor, aldermen, and fifty of the common council of London. This was regarded as the moſt proper repreſentative of the people that could be ſummoned during the preſent emergency. They unanimouſly voted the ſame addreſs with the lords. The prince, being thus ſupported by all the legal authority which could poſſibly be obtained in this critical conjuncture, wrote circular letters to the counties and corporations of England, and his orders were univerſally complied with. Accordingly, the Engliſh convention was aſſembled, June 22, 1689, and a vote was paſſed in a few days by a great majority of the commons, and ſent up to the peers for their concurrence. The words which expreſſed it were theſe, "that king James II. having endeavoured to ſubvert the conſtitution of the kingdom, by breaking the original contract between king and people; and having, by the advice of Jeſuits, and other wicked perſons, violated the fundamental laws, and withdrawn himſelf out of the kingdom, has abdicated the government, and that the throne is thereby vacant." (See Abdication.) The vote was carried to the upper houſe, and there met with great oppoſition. After long debate, and free conference between the houſes, and after having obtained the ſentiments of the prince, with regard to the ſettlement of the government, the chief parties agreed, and the convention paſſed a bill; in which they ſettled the crown on the prince and princeſs of Orange; the ſole adminiſtration to remain in the prince: the princeſs of Denmark to ſucceed after the death of the prince and princeſs of Orange; her poſterity after thoſe of the princeſs, but before thoſe of the prince by any other wife. The convention annexed to this ſettlement of the crown, a declaration of rights, where all the points which had of late years been diſputed between the king and people, were finally determined; and the powers of royal prerogative were more narrowly circumſcribed, and more exactly defined, than in any former period of the Engliſh government. See Constitution.

This convention was aſſembled upon a ſimilar principle of neceſſity with that of the reſtoration; that is, upon a full conviction, that king James had abdicated the government, and that the throne was thereby vacant; which ſuppoſition of the individual members was confirmed by their concurrent reſolution, when they actually aſſembled. In ſuch a caſe as the palpable vacancy of the throne, it follows "*ex neceſſitate rei*," that the form of the royal writs muſt be laid aſide, otherwiſe no parliament can ever meet again. Let us ſuppoſe, for the ſake of argument, that the whole royal line ſhould at any time fail, and become extinct, which would indiſputably vacate the throne; in this ſituation, it ſeems reaſonable to preſume, that the body of the nation, conſiſting of lords and commons, would have a right to meet and ſettle the government, otherwiſe there muſt be no government at all. Upon this, and no other principle, ſays judge Blackſtone, did the convention in 1689 aſſemble. The vacancy of the throne was precedent to their meeting, without any royal ſummons, not in conſequence of it. They did not aſſemble without writ, and then make the throne vacant; but, the throne being previouſly vacant by the king's abdication, they aſſembled without writ, as they muſt do if they aſſembled at all. Had the throne been full, their meeting would not have been regular; but, as it was really empty, ſuch meeting became abſolutely neceſſary. Accordingly, it is declared by ſtatute 1 W. & M. ſt. 1. c. 1. that this convention was really the two houſes of parliament, notwithſtanding the want of writs, or other defects of form.

A ſimilar convention, by circular letters from the prince, was ſummoned at Edinburgh, on the 22d of March 1689. As ſoon as the purpoſe of this convention was diſcovered, the earl of Balcarras, and viſcount Dundee, leaders of the tories, withdrew from the city; and the convention having paſſed a bold and deciſive vote, that king James, by his mal-adminiſtration and abuſe of power, had *forfeited* all title to the crown, they made a tender of the royal dignity to the prince and princeſs of Orange.

The conſtitution of Great Britain having placed the repreſentation of the nation, and the expreſſion of the national will in the parliament, no other meeting or convention, even of every individual in the kingdom, would be a competent organ to expreſs that will; and meetings of ſuch a nature tending merely to ſedition, and to delude the people into an imaginary aſſertion of rights, which they had before delegated to their repreſentatives in parliament, could only tend to anarchy and confuſion; and to overturn every ſettled principle of government.

Accordingly, an act of parliament was paſſed in Ireland, in the year 1793, to prevent any ſuch meetings or conventions; and a few ignorant individuals, who in the ſame year had dared to aſſemble under that title in Scotland, were quickly diſperſed, and their leaders convicted of ſeditious practices; for which they were ſentenced to tranſportation.

CONVENTIONAL Estates *for Life*, are thoſe that are expreſsly created by the acts of the parties, in contradiſtinction to ſuch as are merely *legal*, or enacted by conſtruction and operation of law. See Estate.

Conventional *Subrogation*. See Subrogation.

CONVENTIONARY Rents, in *Rural Economy*, is a term which is ſometimes applied to the reſerved rents of life leaſes. See Lease.

CONVENTIONE Facienda, in *Law*, is a writ which lies for the breach of any covenant in writing. Fitzherbert calls it a writ of *covenant*.

CONVENTUAL, ſomething belonging to a convent. See Coenobite.

Conventual is particularly uſed, ſince the year 1250, for a religious who actually reſides in a convent; in contradiſtinction to thoſe who are only gueſts, or are entertained there, or are in poſſeſſion of benefices depending on the houſe.

Conventual likewiſe denotes a claſs of the order of Franciſcans, who adopted the relaxation introduced into that order by pope Innocent IV. which allowed of property and poſſeſſions in their community. They were ſo called in oppoſition to the "Brethren of the Obſervance." This diviſion took place in the year 1368.

Conventual *Church*, denotes a church that conſiſts of regular clerks, profeſſing ſome order of religion; or of dean and chapter, or other ſocieties of ſpiritual men.

Conventual *Prior*, differs from a *clauſtral prior*, in that the former has the full right and authority of an abbot; the only difference between them being in the name: whereas the clauſtral prior is a dependent of the abbot, and derives all his authority from him.

The conventual prior is obliged to take prieſt's orders in a year, or at moſt in two years, from the day of his admiſſion: in default whereof, the benefice becomes vacant. Some priories are actually conventual, *i. e.* they are ſtocked with religious: others are only conventual *in habitu*, *v. gr.* where there have been no religious during the ſpace of forty years: the continuance of one ſingle religious, keeps the priory *conventual actu*; for, in default of one, the priory becomes ſimple. See Prior.

By a declaration of the king of France, in 1680, it was decided, that a conventuality never degenerates, or ceaſes, while there are regular places ſubſiſting in it for twelve religious, with revenues for their ſupport.

Conventual *Auditors*. See Auditor.

CONVERGENCY *of Meridians*, in *Geographical Surveying*, is the angle formed between the meridian of any place and the parallel to the meridian of any other place, drawn through the firſt mentioned place. Thus, if P (*Plate* II. *Surveying*, *fig.* 10.) be the pole of the earth, E Q a portion of the equator, P E a meridian drawn through a place or ſtation G, and P Q a meridian drawn through another place R: then, if G R be a portion of a great circle paſſing through the places G and R, and *a b* be a portion of a ſmall circle paſſing through G, parallel to the meridian of R (P Q), or perpendicular to the great circle *p* R, which is itſelf a perpendicular to the meridian P Q, in the point R, then is the angle *a* G P the angle of convergency of the two meridians P G and P R, at the place G. It is to be obſerved, that at the equator any two meridians, as E P and Q P, are parallel to each other; but on their departure from thence, they converge more and more as they approach towards the pole, where the angle of convergency (*a* G P) becomes equal to the angle of longitude E P Q. It may alſo be remarked, that the angle of convergency, augmented by the exceſs of the three angles of a ſpherical triangle above 180°, is equal to the angle of longitude at the pole, on a ſphere. Phil. Tranſ. 1787, p. 218. The principles for applying this to an ellipſoid figure of the earth, or to any other given ſpheroid, may be found in Mudge and Dalby's Trig. Survey, vol. i. art. 60, &c.

The late general Roy (Phil. Tranſ. 1787, p. 216.) has explained the mode of applying the convergency of two meridians, obtained by reciprocally obſerving the azimuth of a ſtation on each, from the other, compared with the meridian there (determined by obſervations of the pole-ſtar), to the finding of the difference of longitude, or angle at the pole between the meridians of thoſe two ſtations, by a method ſomewhat different from that recommended by the Rev. Mr. Mitchell. Phil. Tranſ. lvi. In the progreſs of the Government Trigonometrical Survey, this method was firſt applied in the finding of the difference of longitude between Botley Hill ſtation in Surrey (lat. 51° 16′ 41½″ N. and long. 0° 0′ 3″ E. of Greenwich Royal Obſervatory) and Goudhurſt ſteeple in Kent, about 23 miles diſtant; as alſo for ſettling the latitude of the latter place. Phil. Tranſ. 1790, p. 206. It was afterwards applied, in a moſt complete manner, to the determination of the difference of longitude between Beachy Head ſtation in Suſſex (lat. 50° 44′ 23.7″, long. 0° 15′ 11.9″ E.), and Dunnoſe ſtation in the Iſle of Wight, wherein the bearing of each of theſe places, with the meridian of the other, was accurately ſettled by obſervation, although the places are more than 64 miles apart; and whence, the length of a degree of a great circle of the earth, perpendicular to the meridian in latitude 50° 41′, was calculated to be 61182.3 Engliſh fathoms. The latitude of Dunnoſe ſtation, as determined by this operation, has ſince been verified by a ſeries of accurate obſervations, made with a capital zenith ſector, the laſt work of the celebrated Ramſden, and has been found to err only $\frac{9}{10}$ of a ſecond in defect. See Dunnose. This method of determining longitudes of ſtations, by the convergency of meridians, has ſince been applied to finding the longitudes and latitudes of Black-Down ſtation in Dorſetſhire, long. 2° 32′ 22.4″ W. lat. 51° 41′ 14.7″ N. of Butterton ſtation in Devonſhire, long. 3° 52′ 47.5″, lat. 50° 24′ 47.2″, and of St. Agnes Beacon in Cornwall, long. 5° 11′ 55.7″, and lat. 50° 18′ 27.9″. Phil. Tranſ. 1800. But theſe deductions ſeem not to have all the pretenſions to accuracy, of which the method is ſuſceptible, for want of reciprocal obſervations; the three laſt ſtations being ſo choſen as to be all inviſible from each other: and although the firſt of them is viſible from Dunnoſe, that ſtation was not viſited again, for the purpoſe of completing the obſervations; but one of the angles of this, and both the angles of the other two polar triangles, were made to depend on thoſe of the intermediate chains of triangles. It is with the utmoſt regret that we obſerve any opportunities omitted of ſubmitting this grand trigonometrical ſurvey to all the poſſible teſts of its accuracy, or of collecting and recording obſervations, likely to be of future uſe in drawing concluſions relative to the anomalies in the figure of the earth. The writer of this, from having aſſiſted in the making of ſome hundreds of obſervations with the admirable theodolites, which are in the hands of major William Mudge, and his able aſſiſtants employed on the trigonometrical ſurvey, and from having been a witneſs to the great ſkill and pains with which they are always uſed by theſe gentlemen, and from having ſince applied his multiplied obſervations in accurately calculating the ſituation of many different objects, by ſeries of 4 or 5, and in ſome caſes 10 or 12, independent triangles, is enabled to aſſert, that an extreme degree of accuracy in the diſtances and horizontal angles may be obtained in this ſurvey, perhaps unparallelled in any ſimilar undertaking. He laments, therefore, that Ramſden's fine zenith ſector (deſcribed Phil. Tranſ. 1804) ſhould, during any favourable ſeaſon of the year, lie idle in the Tower, inſtead of being employed in determining the actual latitudes, and, with a theodolite, making pole-ſtar obſervations, for obtaining the correct azimuths of all the many principal ſtations, whoſe horizontal bearings and diſtances have been ſo very accurately ſettled in this ſurvey; which does equal honour to the government that patronizes it, and to the gentlemen by whom it is conducted.

CONVERGING CURVES. See CURVE.

CONVERGING, or CONVERGENT *Lines*, in *Geometry*, are thoſe which continually approximate, or whoſe diſtance becomes continually leſs and leſs: in oppoſition to *divergent* lines, whoſe diſtance becomes continually greater. Lines that converge one way, diverge the other.

CONVERGING *Rays*, in *Dioptrics*, are thoſe rays which in their paſſage out of one medium into another, of a different denſity, are refracted towards one another; ſo that, if far enough continued, they will meet in a point, or focus.

All convex lenſes make the rays converge, and concave ones diverge, *i. e.* the one inflects them towards a centre, and the other deflects them from it; and the more, as ſuch lenſes are portions of ſmaller ſpheres. On which properties, all the effects of lenſes, microſcopes, teleſcopes, &c. depend.

Rays coming converging out of a denſer medium into a rarer, become more convergent, and concur ſooner than if they were to continue their motion through the firſt. Rays coming converging out of a rarer into a denſer medium, converge leſs, and concur later, than if they had continued their motion through the firſt medium.

Parallel rays, paſſing from a denſer into a rarer medium, *v. gr.* from glaſs into air, the ſurface of the glaſs being towards the air, will become convergent, and concur in a focus.

Diverging rays, or rays coming from a point, under the ſame circumſtances, become converging, and meet in a focus; and as the radiant point comes nearer, the focus recedes farther off: if the radiant be near, the focus will be infinitely diſtant; *i. e.* the rays will be parallel: and if the point be brought nearer ſtill, the rays will diverge.

CONVERGING *Series*, in *Mathematics*. See SERIES.

CONVERSANO, in *Geography*, a town of Italy, in the kingdom of Naples, and province of Bari; the ſee of a biſhop, ſuffragan of Bari; 15 miles E.S.E. of it.

CONVERSATION, DISCOURSE; theſe two words denote an interlocution between two, or among more perſons: with this diſtinction, that the converſation is uſed for any general intercourſe of ſentiments whatever; whereas a diſcourſe means a converſation limited to ſome particular ſubject. Thus we ſay, a converſable man; meaning a man able to converſe on a variety of ſubjects, or a man of general knowledge; but we do not ſay a diſcourſable man. The word diſcourſe is generally uſed when we mention a ſuperior talking to an inferior.

CONVERSATION *Point*, in *Geography*, a head-land on the ſouth ſide of a bay on the coaſt of California. N. lat. 32° 30′. W. long. 119°.

CONVERSAZIONES, denote evening aſſemblies held at Rome, where perſons of both ſexes met, not for inſtructive or even amuſing converſation, but in order to ſee and pay tranſient compliments to one another; and where a perſon may enjoy the happineſs of being ſqueezed and preſſed among the beſt company in the city. Several of theſe take place in the ſame evening, and they are formed by the paſſing viſits of the ſame perſons, who thus ſeek amuſement by a mere change of place and company. Theſe aſſemblies generally break up about 9 o'clock; a ſmall party excepted, who are invited to ſupper. They reſemble our modern *routs*. Moore's View of Society, &c. in Italy, vol. i. p. 337, &c.

CONVERSE, in *Geometry*, *&c.* A propoſition is ſaid to be the converſe of another, when, after drawing a concluſion from ſomething firſt ſuppoſed, we proceed to ſuppoſe what had been before concluded, and to draw from it what had been ſuppoſed. Thus, it is demonſtrated in geometry, that if the two ſides of a triangle be equal, the two angles oppoſite to thoſe ſides are equal alſo: the converſe of the propoſition is, that if the two angles of a triangle be equal, the two ſides oppoſite to thoſe angles are equal alſo.

CONVERSE *Direction*, in *Aſtrology*, is uſed in oppoſition to *direct* direction, *i. e.* by the latter, the promoter is carried to the ſignificator, according to the order of the ſigns: but by the former it is carried from eaſt to weſt, contrary to the order of the ſigns.

CONVERSERA, in *Geography*, an iſland of the Adriatic, near the coaſt of Iſtria. N. lat. 45° 20′. E. long. 18° 44′.

CONVERSION, in a *Moral Senſe*, a return from evil to good; reſulting from a ſenſe, either of the natural deformity of the one, and amiableneſs of the other: or of the advantages and diſadvantages that ſpring from the one and the other, reſpectively.

Or, it is the change of the heart, with regard to the morals, paſſions, deſires, and purſuits; and of the mind, with regard to the ſentiments, &c. See REGENERATION. For an account of the converſion of St. Paul, conſidered as an argument for the truth of Chriſtianity, ſee PAUL.

CONVERSION, in *Law*, is where a perſon having the goods of another in his poſſeſſion, converts them to his own uſe, without conſent of the owner; for which the proprietor may maintain an action of trover and converſion againſt him.

This action of trover and converſion was, in its original, an action of treſpaſs upon the caſe, and a recovery of damages againſt the offender, from which it derived its name. Refuſal to reſtore goods is, *primâ facie*, ſufficient evidence of a converſion, though it does not amount to a converſion. 10 Rep. 56. See TROVER.

CONVERSION, *Converſio*, in *Logic*, a circumſtance or affection of propoſitions, wherein the order of the terms, or extremes, is changed; ſo that the ſubject comes into the place of the predicate, and the predicate into that of the ſubject; without any alteration in the quality of either.

As, "No virtue is vice; No vice is virtue:" in which we ſee the ſubject of the former, made the predicate of the latter, and the predicate the ſubject; yet both true.

Converſion is uſually defined a due change of the order of the extremes, *i. e.* under ſuch a habitude and coherence with reſpect to each other, that the one is rightly inferred from the other.

Hence, in every legitimate converſion, two things are required: 1. A communication, or reciprocation of terms; not in reſpect of words, but of order. 2. The inference of one propoſition to the other.

Ariſtotle makes two kinds of converſion; the one *ſimple*, by others called *univerſal;* wherein nothing is changed beſide the order of extremes, *i. e.* the terms are tranſpoſed, without altering either the quality or quantity thereof: as, "No mind is body; No body is mind."

The ſecond, *per accidens*, called alſo *particular;* wherein, beſide changing the places of the terms, there is a change of an univerſal ſign into a particular one; as, "Every good man ſtudies the welfare of his country; ſome man that ſtudies the welfare of his country is good."

To theſe, ſome of Ariſtotle's followers add a third kind of converſion, called *by contrapoſition:* as, "Every man is an animal; every no-animal is no-man."

Conversion, in *Rhetoric, &c.* is underſtood of arguments which are returned, retorted, and ſhewn on oppoſite ſides, by changing the ſubject into the attribute, and the attribute into the ſubject.

There are converſions of arguments, from one figure to another, and alſo from general propoſitions to particular caſes. Thus Cicero againſt Antony: "Doletis tres exercitus P.R. interfectos? Interfecit Antonius. Deſiderates clariſſimos cives? Eoſque vobis eripuit Antonius. Auctoritas hujus ordinis afflicta eſt? Afflixit Antonius."

Conversion, in *War*, denotes a military movement or manœuvre, which turns the front of a battalion, where the right or left flank was, when either flank is attacked.

Conversion *of Diſeaſes.* A diſeaſe is ſaid to be converted, when new ſymptoms ariſe in its progreſs, which require a different deſignation, and which either put a period to the original diſorder, or, combining with it, alter the phyſician's views reſpecting the prognoſtics, or the method of cure. Many inſtances of this kind are familiar; as the converſion of intermittents into continued fevers, or obſtructions of the viſcera; of hœmoptöe into phthiſis; of jaundice into dropſy, and the like. Others are more unuſual, and unexpected, and deſerve to be noticed, becauſe they occaſion much perplexity in practice, when they occur, and eſpecially as this ſubject has been much overlooked by medical writers.

We owe the firſt obſervation on the ſubject of converſion, to Hippocrates, and his annotators. Hoffman has curiouſly touched on it, in his ſhort diſſertation *de morborum tranſmutatione*. Baglivi, though very deſirous that it ſhould be treated at length, and though liberal in promiſes of aſſiſtance, confines his recital of facts in a great meaſure to thoſe of Hippocrates. An expreſs treatiſe was written on the ſubject by Rodericus à Caſtro, under the quaint title of *Quæ ex Quibus*, a work better conceived than executed. And an excellent eſſay was more recently publiſhed by Dr. Ferriar, of Mancheſter, in the 2d vol. of his "Medical Hiſtories and Reflections," in which the ſubſtance of this article will be found.

This ſubject was formerly arranged under two diviſions: when the original diſeaſe ſubſiſted after the acceſſion of the ſecond, it was termed a caſe of *epigeneſis*, or *propagation*; when the ſecond diſeaſe put a period to the firſt, it was called an inſtance of *metaptoſis*, *metaſtaſis*, or *tranſlation*. But this is a looſe diſtinction, which excludes many caſes of converſion. The chief difference between the *metaptoſis* and *epigeneſis* is, that the relation of the ſucceſſive morbid appearances, and their dependence upon each other, cannot be ſo clearly perceived in one caſe as in the other. It would have been more uſeful, to have diſtinguiſhed converſions by their influence on the event of the diſeaſe; as ſome are dangerous, and generally fatal; others, while they terminate the original diſorder, conduce to a more ſpeedy reſtoration of health. Thus, when a continued fever ſupervenes to pneumonic inflammation, the patient is in great danger, it is *gravi malo grave malum accedere;* when a diarrhœa ſupervenes to continued fever, in certain ſtages, it terminates the fever earlier than the regular courſe of the diſeaſe could have done.

All caſes of converſion may perhaps be conveniently referred to the following heads. 1. The ſupervening diſeaſe may be produced by the remote cauſes of the original diſorder: in this caſe, the action of thoſe cauſes, after producing its firſt effect, is prolonged ſo as to excite a new train of ſymptoms. 2. The ſupervening diſeaſe may ariſe from the exceſs or combination of the ſymptoms of the original complaint. 3. The ſtate of the habit, produced by the firſt diſeaſe, may give riſe to a new diſorder. 4. Converſion may happen, from the imprudent ſuppreſſion of habitual diſeaſes.

I. The application of certain remote cauſes, may be ſufficiently powerful to produce a freſh diſeaſe, after the firſt has been brought on by their action. It is common to find pneumonic inflammation ſupervene to typhus, by a continuance of the application of cold or dampneſs, which operates as a remote cauſe of the fever. On the contrary, from the tendency of the ſyſtem to inflammation, or from the manner in which cold has been applied, the pneumonic ſymptoms precede the fever in ſome caſes, and even run their courſe, before the fever aſſumes a regular form. In a fatal caſe of the converſion of pleuriſy into typhus, the left lobe of the lung was deſtroyed by ſuppuration. (Lieutaud. Hiſt. Anat. Med. tom. i. Obſ. 378.) I have ſeen, ſays, Dr. Ferriar, a caſe of peripneumonia notha end in typhus, and the typhus in mania. He alſo relates, chiefly from his own obſervation, the converſion of acute rheumatiſm into typhus in the firſt week, a circumſtance which we have alſo witneſſed;—the converſion of the mild ſynochus, or typhus, into inflammation of the peritoneum, or villous coat of the inteſtines;—of cholera into typhus;—of dyſentery and diarrhœa into continued fever;—of hyſteria into epilepſy and inſanity, &c.; changes which are not very unfrequent.

Caſes of hyſterical converſions, which belong to the head, are very common ſources of error to young practitioners, and ſometimes deceive even the moſt experienced. Sydenham long ago enumerated an ample catalogue of the diſeaſes, the ſymptoms of which the maniac, hyſteria, frequently aſſumes. This maſterly eſſay, with which Dr. Ferriar appears to have been unacquainted, contains a full diſcloſure of the converſions of this diſorder. The ſymptoms of apoplexy, paralyſis, epilepſy, cough, the iliac paſſion, jaundice, ſtone in the kidneys, and in the bladder, vomiting, diarrhœa, rheumatiſm, lumbago, &c. have been terminated by the acceſſion of a complete hyſterical paroxyſm. (See Hysteria.) "We are ignorant," ſays Dr. Ferriar, who has deſcribed a ſimilar variety of hyſterical converſions, "by what laws the body poſſeſſes a power of repreſenting the moſt hazardous diſorders, without incurring danger; of counterfeiting the greateſt derangement in the ſyſtem, without materially altering its movements; of producing madneſs, conſcious of its extravagancies, and of increaſing the acuteneſs of ſenſation, oppreſſing the common ſenſorium. In hyſterical affections, all theſe appearances are excited, which are incompatible with the reaſonings of every ſyſtem-maker, who has yet endeavoured to explain the inexplicable. Nature, as if in ridicule of the attempts to unmaſk her, has, in this claſs of diſeaſes, reconciled contradictions, and realized improbabilities, with a myſterious verſatility, which inſpires the true philoſopher with diffidence, and reduces the ſyſtematic to deſpair."

II. The ſymptoms of an idiopathic diſeaſe may, by their violence, aſſume the appearance, and require the attention due to a new complaint; or affections of particular viſcera, which, in their incipient ſtate, are only regarded as ſymptoms of general indiſpoſition, may, as they gain ground, extinguiſh the original diſeaſe, or be protracted beyond it. This head comprehends ſuch a variety of caſes, that to treat it fully, would be to give the hiſtory of all ſymptomatic diſeaſes. A few illuſtrations will ſuffice.

Dr. Percival mentions, that he had ſeen an effuſion into the cavities of the brain, produced by the ſucceſſions of coughing, in a confirmed pulmonary conſumption, which effuſion terminated fatally, with a previous ſuppreſſion, more than a week before death, of all the pulmonic ſymptoms.

It is one of the moſt perplexing occurrences in medicine, when the ſupervening diſeaſe is produced by a ſymptom of ſome latent complaint: when, for example, phthiſical ſymptoms ariſe in a ſcrofulous or gouty patient, who exhibits, at firſt, no other appearance of thoſe two diſeaſes. Dr. Ferriar ſaw an inſtance, in which all the characters of confirmed phthiſis pulmonalis were preſent, that terminated in recovery, upon the patient's coughing up ſome ſolid particles, which, upon examination, proved to be chalk-ſtones. Dr. Percival relates, that a gentleman of rank was ſuppoſed to be in an advanced ſtate, of what is called a galloping conſumption, having an inceſſant cough, an expectoration apparently purulent, continued heats, and night ſweats: yet his cure was accompliſhed by giving wine-whey copiouſly, and by adminiſtering doſes of hartſhorn and ſpermaceti. A gentle fit of the gout was produced by this cordial regimen. The fever, cough, and ſpitting, were progreſſively diminiſhed, and the health of the patient was ſoon perfectly re-eſtabliſhed.

There is, indeed, a ſtrong reſemblance between hyſteria and gout, in the power of counterfeiting different diſeaſes, but with this material diſtinction; that the hyſterical repreſentations are commonly void of danger, while thoſe produced by gout are often more dangerous than the ſimple diſorder which they imitate. The hyſterical hæmoptöe, for example, is ſeldom productive of bad conſequences, but the arthritic apoplexy, pneumonia, and cardialgia, are much more alarming, and run their courſe quicker than ſimilar complaints originating from other cauſes. But theſe diſeaſes agree in this reſpect, that the acceſſion of the regular paroxyſm puts a favourable period to the irregular ſymptoms.

The prognoſtics, in converſions of this ſecond claſs, muſt evidently vary according to the ſeat and degree of the ſupervening diſeaſe, and its favourable action upon the original diſorder.

III. The original diſeaſe, if acute, when it has run its uſual courſe, may leave the habit in a ſtate favourable to the production of another diſeaſe: or if the original be a chronic diſorder, ſuch a ſtate of the habit may take place during its continuance, and the acceſſary diſeaſe may be ſimply ſuperadded, or it may vary the form, or affect the duration of the former.

Continued fevers are converted into different diſeaſes, the production of which admits one general explanation. During the increaſed action of the circulating ſyſtem, if any part of the body be originally weak, or have been rendered infirm and irritable by preceding diſeaſe, congeſtion, and its conſequences, may be expected there. It is therefore eaſy to conceive, why one patient ſhould ſuffer a paralytic affection, another phthiſis, or a third nephritis, in conſequence of tedious caſes of typhus. The glandular ſuppurations, conſequent on fevers, ſeem to depend on the ſame principle; for although they are repreſented as critical, by the older medical writers, we ſometimes ſee ſtriking proofs of the contrary. The exanthemata are frequently converted into diſeaſes, which become both chronic and dangerous. The ſmall-pox often produces ſevere coughs, diarrhœa, and ophthalmia. In ſome rare inſtances, tumours of the joints ſupervene, which ſuppurate and deſtroy the patient. The pneumonic inflammation attending the meaſles, is too often converted into phthiſis pulmonalis. Glandular ſwellings, and general dropſy, frequently ſucceed the ſcarlatina anginoſa. There is a curious caſe in Dr. Percival's Eſſays, Medical and Experimental, (vol. i. p. 148.) of a woman, in whom a converſion of fever took place, firſt into palſy, afterwards into epilepſy, and then into amauroſis. Fevers often terminate in hyſterical diſorders, eſpecially in women. Nephritis alſo is a common converſion of fever: it ſeldom ſupervenes with conſiderable violence, excepting in perſons who have formerly undergone it; but when it has been familiar to the patient, a very large quantity of gravel is commonly paſſed, with extraordinary pain in the ſtate of converſion. The acceſſion of nephritis always extinguiſhes the fever. Other converſions of fever have been noticed, ſome of them peculiar to certain epidemics.

Various inſtances of converſion of diſeaſes, under this head, may be found in the writings of phyſicians. Jaundice is ſaid, by Baglivi, to be converted to tympanites; tympanites, by Dr. Ferriar, to diarrhœa and iſchuria; dyſpeptic complaints of long ſtanding, to general dropſy; aſcites to chronic inflammation of the bowels, and diarrhœa, which generally prove fatal; mania, as obſerved by Dr. Mead, to fatal epilepſy; and alſo to a cutaneous eruption, with recovery; &c. &c.

IV. Converſions may ariſe, when a diſeaſe, regular in its uſual courſe, or long familiar to the habit, is violently terminated by improper methods, or ſuddenly extinguiſhed by accidental circumſtances.

Thus epileptic fits have been produced by the retroceſſion of the itch, in conſequence of ſome external application; the epilepſy having reſiſted all the uſual methods of treatment, was only cured by producing the itch. Inſtances of the production of melancholy and madneſs, by the ſuppreſſion of eruptions, or the healing of old ulcers, and habitual drains, are common in practical writers.

The diſeaſes originating from the ſuppreſſion of the menſtrual and hæmorrhoidal diſcharges are alſo well explained in different books. Dr. Hoffman's treatiſe, *De Morborum tranſmutatione*, relates almoſt entirely to this claſs of diſorders. Tedious dyſpeptic caſes are often converted to cutaneous eruptions, in diſtinct pimples, of a fiery red colour; ſuch eruptions extinguiſh the complaint in the ſtomach. Examples of converſions might be multiplied infinitely: but we muſt here content ourſelves with adverting to the important concluſions, reſpecting the prognoſtics and cure of diſeaſes, which may be drawn from an obſervation of thoſe phenomena. The following moſt obvious deductions have been pointed out and illuſtrated by Dr. Ferriar.

1. Whenever local inflammation ſupervenes to an acute diſeaſe, it ſhortens or extinguiſhes the original diſorder. The danger, or ſalubrity of this converſion, appears to depend greatly on the nature of the part attacked by inflammation. In fever, for inſtance, if it be a conglobate, or conglomerate gland, the prognoſis will be favourable, but if the brain, the pleura, or the peritoneum, be inflamed, the danger is increaſed. In the former caſe, the cure of the fever may be in a great meaſure truſted to the ſupervening diſeaſe; in the latter, the progreſs of the inflammation will demand our chief attention. Thus, however, contra-indications will be avoided, and the ſafety of the patient will be better conſulted, than by the temporizing practice uſually adopted on ſuch occaſions.

This deduction ſerves alſo to explain the action of bliſters, which, by producing local inflammation, imitate the proceſs, and, in proportion to their action, exhibit the effect of this kind of converſion. It explains alſo the ſalubrity of the gouty inflammation, when it ſeizes a part not neceſſary to life.

2. It is ſo far certain, that medicines operate by producing converſions, that we perceive very conſiderable diſeaſes reſulting from the uſe of certain remedies, ſuch as mercury; and we judge of the extinction of the original complaint, in ſome meaſure, by the increaſe and permanency of the

remedial diſeaſe. Thus when we give diuretics, or cathartics, we endeavour to excite a diſeaſe in the inteſtines, or kidneys; for an extreme increaſe of natural action, in any part, is certainly morbid. In like manner, Dr. Darwin has obſerved, that ſome derangements of mind cannot be removed, without exciting an artificial delirium.

3. The convulſion denominated hyſterical, when it ſeizes the muſcular fibre, in caſes of converſion, is always ſalutary, and may be regarded, in many inſtances, as the criſis of chronic diſorders.

4. Internal inflammation, ſupervening to chronic diſeaſes, has a leſs tendency to extinguiſh the original complaint, than a ſimilar converſion of acute diſorders, and is equally dangerous.

5. Cutaneous eruptions often extinguiſh dangerous diſeaſes. Excepting the regular exanthemata, ſuch converſions ſeldom happen in acute diſorders. But madneſs and melancholy, epilepſy, delirium, protracted after fever, dyſpepſia, various pulmonary affections, are all obſerved to be mitigated, or removed, on the appearance of cutaneous diſorders; eſpecially on the return of thoſe, which, after becoming familiar, had been ſuddenly ſuppreſſed.

6. As it appears that many converſions are proceſſes, conſtituted by nature for the cure of diſeaſes, and that ſome of the moſt active remedies operate in a ſimilar manner, we may not only improve the hiſtory of diſeaſes, but the practice of medicine, by paying cloſer attention to the connection and operation of diſorders upon each other. With this view of the ſubject, the moſt complicated caſes will admit an inſtructive developement, and every additional fact may find an uſeful place. See Metastasis.

Conversion *of equations*, in *Algebra*, is when the quantity ſought, or any part thereof, being in fractions, the whole is reduced to one common denomination; and then, omitting the denominators, the equation is continued in the numerators only.

Thus, ſuppoſe $a-b=\frac{aa+cc}{d}+h+b$; multiply all by d, and it will ſtand thus, $da-db=aa+cc+dh+db$.

In arithmetic, we uſe the term *proportion by converſion of ratio*, for a compariſon of the antecedent, and conſequent, in two equal ratios.

Thus, as there is the ſame ratio between two and three, as between eight and twelve; it is concluded there is the ſame ratio between two and one, as between eight and four.

Or, according to Euclid (lib. v. Def. 17.), it is the inference, in the caſe of four proportionals, that the firſt is to its exceſs above the ſecond, as the third is to its exceſs above the fourth.

E.G. If we have - - - - - - 8 : 6 :: 4 : 3.
Then convertendo, or by converſion, 8 : 2 :: 4 : 1.
Or, if we have - - - - - - - - $a : b :: c : d$.
Then convertendo - - - - - - $a : a-b :: c : c-d$.

Conversion, *Centre of.* See Center.

CONVERSOS. See Convert.

CONVERT, a perſon who has undergone Conversion.

Convert is chiefly uſed in reſpect of changes from one religion, or religious ſect, to another.

Converts with relation to the religion turned to, are denominated *apoſtates* with regard to that they have relinquiſhed.

The Jews formerly converted to Chriſtianity in England, were called *converſos*. Henry III. built them a houſe in London, and allowed them a competent ſubſiſtence for their lives; which houſe was called *domus converſorum*. But the number afterwards increaſing, they became a burthen to the crown; upon which they were diſtributed among the monaſteries: and after the expulſion of the Jews under Edward III. the *domus converſorum* was given for keeping of the rolls.

Converts, in a *Monaſtic Senſe*, are lay-friars, or brothers, admitted for the ſervice of the houſe; without orders, and not allowed to ſing in the choir.

Till the eleventh century, the word was uſed for perſons who embraced the monkiſh life at the age of diſcretion; by which they were diſtinguiſhed from thoſe devoted in their childhood by their parents, called *oblati*.

But in the eleventh century, when they began to receive into monaſteries illiterate perſons, incapable of being clerks, and only deſtined for bodily labour; the ſignification of the word was neceſſarily changed. F. Mabillon obſerves, that it was John, firſt abbot of Vallombroſa, who firſt introduced theſe *brother-converts*, diſtinguiſhed by their ſtate from the monks of the choir, who were then either clerks, or capable of becoming ſo.

CONVERTIBILITY *of elements* into one another. See Elements.

Convertibility *of ſpirits* into one another. See Spirits.

CONVERTIBLE Husbandry, in *Agriculture*, is that ſort of farm-management in which the land is cultivated, under the alternate ſyſtems of tillage and graſs.

The lands which are the moſt proper for this kind of huſbandry are thoſe in which the ſoil is of the more dry and friable deſcription, and in which there is a diſpoſition to take on or produce graſs. Wet clayey ſoils are conſidered by Mr. Davis as wholly unfit for this ſort of management. All the loamy ſorts of land which are capable of producing good turnips, and the rich ſandy ſoils, are particularly ſuited to this method of huſbandry. And on many other varieties of land it may be had recourſe to with conſiderable benefit and advantage, where proper care is taken in the cultivation; but it is unqueſtionably a mode of culture which ſtands in need of great attention, in order to conduct it in the moſt proper and beneficial manner, both for the land and the farmer.

It has however been obſerved by Mr. Nairmith, in his "Elements of Agriculture," that "though it were poſſible to make drill culture univerſal, and cultivate the whole country like a garden, it is doubtful if it would be provident. It is to be feared that it would be ſomething like the conduct of a perſon who conſumes part of his capital yearly, along with his annual revenue. Whatever may be ſaid to the contrary, all ſoils certainly ſuffer ſome degree of deterioration by long, unremitted tillage. When diveſted of that cloathing with which nature always defends it if undiſturbed, and when turned up naked to abide the force of the blaſt, the happy medium of conſiſtence is deranged, its beſt particles carried away in torrents; and it is left a feeble ſkeleton, poſſeſſing only the faint ſemblance of departed fertility. This is ſtrongly exemplified, he ſays, in the once fertile iſland of Barbadoes, in the Weſt Indies. It has been ſaid that this iſland, no doubt ſomewhat hyperbolically, ſince it began to be cultivated by the Europeans, has loaded more veſſels with produce than would have been ſufficient to have carried away the whole iſland; and now, it is reported, that the ſoil is ſo exhauſted, that no kind of culture or manure can reſtore its fertility. We have correſpondent accounts from the county of Norfolk, and other diſtricts, where unceaſing tillage has been practiſed: the ſpecies of crop which has been moſt run upon is now leſs productive than formerly. In ſhort, there are numerous inſtances within the perſonal knowledge of many, that wherever the ground has been long dunged and laboured for cropping, without reſt, though the crops may be as bulky, they are generally leſs productive than they were at an earlier period.

“ Convertible huſbandry, or regular alternations of tillage crops and paſtures, ſeem therefore, he ſays, to be the only ſyſtem by which the fertility of the country can be preſerved and improved. The proviſions of a country are not derived from tillage crops alone. A conſiderable proportion is obtained from the dairy and the ſhambles. Contraſts have been made to ſhew the vaſt diſproportion between the quantity of food obtained from any given extent of land in a cultivated crop, and what the ſame extent of paſture yields. But it ſhould be remembered, that the fertility of a cultivated field is often acquired by its having lain in paſture. The quantity of food from cultivated crops is not always in proportion to the extent of the land cultivated. The county of Ayr, in the weſt of Scotland, contains, he ſays, a great deal of good ſoil. It is not much more than forty years ſince he remembers the inhabitants of that county paſſing in crowds with horſes, pack-ſaddles, and empty bags, to the Eaſt, to bring peaſe and barley, of which they made a kind of bread to ſerve them in ſummer. At that time the farmers were under no reſtraint as to the proportion of their farms, which they might have in tillage. Soon after, a gentleman who had the management of a great eſtate in that county, made a regulation in the leaſes, by which the farmers were bound to have never more than a third of their farms in tillage. Other proprietors adopting the ſame regulations, it became general: and the farmers were afterwards reſtricted to plough no more than one fourth. Of late, this county, though not leſs populous than formerly, ſends always a great deal of grain to the neighbouring diſtricts; and inſtead of empty bags and pack-ſaddles, ſends carriages loaded with cheeſe to Leith, to be ſhipped for London. Thus by laying land which has been in tillage, frequently in paſture, the future fertility of the country is enhanced, and its preſent produce is not diminiſhed.

“ But it has been ſtated, he remarks, from high authority, that there is nothing more difficult than to bring old tillage lands to produce good paſture. A perſon who has been in the habit of attending to the culture of the fields, will have ſome difficulty in comprehending this poſition. He will have obſerved, that when the ſeeds of any of the graſſes are permitted to vegetate on land which has been long under tillage culture, they grow with remarkable luxuriancy, if they be not overwhelmed by the growth of weeds in their infancy. If his experience has been of a long ſtanding, he will remember the introduction of clover and rye-graſs into this country, and will recollect that the firſt time theſe ſeeds were ſown on old tillage lands, the crops of graſs were generally more weighty than any that have ſucceeded on the ſame ground. Having found ſuch grounds ſo much diſpoſed to produce graſs, he will be at a loſs to conceive why they ſhould not produce good paſture. As graſs ſeeds vegetate beſt on ground which is of a pretty ſolid conſiſtence, they will ſometimes fail, when the texture is too looſe, unleſs that fault has been remedied by early ploughing, or by ſufficient rolling, or both. But the beſt native *gramina* (graſſes), having numerous fibrous roots, extending horizontally, are not eaſily ejected, after they have gained ſtrength, and become unfailing. In the inſtances which have given riſe to the above poſition, the ground muſt not, he thinks, have been ſtocked with thoſe perennial plants proper to compoſe a good paſture. In a long courſe of tillage, the ſeeds and roots of the native graſſes are worn out and baniſhed: the plants introduced from artificial hay frequently fail in a few years; and the ground is left naked, or ſtocked only with ſuch coarſe weeds as have kept footing in the ground, or had their ſeeds carried there by winds and birds. But to make tillage grounds bear ſtanding paſture, they ſhould be ſtocked with the ſeeds of ſuch indigenous perennial plants as are known to be adapted to that purpoſe.

“ The chief of which are, he ſays, *anthoxanthum odoratum, lolium perenne,* and *alopecurus pratenſis,* for ſpring paſture, to be followed by *cynoſurus criſtatus, poa trivialis,* &c. The leguminous plants for paſturage, he adds, are of the genus *trifolium,* the *pratenſe,* the *repens,* the *lupulinum,* and the *procumbens*; of the genus *vicia,* the *cracca* and *ſepium,* the *lathyrus pratenſis,* &c. If lands which have been long in tillage are ſtocked with the ſeeds of theſe, and care taken not to ſuffer the young plants to be overwhelmed by rank weeds before they get themſelves eſtabliſhed in the ground, all difficulties will be overcome, and ſuch grounds will be found to yield the moſt ſubſtantial and unfailing paſture.

“ As all vegetables are compoſed of the ſame elements, and nouriſhed by the ſame kind of juices, it may appear ſomewhat unphiloſophical, in a ſpeculative view, to maintain that the fertility of the ſoil is preſerved by cultivating one ſpecies of plants upon it one year, or ſeries of years, and plants of a different ſpecies and quality the following.

“ But it is a generally received aphoriſm, he obſerves, that nature delights in variety, and this aphoriſm is ſupported by experience in this as well as in other reſpects. Some kinds of vegetables extend their roots near the ſurface, others penetrate deeper into the ſoil, ſome by overſhadowing the earth with their broad leaves render it ſoft and mellow; others, whoſe naked ſtalks admit the free circulation of the air, conſolidate the ſoil; ſome derive the greateſt part of their nouriſhment from the juices lodged in the earth; others draw a conſiderable proportion from the atmoſphere; ſome, having a longer period of exiſtence, continue long to demand nouriſhment; others arrive more quickly at maturity, and muſt be eaſier ſupported. Beſides, among the various tribes of inſects ſo feeble in themſelves, but ſo formidable and deſtructive by their numbers, each has ſome vegetables which it prefers to others for its food, and reſorts to the places where ſuch food is produced; and as they propagate their kinds where their food is found, they muſt become more numerous, and conſequently more deſtructive, where the cultivation of the ſame plant is often repeated. There are weeds too, he ſays, which bear in this reſpect ſome analogy to thoſe inſects, and as they cannot be at all times fully eradicated, propagate the more, the oftener they meet with the crop moſt agreeable to them. By the effects which the growth of different vegetables produce on the ſoil, the proper medium of conſiſtence is in ſome meaſure preſerved, the vegetable food better huſbanded, and the injuries from noxious inſects and weeds ſomewhat eluded. On all theſe accounts, the maxim of modern agriculturiſts, that crops of a different nature and quality ſhould ſucceed one another, is juſtified.

“ But the arguments in favour of alternations of tillage and paſture, are, he remarks, ſtill more urgent. The derangement of that happy medium between extremes of too great friability and compactneſs, which he has endeavoured to ſhew is eſſential to the general purpoſes of vegetation, is the unavoidable conſequence of long repeated tillage.

“ This is always, he contends, in ſome degree reſtored, when land is left to reſt. If it has been properly treated when in tillage, and well ſtocked with perennial herbage, when left to reſt, it will quickly aſſume a cloſe cover over its ſurface, which, from whatever principle it proceeds, experience has always ſhewn, has a powerful influence in diſpoſing the ſoil to fertility. In this ſtate, the waſhing to which tilſage lands are expoſed in times of rain, is, he ſuppoſes, completely ſuſpended, and the water flows away limpid. While the ground continues covered with a cloſe turf, the root-leaves of the herbage ſpreading over the ſurface, abſorb and digeſt the carbonic acid of the atmoſphere, and perhaps, alſo, earthy particles which probably float continually in the air, as before ſtated. As thoſe leaves are ſmothered and decay, they are perpetually increaſing the ſtock of carbon and vegetable mould. The celebrated Mr. Kirwan, indeed, is, he ſays, of a different opinion. He ſuppoſes, that ground lying in paſture is annually diminiſhing in fertility, though in a leſs degree than that from which a vegetable crop is carried off, becauſe a part is reſtored in the excrements of paſturing animals. But though poor ſoils which are incapable of producing a cloſe turf over their ſurface, gain little by lying at reſt, it is evident, that every ſoil, which either from its natural conformation, or from the improvements made on it by proper culture, has attained a cloſe cover of ſweet herbage, is perpetually gaining. Whenever the temperature is mild, a continual reproduction is taking place; and all the horizontal foliage, which eſcapes the mouths of paſturing animals, falls into decay and accumulates on the ſurface. On breaking up ſuch old paſtures a ſurfaced ſtratum may be obſerved, differing in colour and conformation from that which lies under it, the thickneſs of which is in proportion to the time the ground has lain at reſt. What is here ſtated, is, he thinks, corroborated by the following experiment. Having ſometimes obſerved a kind of turf formed over the hardeſt ſtones in certain ſituations, he collected ſome of it which had grown to more than an inch thick on ſome flat ſtones, lying in a damp place, at the foot of a northerly declivity under ſome trees. It ſeemed to have commenced with the growth of ſome of the ſmaller *muſci* and *algæ*. On this ground the *feſtuca ovina* and *poa glauca* had taken root, and formed a ſtrong turf. After it was dried, he ſubjected a pound of it to combuſtion on an iron ſhovel over a fire till it was reduced to black duſt. The reſidue weighed half an ounce, whereas the greateſt reſidue he ever obtained from a pound of dried peat burnt, was not more than five drams. If ſuch a quantity of mould could thus be accumulated by the graſſes growing on a naked rock, may it not accumulate at leaſt in as great a proportion on the ſoil where the ſucceſſion of growth is incomparably greater?

"It is true, he obſerves, that ſome ſoils by long lying at reſt, condenſe ſo much as to incommode the roots of the graſſes, and on others the moſſes prevail ſo much as to overcome the eſculent herbage, but the fertility of the ſoil is not thereby diminiſhed. Its preſent energy is only ſuſpended, while it is acquiring additional vigour for future exertions. When ſuch land is again employed in tillage, the ſpoils of the turf, together with a great part of what has been conſumed by paſturing animals reſtored in excrements, are turned down and mixed with the ſoil, by which its conformation is improved, and its thickneſs and principle of fertility augmented. Hence the tillage crops are plentiful—the ears large and plump—and the produce of one year equal to two or more on land wearied out by perpetual turning.

"It muſt not be underſtood, by what is here or formerly ſaid, that he means to undervalue the operation of the plough. But, as we are ſtudying in what manner the fertility of the country may be preſerved and improved, and the greateſt quantity of diſpoſable produce obtained at the leaſt poſſible expence, it is neceſſary to examine how all thoſe aids which nature offers may be made to co-operate with the artificial means of agricultural improvement, and not blindly expect from mechanical labour, more than it can poſſibly produce. When barren ſoils are to be brought from a wild ſtate, it is by mechanical labours only that their obſtinacy can be ſubdued, and the different ingredients properly blended. The turf of old graſs ground will frequently require a good deal of mechanical operation to mix it with the earths, and facilitate its putrefaction. But when theſe, and ſuch other aids as mechanical labour is adapted to accompliſh, are obtained, that medium of conſiſtence on which fertility depends will be beſt preſerved by alternate ſucceſſions of labour and reſt. The proportion and order of thoſe ſucceſſions muſt no doubt vary greatly according to circumſtances. While thoſe where the ſoil is deep and of the moſt favourable conſtruction, and where adventitious manure is attainable, may be much occupied in tillage crops, without ſuffering great deterioration; in the more elevated grounds, where the ſoil is generally leſs happily conſtructed, expoſed to ſeverer waſhings and manure leſs abundant, a greater proportion of the farm ought always to be in paſture. But in all ſituations and circumſtances, the ſoil will be benefited by being occaſionally at reſt, provided care has been taken to lay it down unexhauſted, free of weeds, and well ſtocked with proper graſſes. By this ſyſtem of alternations of tillage and graſs crops, the attention of the huſbandman is leſs diſſipated, and his labours more regularly diſtributed. The live ſtock fed on his paſture, furniſh him with manure to enrich his tillage fields, and the more they are enriched, they are the better fitted to yield an abundant return of graſs, when they come in courſe to be laid to reſt. When ground is brought to yield abundance of ſweet graſs it is profitable in paſture, and while it continues ſo is ſtill improving in fertility, and becomes more and more adapted to yield plentiful tillage crops. Thus under good management, the fertility of the country may progreſſively advance, and the diſpoſable quantity of proviſions for the uſe of the conſumer, and the net return to the huſbandman, perhaps, exceed what the operoſe and expenſive ſyſtem of perpetual fallowing, and crops without reſt, could produce.

"Convertible huſbandry is not leſs ſuperior to perpetual graſs. Land which lies perpetually in graſs, is deprived of the advantage of having the vegetable ſubſtance accumulating on the ſurface from time to time mixed into the ſoil. By the working of moles, ants, and other vermin, by the condenſation of the ſoil, by the prevalence of moſſes and uſeleſs weeds, the turf is deformed and the reproduction of ſweet paſture diminiſhed. Water is frequently detained on the ſurface, and chills the growth of eſculent herbage, and thus the growth becomes more feeble and ſlow. In proportion to the decay of eſculent herbage, plants which are noxious or unprofitable prevail; the paſture becomes gradually leſs, and the fertility of the ſoil is almoſt uſeleſs to the owner and to ſociety, while it remains in that ſtate."

The practice of this huſbandry muſt of courſe in many inſtances be highly profitable to the cultivator. See Tillage and Grass.

CONVEX, bending down on every ſide, as the outſide of a globular body.

Convex *freeze*, *leaf*, *lens*, *mirror*, *ſuperficies*. See the ſeveral ſubſtantives.

CONVEXITY, the exterior ſurface of a *convex*, *i. e.* gibbous and globular thing; in oppoſition to *concavity*, or the inner ſurface, when hollow or depreſſed.

The word is of particular import in catoptrics, and dioptrics; where it is applied to *mirrors* and *lenſes*; which ſee. See alſo Refraction.

CONVEYANCE, in *Law*, a deed, or inſtrument, by which lands, &c. are *conveyed*, or transferred, by the proprietor, to ſome other perſon. In the diſcuſſion of this ſubject, it is proper to inquire *who* may thus aliene and to *whom*; and then *how* a man may aliene, or the ſeveral modes of conveyance. With regard to the firſt inquiry, who is capable of conveying and who of purchaſing, the ſubject of conſideration is rather the incapacity, than the capacity, of the ſeveral parties; for all perſons in *poſſeſſion* are *primâ facie* capable both of conveying and purchaſing, unleſs the law hath laid them under any particular diſabilities. But if a man has only in him the *right* of either poſſeſſion or property, he cannot convey it to any other, leſt pretended titles might be granted to great men, by which juſtice might be trodden down, and the weak oppreſſed. (Co. Litt. 214.) Yet reverſions and veſted remainders may be granted, becauſe the poſſeſſion of the particular tenant is the poſſeſſion of him in reverſion or remainder; but *contingencies*, and mere *poſſibilities*, though they may be releaſed, or deviſed by will, or may paſs to the heir or executor, cannot be aſſigned to a ſtranger, unleſs coupled with ſome preſent intereſt. (Sheppard's Touchſtone, 238, 239. 322. 11 Mod. 152. 1 P. Wms. 574. Stra. 132.)

Perſons attainted of treaſon, felony, and præmunire, are incapable of conveying, from the time of the offence committed, provided attainder follows, for ſuch conveyance by them may tend to defeat the king of his forfeiture, or the lord of his eſcheat. But they may *purchaſe* for the benefit of the crown, or the lord of the fee, though they are diſabled to *hold* the lands ſo purchaſed, if after attainder, being ſubject to immediate forfeiture; if before, to eſcheat as well as forfeiture, according to the nature of the crime. (Co. Litt. 42. 2.) Thus alſo corporations, religious or others, may purchaſe lands: yet, unleſs they have a licence to hold in mortmain, they cannot retain ſuch purchaſe; but it ſhall be forfeited to the lord of the fee. Idiots and perſons of non-ſane memory, infants, and perſons under dureſs, are not totally diſabled either to convey or purchaſe, but *ſub modo* only. For their conveyances and purchaſes are voidable, but not actually void. The king indeed, on behalf of an idiot, may avoid his grants or other acts. (Co. Litt. 247.) See Idiot. A feme-covert may *purchaſe* an eſtate without the conſent of her huſband, and the conveyance is good during the coverture, till he avoids it by ſome act declaring his diſſent. And though he does nothing to avoid it, or even if he actually conſents, the feme-covert herſelf may, after the death of her huſband, waive or diſagree to the ſame; nay, even her heirs may waive it after her, if ſhe dies before her huſband, or if in her widowhood ſhe does nothing to expreſs her conſent or agreement. (Co. Litt. 3.) But the conveyance or other contract of a feme-covert (except by ſome matter of record) is abſolutely void, and not merely voidable (Perkins, § 154. 1 Sid. 120.); and therefore cannot be affirmed or made good by any ſubſequent agreement. The caſe of an alien born is alſo peculiar.—For he may purchaſe any thing; but after purchaſe he can hold nothing, except a leaſe for years of a houſe for convenience of merchandize, if he be an alien-friend: all other purchaſes (when found by an inqueſt of office) being immediately forfeited to the king (Co. Litt. 2.). Papiſts, and perſons profeſſing the popiſh religion, and neglecting to take the oath preſcribed by ſtatute 18 Geo. III. c. 60. within the time limited for that purpoſe, are by ſtat. 11 and 12 W. III. c. 4. diſabled from purchaſing any lands, rents, or hereditaments; and all eſtates made to their uſe, or in truſt for them, are void. (1 P. Wms. 354.)

In anſwer to the ſecond inquiry, or *how* a man may aliene or convey, we are led to ſtate the ſeveral modes of conveyance. A tranſlation, or transfer, of property being admitted by law, it became neceſſary that this transfer ſhould be properly evidenced, in order to prevent diſputes as to the fact, or in relation to the perſons concerned, or with regard to the ſubject-matter, or with reſpect to the mode and quality of the transfer. The legal evidences of this tranſlation of property are called the *common aſſurances* of the kingdom. See *Common* Assurances.

Deeds (ſee Deed) which ſerve to convey the property of lands and tenements from man to man, are commonly denominated *conveyances*; and theſe are either conveyances at *common law*, or ſuch as receive their force and efficacy by virtue of the *ſtatute of uſes*. Of conveyances by the common law, ſome may be called *original* or *primary* conveyances; which are thoſe by means of which the benefit or eſtate is created or firſt ariſes; and others are *derivative* or *ſecondary*, by which the benefit or eſtate, originally created, is enlarged, reſtrained, transferred, or extinguiſhed. *Original* conveyances are the following, *viz. Feoffment, Gift, Grant, Leaſe, Exchange*, and *Partition;* which ſee reſpectively. *Derivative* conveyances are *Releaſe, Confirmation, Surrender, Aſſignment*, and *Defeazance;* which ſee under their proper titles. For other conveyances, which have their force and operation by virtue of the *ſtatute of uſes*, which have been derived from it or introduced in conſequence of it; ſee Uses. See alſo Covenant *to ſtand ſeiſed to uſes*, Bargain *and* Sale, Lease *and* Release, and Revocation *of Uſes*.

A conveyance cannot be fraudulent in part, and good as to the reſt: for if it be fraudulent and void in part, it is void in all; and it cannot be divided. 1 Lill. Abr. 311. Fraudulent conveyances to deceive creditors, defraud purchaſers, &c. are void, by ſtatutes 13 Eliz. c. 5. 27 Eliz. c. 4. See Fraud.

CONVICT, in *Common Law*, one who is found guilty of an offence, by the verdict of a jury. This conviction may accrue two ways; either by his confeſſing the offence and pleading guilty; or by his being found ſo by the verdict of his country. Judge Blackſtone ſays, that in the Roman republic, when the priſoner was convicted of any capital offence by his judges, the form of pronouncing that conviction was peculiarly delicate, not that he was guilty, but that he had not been ſufficiently on his guard, "parum caviſſe videtur."

According to Crompton, a perſon is alſo a convict, or ſaid to be convicted, when, after having been outlawed, he appears and confeſſes, or is found guilty by the inqueſt; and he ſays, moreover, that when a ſtatute excludes from clergy perſons found guilty of felony, &c. it extends to thoſe who are convicted by confeſſion. (Cromp. Inſt. 9.)

The law implies that there muſt be a conviction before puniſhment, though it is not ſo mentioned in a ſtatute; and where any ſtatute makes a ſecond offence felony, or ſubject to a heavier puniſhment than the firſt, it is always implied that ſuch ſecond offence ought to be committed after a conviction for the firſt. (1 Hawk. P. C. c. 10. § 9. c. 41. § 3.) Judgment amounts to conviction; though it doth not follow that every one who is convicted is adjudged. A conviction at the king's ſuit may be pleaded to a ſuit by an informer, on a penal ſtatute; becauſe while in force it makes the party liable to the forfeiture, and no one ought to be puniſhed twice for the ſame offence; but conviction may be pleaded to a new ſuit by the king. (1 Hawk. P. C. c. 10.) A perſon convicted or attainted of one felony may be proſecuted for another, to bring acceſſaries to puniſhment, &c. (Fitz. Coron. 379.)

Perſons convicted of felony by verdict, &c. are not to be admitted to bail, unleſs there be ſome ſpecial motive for granting it; as where a man is not the ſame perſon, &c. for bail ought to be before trial, when it ſtands indifferent whether the party be guilty or not. (2 Hawk. P. C. c. 15. § 43, 80.) See Bail. Conviction of felony, and other crimes, diſables a man to be a juror, witneſs, &c. Conviction and attainder, &c. are, in our law-books, frequently confounded. On conviction, (or even upon an acquittal when there was reaſonable ground to proſecute, and, in fact, a *bona fide* proſecution,) for any grand or petit larceny, or other felony, the reaſonable expences of proſecution, and alſo, if the proſecutor be poor, a compenſation for his trouble and loſs of time, are by ſtatutes 25 Geo. II. c. 36., and 18 Geo. III. c. 19. to be allowed him out of the county ſtock, if he petitions the judge for that purpoſe; and by ſtatutes 27 Geo. II. c. 3. explained by the ſame ſtatute 18 Geo. III. c. 19; all perſons, appearing upon recognizance or *ſubpœna* to give evidence, whether any indictment be preferred or not, and as well without conviction as with it, are entitled to be paid their charges, with a farther allowance (if poor) for their trouble and loſs of time. Moreover, on a conviction of larceny in particular, the proſecutor ſhall have reſtitution of his goods, by virtue of the ſtatute 21 Hen. VIII. c. 11. And the conſtruction of this act having been in great meaſure conformable to the law of appeals, it has therefore in practice ſuperſeded the uſe of appeals of larceny. It is now uſual for the court, upon the conviction of a felon, to order (without any writ of reſtitution) immediate reſtitution of ſuch goods as are brought into court to be made to the ſeveral proſecutors, or elſe, without ſuch writ, the party may peaceably retake his goods, wherever he happens to find them, unleſs a new property be fairly acquired in them. Or, if the felon be convicted and pardoned, or be allowed his clergy, the party robbed may bring his action of trover againſt him for his goods, and recover a ſatisfaction in damages. But ſuch action does not lie before proſecution; for then felonies would be made up and healed (1 Hal. P. C. 546.): and alſo recaption is unlawful, if it be done with intention to ſmother or compound the larceny; it then becoming the heinous offence of *theft-bote;* which ſee.

When a perſon is convicted of a miſdemeſnor which principally and more immediately affects ſome individual, as a battery, impriſonment, or the like, it is not uncommon for the court to permit the defendant to *ſpeak with the proſecutor,* before any judgment is pronounced; and if the proſecutor declares himſelf ſatisfied, to inflict but a trivial puniſhment. This is done, to reimburſe the proſecutor his expences, and make him ſome private amends, without the trouble and circuity of a civil action. This, ſays judge Blackſtone, is a dangerous practice, which, though intruſted to the diſcretion of the judges in the ſuperior courts of record, ought never to be allowed in local or inferior juriſdictions, ſuch as the quarter-ſeſſions; where proſecutions for aſſaults are by ſuch means too frequently commenced, rather for private lucre than for the great ends of public juſtice. Above all, he ſays, it ſhould never be ſuffered, where the teſtimony of the proſecutor himſelf is neceſſary to convict the defendant; for there the rules of evidence are entirely ſubverted; the proſecutor becomes in effect a plaintiff, and yet is ſuffered to bear witneſs for himſelf. Nay, even a voluntary forgiveneſs, by the party injured, ought not, in true policy, to intercept the ſtroke of juſtice. "This," ſays an elegant writer (Beccaria, ch. 46.) who pleads with equal ſtrength for the *certainty* as for the *lenity* of puniſhment, "may be an act of good nature and humanity, but it is contrary to the good of the public. For, although a private citizen may diſpenſe with ſatisfaction for his private injury, he cannot remove the neceſſity of public example. The right of puniſhing belongs not to any one individual in particular, but to the ſociety in general, or the ſovereign who repreſents that ſociety; and a man may renounce his own portion of this right, but he cannot give up that of others." Blackſt. Comm. Book iv.

Convict *recuſant,* he who has been legally preſented, indicted, and convicted, for refuſing to come to church to hear the common prayer, according to the ſtatutes 35 Eliz. and 3 Jac. I.

This is commonly underſtood to be a popiſh recuſant; though any others who refuſe coming to church on the ſame account are as properly denominated recuſants.

CONVICTION, in *Law.* See Convict.

Conviction, in *Theology,* expreſſes the firſt degree of repentance; wherein the ſinner becomes ſenſible of his guilt, of the evil nature of ſin, and of the danger of his own ways.

Conviction, *ſummary,* in *Law,* is ſuch as is directed by ſeveral acts of parliament, for inflicting certain penalties created by thoſe acts, without the intervention of a jury: the party accuſed being acquitted or condemned by the ſuffrage of ſuch perſon only, as the ſtatute has appointed to be his judge. Of this kind are all trials of offences contrary to the laws of Excise, and other branches of the Revenue, proceedings before Justices *of the peace,* and the method uſed by ſuperior courts of juſtice for puniſhing contempt by attachment. See Contempt.

CONVIVIUM, *banquet,* in our *Ancient Cuſtoms,* and *Law-Books,* ſignifies the ſame thing among the laity as procuration among the clergy; *viz.* when the tenant was obliged, in virtue of his tenure, to provide meat and drink for his lord once, or oftener, in the year.

Convivium *militare,* a military banquet or repaſt. The repaſt of Roman ſoldiers was a particular object of military diſcipline, which the commanders themſelves paid attention to. The ſoldiers were not ſuffered to eat alone but by troops, in order to preſerve union and good fellowſhip amongſt them.

CONULI, in *Natural Hiſtory,* *Conuli* Kleinii, a claſs of the *Echinus,* in the Molluſca order of Vermes. See Echinus.

CONULUS, a genus of the *Trochus,* in the Teſtacea order of Vermes. See Trochus.

CONVOCATION, a general aſſembly of the repreſentatives of the clergy of a province, ſummoned by the king's writ to conſult of the more weighty affairs of the church, as oft as a parliament is convoked to conſult of thoſe of the ſtate.

The king's writ is directed to the archbiſhop of each province, requiring him to ſummon all biſhops, deans, archdeacons, cathedral and collegiate churches, &c.

Upon which, the archbiſhop directs his mandate to his dean provincial, firſt citing him peremptorily; then willing him, in like manner, to cite all the biſhops, deans, &c. and all the clergy of his province: but directing, withal, that one proctor ſent for each cathedral and collegiate church, and two for the body of the inferior clergy of each dioceſe, may ſuffice: which the dean accordingly does.

The place where the convocation of the province of Canterbury has been uſually held, is St. Paul's church; whence they have been prorogued to St. Peter's in Weſtminſter, in the chapel of Henry VII. or the Jeruſalem Chamber, where there is an upper and lower houſe.

The *upper* houſe, in the province of Canterbury, conſiſts of twenty-two biſhops, whereof the archbiſhop is always preſident, who prorogues and diſſolves the convocation by mandate from the king: and before the reformation abbots, priors, and other mitred prelates ſat with the biſhops. All, at the opening of a convocation, are in their ſcarlet robes and hoods.

The *lower* houſe conſiſts of twenty-two deans, fifty-four archdeacons, twenty-four proctors for the chapters, and forty-four proctors, repreſenting the parochial clergy; in all 144.

Each houſe hath a prolocutor choſen from among themſelves; and that of the lower houſe is preſented to the biſhops. Things are firſt uſually propoſed in the upper houſe; then communicated to the lower. All the members of both houſes have the ſame privilege in freedom from arreſt, as the members of parliament have, ſtat 8 Hen. VI. c. 1. and the proctors of the clergy received wages from their conſtituents.

The convocation exerciſes juriſdiction in making canons with the king's aſſent, (ſtat. 25 Hen. VIII. c. 19.) This ſtatute which reſtrains the convocation from making or executing any canons repugnant to the king's prerogative, or the laws, cuſtoms, and ſtatutes of the realm, was merely declaratory of the old common law (12 Rep. 72.); that part of it only being new, which makes the king's royal aſſent actually neceſſary to the validity of every canon. To the convocation alſo belong the examination and cenſure of heretical and ſchiſmatical books and perſons. But appeal lies from their proceedings to the king in chancery, or to his delegates. In caſe the king himſelf be a party, the appeal lies by ſtat. 24 Hen. VIII. c. 12. to all the biſhops aſſembled in the upper houſe of convocation. See COURT *of delegates*.

The archbiſhop of York, at the ſame time, holds a convocation of the clergy of his province, after the like manner at York; and, by conſtant correſpondence, debates and concludes of the ſame matters as are debated by that of Canterbury; but they are diſtinct and independent of each other; and when they uſed to tax the clergy, they granted different ſubſidies. In the province of York, the convocation conſiſts only of one houſe; and on account of the ſmall number of dioceſes in this province, each archdeaconry elects two proctors. It has been cuſtomary with the convocation, for many years back, regularly to aſſemble, and to adjourn without proceeding to any buſineſs; ſo that the convocation now exiſts more in form than for any effective purpoſe. See CHURCH *of England*.

In the year 1711, the convocation was aſſembled with the new parliament; the lower houſe choſe Atterbury for its prolocutor; and both houſes concurred in cenſuring ſome tenets that favoured Arianiſm, broached and ſupported by Mr. Whiſton, mathematical profeſſor in Cambridge. The archbiſhop doubted whether this aſſembly could proceed againſt a man for hereſy; the judges were conſulted, and the majority gave their opinion that the convocation had a juriſdiction. Five of them profeſſed the contrary ſentiment, which they maintained from the ſtatutes made at the reformation; the queen, not doubting their juriſdiction, expected them to proceed, but freſh ſcruples ariſing, they determined to examine the book, without proceeding againſt the author, and this was cenſured accordingly. An extract of the ſentence was ſent to the queen, but ſhe did not ſignify her pleaſure on this ſubject, and the affair remained in ſuſpence. Before the queen's death, in 1714, the lower houſe of convocation had declared, that a book publiſhed by Dr. Samuel Clarke, under the title of "The Scripture Doctrine of the Trinity," contained aſſertions contrary to the Catholic faith. They ſent up extracts from this performance to the biſhops; and the doctor wrote an anſwer to their objections. He was prevailed upon to write an apology, which he preſented to the upper houſe; but apprehending that it might be publiſhed ſeparately, and miſunderſtood, he afterwards delivered an explanation to the biſhop of London. This was ſatisfactory to the biſhops; but the lower houſe reſolved, that it was no recantation of his heretical aſſertions. (See the article CLARKE.) In the year 1717, the proceedings in the convocation turned chiefly upon two performances of Dr. Hoadly, biſhop of Bangor. One was entitled "A Preſervative againſt the principles and practices of the Non-jurors;" the other was a ſermon preached before the king, under the title of "The nature of the kingdom of Chriſt;" the convocation appointed a committee to examine the biſhop's two performances; and thus commenced the famous controverſy, called "Bangorian;" in conſequence of a letter written on the ſubject of the biſhop's diſcourſe by Dr. Snape, maſter of Eton college. The convocation drew up a repreſentation, in which the preſervative and the ſermon were cenſured, as tending to ſubvert all government and diſcipline in the church of Chriſt; to reduce his kingdom to a ſtate of anarchy and confuſion; to impugn and impeach the royal ſupremacy in cauſes eccleſiaſtical, and the authority of the legiſlature to enforce obedience in matters of religion by civil ſanctions. Before this repreſentation could be brought into the upper houſe, that whole aſſembly was prorogued by a ſpecial order from the king. This meaſure, however, inflamed the controverſy. A great number of pens were drawn againſt the biſhop; but his chief antagoniſts were Dr. Snape, and Dr. Sherlock, whom the king removed from the office of his chaplains. The convocation has not been permitted by government to do any buſineſs of conſequence ſince this time, but merely to confine itſelf to matters of form. See CHURCH *of England*.

The Engliſh clergy, anciently, had their repreſentatives in the lower houſe of parliament; as appears by the record, much prized by lord Coke. Among the freeholders who were preſent in parliamentary meetings, we find many of the inferior, ſecular, clergy; an order of men who were, certainly, of too great eſtimation and account in the ſtate not to have had a ſhare in the legiſlature, either perſonally or by repreſentatives. There are not, indeed, any writs of ſummons now remaining, which require proctors to be ſent for them to the parliaments of this kingdom, before the 23d year of Edward I.; but from the annals of Burton (p. 355, ſub anno 1255.) it appears, that the whole body of the clergy were ſo repreſented in the 39th of Henry III. Nor is this remarked as a novelty by any of the hiſtorians who wrote in that age; though, being all eccleſiaſtics, they would probably have thought it more worthy of obſervation than any event in which the laity alone were concerned. It may be therefore preſumed, that, not only the attendance of the inferior clergy in parliament, which is evidently proved by many paſſages in more ancient hiſtorians, but this kind of repreſentation of them had been cuſtomary long before. (See BOROUGH.) In later times, from a deſire of independence on the ſtate, to which they were incited more and more by the pope, they gradually withdrew themſelves from any attendance in parliament, either perſonally, or by repreſentatives; ſo that, after the reign of Henry VI., they are hardly ever mentioned as preſent there; although in the 21ſt year of Richard II. the commons had ſhewn in a petition to the king, "how that before thoſe times many judgments and ordinances, made in the times of the progenitors of our lord the king in parliament, had been repealed and diſannulled, becauſe the ſtate of the clergy were not preſent in parliament at the making of the ſaid judgments and ordinances." After the reformation of religion, in the reign of Edward VI., an attempt was made in convocation to have the lower houſe united to the houſe of commons, "according to ancient cuſtom, *ſicut ab antiquo fieri conſuevit*." It was alſo propoſed to queen Elizabeth, but rejected. The clergy continued to tax themſelves in a ſeparate body, till the reſtoration of Charles II.; ſoon after which they were taxed in the ſame manner and conjointly with the reſt of the commons; and have ever ſince been repreſented in parliament by the ſame perſons, which has more *embodied* them with the laity, and prevents the ſetting up of a church intereſt diſtinct from that of the people. It is remarkable, that this very important alteration in the ſtate of the kingdom was made *without any law*, by agreement with the clergy. (Littleton's Hiſt. Hen. II. vol. iii.)

In the parliament of Ireland, originally formed on the model of that of England, the clergy continued to be members of the houſe of commons, till they were excluded by an act of parliament, 28 Hen. VIII. A. D. 1536, becauſe they ſupported the authority of the pope, and obſtructed the reformation of the church. Whilſt the clergy continued to grant their own money in their convocations, their grants were not effectual till they were confirmed in parliament. In the 15th century the clergy of England had great influence in all the public councils of the kingdom, and particularly in parliament: they conſtantly reſided in the kingdom, and were preſent in theſe councils; while the nobles and great men were engaged in warlike expeditions into France or Scotland. Beſides all the archbiſhops and biſhops, twenty-five abbots and two priors were ſummoned to every parliament, and ſometimes many more; ſo that the ſpiritual lords were generally double the number of the temporal lords in the houſe of peers. (Pryrne's regiſter of writs, vol. i. & iv.) This enabled the prelates to procure ſanguinary laws againſt heretics, and to ſecure the immenſe poſſeſſions of the church, together with all her abſurd errors and wretched ſuperſtitions, from all attacks. 1 Hen. IV. c. 15. 2 Hen. V. c. 7.

CONVOLVULI, in *Botany*, the tenth natural order of dicotyledonous hypogynous plants, in the ſyſtem of Juſſieu, with the following character. *Calyx* five-cleft, moſt frequently permanent. *Corolla* regular, commonly with a five-cleft border. *Stamens* generally five, inſerted at the baſe of the corolla, and alternating with its ſegments. *Style* one, or definitely divided; when one, with a ſtigma either ſimple or divided; when more than one, with as many ſimple ſtigmas as there are diviſions. *Fruit* capſular, often three-celled, more rarely two or four-celled; cells with one or more ſeeds. *Seeds* marked with an umbilical eye at the baſe, ſomewhat oſſeous, and affixed below to the central partition; valves free, with their edges adjoining to the angles of the partition; radicle of the arched corculum inferior. (Corculum ſhut up by the periſperm?) *Stems* ſhrubby, or more frequently herbaceous; many twining; many lacteſcent. *Leaves* alternate, very rarely almoſt oppoſite, (always ſimple, Vent.). This order is nearly allied to the Borragineæ and Polemonia, in its regular five-cleft pentandrous corolla, and alternate leaves; but differs from the latter, in having the partition adjoining to the edges, not to the middle of the valves; and from the former, in the fruit not being gymnoſpermous. Juſſieu aſſigns to it the following genera: 1. With a ſingle ſtyle. Maripa, Aubl.; mouroucoa, Aubl.; retzia, Thunb.; endrachium, (humbertia, Commers.); convolvulus, Linn.; ipomæa, Linn. 2. With ſeveral ſtyles. Evolvulus, Linn.; nama, Brown and Linn.; hydrolea, Linn.; ſagonea, Aubl.; creſſa, Linn. 3. Allied to the convolvuli. Cuſcuta, Linn.; diapenſia, Linn.; loeſelia, Linn.

Ventenat has changed the name of the order to convolvulaceæ, and has included in it only convolvulus, ipomæa, evolvulus, and creſſa; entirely omitting marupa, mouroucoa, retzia, endrachium, nama, hydrolea, and ſagonea; and removing cuſcuta to his undetermined plants, and diapenſia and loeſelia to the polemonia, his polemonaceæ. La Marck's natural family of liſerons correſponds exactly with the firſt two ſections of Juſſieu.

CONVOLVULUS, (ſo called, *a convolvendo*, becauſe many of the ſpecies are twining). Linn. Gen. 215. Schreb. 287. Willd. 323. Lam. Illuſt. 296. Gært. 780. Juſſ. 133. Vent. ii. 396. Claſs and order, *pentandria monogynia*. Nat. Ord. *Campanaceæ*, Linn. *Convolvuli*, Juſſ. *Convolvulaceæ*, Vent.

Gen. Ch. *Cal.* perianth five-cleft. *Cor.* monopetalous, bell-ſhaped or funnel-ſhaped, plaited; border generally ſpreading, more or leſs five-lobed. *Stam.* filaments five, awl-ſhaped, ſhorter than the corolla, approximating at the baſe. *Piſt.* germ ſuperior, roundiſh; ſtyle filiform; ſtigma ſimple or bifid. *Peric.* capſule ſurrounded by the calyx, roundiſh; one, two, three, or four-celled; one, two, three, four, or many-valved. *Seeds* one or two in each cell.

Eſſ. Ch. Five-cleft. Corolla bell or funnel-ſhaped. Stigmas one or two. Pericarp a capſule, or dry berry. Seeds one or two in each cell.

Obſ. Authors often call the calyx five-leaved, when it is very deeply five-cleft.

* *Stems twining.*

Sp. 1. C. *arvenſis.* Linn. 1. Mart. 1. Deſrouſſeaux, Encyc. 2. Lam. Ill. 2001. Willd. 1. Bauh. Pin. 294. Flor. Dan. tab. 459. Curt. Flor. Lond. 2. 13. Eng. Bot. 312. (C. minor; Bauh. Hiſt. 2. 157. C. purpureus; Lob. Obſ. 340. fig. 2. C. minor arvenſis, flore roſeo; Tourn. Inſt. 83. Smilax levis minor; Ger. Emen. 861. Helxine foliis ſagittatis, ciſſampelos; Mat. 1011. Camer. Epit. 753.) "Leaves arrow-ſhaped; lobes acute; flowers generally ſolitary; bractes minute, awl-ſhaped, remote from the flower." *Root* perennial, creeping, ſtriking deeply into the ground, not eaſily extirpated. *Stems* numerous, angular. *Leaves* alternate, petioled, ſmoothiſh. *Flowers* fleſh-coloured, ſometimes white, ſweet-ſcented, opening only in clear weather; peduncles axillary, generally one-flowered, thickened above. A troubleſome weed in cultivated ground, twining cloſely about the culms of wheat, and other kinds of corn, and thence in many parts of England called bind-weed. Its juice is ſlightly purgative. The bloſſoms give a deep yellow or orange tincture to water, which is heightened by alum and alkalis. A native of Great Britain, and moſt parts of Europe. 2. C. *auriculatus*. Deſr. 3. Lam. 2002. (C. arvenſis β; Linn. C. minimus, anguſto auriculato folio; Bocc. Muſ. tab. 33. Pluk. Alm. 116. tab. 24. fig. 3. C. arvenſis minimus; Rai. Syn. 276.) "Leaves linear, haſtate-acuminate; lobes entire." Diſtinguiſhed from the preceding by its narrow elongated leaves, longer petals, and bractes placed nearer the flower. A native of Great Britain, and other parts of Europe: found by Commerſon in the Iſle of France, where it is ſuppoſed to have been brought with wheat from Perſia. 3. C. *ſepium*. Linn. 2. Mart. 2. Deſr. 1. Lam. 1. Willd. 2. Flor. Dan. tab. 458. Curt. Flor. Lond. 1. tab. 13. Eng. Bot. 313. (C. major, albus; Bauh. Pin. 294. Tourn. Inſt. 82. Smilax lœvis major; Ger. Emen. 861.) "Leaves arrow-ſhaped; lobes truncate; peduncles ſquare, one-flowered; bractes larger than the calyx, and cloſe to it." β americanus; with a fleſh-coloured flower. Bot. Mag. 732. *Root* perennial, about the thickneſs of a gooſe-quill, white, creeping, not eaſily eradicated. *Stems* numerous, from ſix to ten inches high, or more, angular, ſmooth, not much branched. *Leaves* alternate, petioled, dependent. *Flowers* large, generally white, ſometimes fleſh-coloured; nectary a yellow gland, ſurrounding the baſe of the germ. A native of Great

Britain, and moſt parts of Europe, climbing up hedges in moiſt ground. Its inſpiſſated juice, taken in doſes of twenty or thirty grains, is a powerful purgative. 4. C. *Wheeleri.* Mart. 84. Willd. 3. Vahl. Symb. 2. 366. (C. ſagittariæ foliis, Wheeleri; Pluk. Phyt. tab. 85. fig. 3. Ipomæa ſagittata; Poir. It. 2. 160. tab. 3.) "Leaves arrow-ſhaped, roundiſh behind, entire; peduncles cylindrical, one-flowered." Wholly ſmooth. *Leaves* acute; petiole the length of the leaf. *Peduncles* ſhorter than the petiole, thicker, bractate towards the middle, thicker under the flower. Allied to C. ſepium. A native of Spain and Barbary. 5. C. *ſcammonia.* Linn. 3. Mart. 3. Deſr. 81. Lam. 2079. Woodv. Med. Bot. 13. tab. 5. (C. ſyriacus, ſive ſcammonia; Moriſ. Hiſt. 2. 12. tab. 3. fig. 5. Bauh. Pin. 294.) "Leaves triangular-arrow-ſhaped; peduncles cylindrical, nearly double the length of the leaves, about three-flowered." *Root* perennial, long, thick, fleſhy, full of a milky juice. *Stems* cylindrical, ſlender, ſomewhat villous. *Leaves* alternate ſmooth, acute; poſterior lobes diverging, with a tooth on the inner ſide of each. *Flowers* large, purpliſh white or pale yellow; peduncles ſolitary; ſegments of the calyx emarginate; bractes ſmall, awl-ſhaped, ſpreading, remote from the flower. *Capſule* three or four-celled. A native of Syria and Aſia Minor. For its medical uſes, ſee SCAMMONY. 6. C. *involucratus.* Willd. 5. "Leaves cordate-haſtate, pubeſcent; peduncles about three-flowered; calyxes bracteate." *Stem* cylindrical, pubeſcent-villous. *Leaves* oblong, obtuſe, mucronate, quite entire, pubeſcent on both ſides; truncate at the baſe, undivided, rather obtuſe; petioles villous. *Peduncles* about the length of the leaves, pubeſcent. *Bractes* two at the diviſion of the peduncle, pubeſcent, oblong, acute; two others at the baſe of each flower, villous-pubeſcent, elliptical, rather acute, longer than the calyx, and involving it. A native of Guinea. 7. C. *ſagittifolius.* Smith Prod. Fl. Gr. p. 133. Flor. Græc. tab. 193. "Leaves cordate-haſtate, covered with long diſtinct hairs, angular at the baſe; peduncles generally one-flowered; capſules hirſute." A native of the iſlands in the Archipelago, in vineyards and cultivated ground. 8. C. *ſibiricus.* Linn. Mantis. 203. Mart. 4. Deſr. 80. Lam. 2078. Willd. 6. (C. rupeſtris; Pallas It. 3. n. 80. tab. K.) "Leaves cordate-acuminate, even-ſurfaced; peduncles two-flowered; ſtipules retuſe, decurrent." *Root* annual. *Stems* from four to ſix feet long, ſlender, ſlightly winged from the decurrence of the ſtipules, but not two-edged. *Leaves* ending in a point, which extends to half their whole length, ſoft, thin, ſmooth, veined, entire, paler underneath; ſtipules vertical, ſmall, obtuſe. *Flowers* ſmall, ſcarcely twice the length of the calyx, whitiſh or fleſh-coloured, fugacious; bractes often wanting; when preſent, briſtle-ſhaped, ſometimes at the diviſion of the peduncle, ſometimes on the pedicels; calyx ſmooth, deeply divided; ſtigma capitate, two-lobed. A native of Siberia, floweringin July and Aug. Introduced into England in 1779. 9. C. *rupeſtris.* Willd. 7. "Leaves obtuſely heart-ſhaped, oblong, lanceolate, acute; peduncles one-flowered." *Stem* ſmooth, but little twining, ſomewhat ſhrubby. *Leaves* two inches long, ſmooth, ſlightly hairy underneath, and at the edges, when viewed through a lens. *Flowers* violet; peduncles almoſt the length of the leaves; bractes two, awl-ſhaped, about the middle of the peduncle; calyx-leaflets, egg-ſhaped, acute, a little hairy; corolla flat, five-plaited; plaits a little hairy on the outſide. Suppoſed to be a native of Siberia. 10. C. *farinoſus.* Linn. Mant. 203. Mart. 5. Deſr. 79. Lam. 2077. Wild. 8. Jacq. Hort. Vind. 1. 13. tab. 35. Saliſb. Par. Lond. 45. "Leaves heart-ſhaped, acuminate, repand; peduncles three-flowered; ſtem mealy." Linn. "Stem with a ſilky pubeſcence, which appears at a little diſtance like duſt; leaves cordate, arrow-ſhaped, with the baſe of the ſinus prominent, repand-toothed, ſmooth above: panicles from three to ſeven-flowered; border of the corolla ſharply five-cleft; ſtigmas ſmooth." Saliſb. *Root* annual. *Stem* ſix feet high, about the thickneſs of a gooſe-quill. *Leaves* remote, but from the number of branches appearing crowded. *Flowers* pale roſe-coloured; peduncles longer than the leaves, ſlender, cylindrical; pedicels turned upward after flowering; bractes ſmall, tinged with dull purple towards the top; ſegments of the calyx purpliſh, mucronate; tube of the corolla pale green, funnel-ſhaped, pentangular, ſhining; filaments whitiſh, attached to the tube nearly its whole length, ſlightly pubeſcent; anthers pale blue. *Nectary* deep yellow. *Capſule* two-celled, two ſeeds in each cell. Saliſb. Four-celled, one ſeed in each cell. Jacq. A native of fields and hedges in Myſia, Livadia, and Peloponneſus; Sibth. Madeira; Maſſon. 11. C. *lanuginoſus.* Mart. 85. Willd. 9. Vahl. Symb. 3. 23. "Leaves heart-ſhaped, oblong, ſomewhat haſtate, tomentous-ſilky, auricled, toothed; peduncles three-flowered; ſtem hairy." *Stem* herbaceous, beſet with numerous ferruginous hairs. *Leaves* on ſhort peduncles, acute; auricles with two teeth. *Flowers* reſembling thoſe of ſcammony, yellowiſh, having a purpliſh lanceolate line, with a pile of yellow hairs on each ſegment of the border; bractes two at the diviſion of the peduncle, lanceolate; two others on each lateral pedicel near the flower; middle pedicel ſhorter, without bractes; peduncles axillary, ſolitary, hairy; three outer leaflets of the calyx egg-ſhaped, acuminate, rough with hairs; ſtyle bifid. Suppoſed to be a native of the Levant. 12. C. *incanus.* Mart. 86. Willd. 10. Vahl. Symb. 3. 23. "Tomentous-ſilky; leaves lanceolate-arrow-ſhaped, obtuſe, often with two teeth at the baſe; peduncles two-flowered." *Stem* herbaceous, cylindrical. *Leaves* an inch and half long, rounded at the end, mucronate, gradually wider towards the baſe; auricles rounded behind; petioles one fourth of the length of the leaf. *Peduncles* the length of the leaves; pedicels one ſhorter and thicker, with two bractes at the baſe; one longer, with two briſtle-ſhaped bractes in the middle; ſegments of the calyx egg-ſhaped, acute; outer ones more villous; corolla villous on the outſide; ſtyle bifid. *Capſule* ſmooth, globular. A native of America. 13. C. *ſalicifolius.* Deſr. 17. Lam. 2016. "Leaves lanceolate, ſerrated, on ſhort petioles; calyx angular." *Stems* cylindrical, ſlender. *Leaves* three or four inches long, narrowed to a point at both extremities. *Peduncles* ſhorter than the leaves, axillary, ſolitary, one-flowered; bractes two, very ſmall, awl-ſhaped, at a diſtance from the flower; calyxes five-leaved. A native of St. Domingo; ſpecimen in the herbarium of La Marck. 14. C. *emarginatus.* Mart. 87. Willd. 11. Vahl. Symb. 3. 23. (C. uniflorus; Deſr. 18. Lam. 2017. Burm. Ind. 47. tab. 21. fig. 2.) "Leaves lanceolate; lower ones emarginate, mucronate; peduncles one-flowered; outer calyx-leaves ſemiovate, large." *Stem* rooting at the bottom, muricated upwards, with ſmall ſpines, and having minute hairs ſcattered over it at the top. *Leaves* thickiſh, veinleſs, ſmooth; lower ones acute at the baſe; upper ones rounded at the baſe, mucronate. *Peduncles* ſolitary, with two minute bractes above the middle; calyx-leaves ſmooth, the length of the corolla; three outer ones acute, mucronate; two inner ones linear-lanceolate, attenuated; corolla with five lines on the outſide, which are cloſely beſet with fulvous ſhining hairs; ſtigma capitate. Capſule ſmooth, ſhorter than the calyx. A native of the Eaſt Indies. 15. C. *nitidus.* Deſr. 19. Lam. 2018. "Leaves oval, ſhining, ſilky-white underneath; peduncles one-flowered, ſhorter than the petiole." *Root* perennial. The young branches, petioles, leaves, peduncles, and calyxes, cloathed with a ſilky ſhining down. *Stem* cylindrical, woody, almoſt ſmooth. *Leaves* broad-oval, alternate, acute, entire, nerved, about twice the length of the petioles. *Peduncles* axillary, ſolitary, with two awl ſhaped bractes about the middle; calyxes ſhort; two inner leaves ſmaller; corollas at leaſt two inches long, funnel-ſhaped. A native of the Philippine iſlands. Specimen in the herbarium of Juſſieu. 16. C. *chenopodioides*. Deſr. 21. Lam. 2020. "Villous; leaves egg-ſhaped, ſerrate-ſinuated; flowers ſolitary, nearly ſeſſile." *Stems* ſlender, weak, cylindrical. *Leaves* an inch long; petioles about half their length, channelled. *Peduncles* axillary, ſolitary; bractes two, ſmall, filiform, rather long; leaves of the calyx egg-ſhaped, acute, corollas narrow, tabular. In the herbarium of La Marck. 17. C. *medium*. Linn. Sp. Pl. 4. Mart. 6. Deſr. 10. Lam. 2009. Willd. 12. "Leaves linear, haſtate-acuminate; auricles toothed; peduncles one-flowered; calyxes arrow-ſhaped." Plant ſmooth in all its parts. *Root* annual. *Stems* very ſlender. *Peduncles* axillary, ſolitary, often bent in the middle at the origin of the two bractes; upper half angular, thicker; three outer leaves of the calyx large, nearly as long as the peduncles, acute, arrow-ſhaped at the baſe, like thoſe of campanula medium; auricles terminated by two or three ſmall teeth; two inner ones entire, acute, a little ſhorter; corolla not longer than the calyx. A native of Madagaſcar and the Eaſt Indies. 18. C. *filicaulis*. Mart. 88. Willd. 13. Vahl. Sym. 3. 24. "Leaves linear-lanceolate, obtuſe, mucronate, dilated and toothed at the baſe; calyx leaves oblong." *Root* annual. *Stem* herbaceous, filiform, branched. *Leaves* on very ſhort petioles, diſtant, two inches long or more, tender, veined, quite ſmooth. *Peduncles* axillary, filiform, thicker at the top; bractes two, oppoſite, awl-ſhaped, above the middle of the peduncle; calyx-leaves mucronate, ſmooth; ſtigma ſimple, bluntiſh. A native of Guinea. 19. C. *tridentatus*. Linn. Sp. Pl. Ed. 1. Mart. 76. Deſr. 12. Lam. 2011. Willd. 14. Pluk. Alm. 117. tab. 276. fig. 6. & Mant. 117. tab. 167. fig. 5. (Evolvulus tridentatus; Linn. Sp. Pl. Ed. 2. Fendera-claudi; Rheed. Mal. 11. 133. tab. 65.) "Leaves ſpatulate-linear, three-toothed at the tip, dilated and toothed at the baſe; calyx-leaves elliptical, cuſpidate." *Root* annual. *Stems* filiform, ſmooth, ſlightly ſtriated, almoſt ſimple. *Leaves* alternate, about half an inch long, ſmooth; petioles about a line long. *Flowers* purpliſh at the baſe, with a yellowiſh white border; peduncles axillary, ſolitary, one-flowered, longer than the leaves, with two ſmall bractes near their ſummit. A native of the Eaſt Indies. Introduced into England in 1778, by ſir Joſeph Banks. 20. C. *anguſtifolius*. Mart. 89. Deſr. 32. Lam. 2030. Willd. 15. (Ipomæa anguſtifolius; Jacq. ic. 2. tab. 317.) "Leaves linear, haſtate, obtuſe, mucronate, ſmooth; auricles generally entire; peduncle one-flowered." *Root* ſpindle-ſhaped, riſing about an inch above the ſurface of the ground, with the appearance of a ſlender, ſimple, erect, leafleſs ſtem. *Stems* ſeveral, ſcarcely a foot high, a little twining, almoſt ſimple, filiform, weak. *Leaves* an inch long, about a line broad, numerous, on very ſhort petioles. *Flowers* yellow, longer than the calyx; peduncles axillary, ſolitary, ſhorter than the leaves, with two awl-ſhaped bractes, about the middle, upper half thicker; calyx-leaves connivent, lanceolate, mucronate; corolla funnel-ſhaped; border very open; diviſions egg-ſhaped, obtuſe; ſtigma globular, didymous. *Capſule* two-celled. A native of Guinea and the Eaſt Indies. 21. C. *ariſtolochifolius*. Mill. Houlton MSS. "Leaves haſtate-lanceolate; auricles rounded; peduncles many-flowered." *Root* annual. *Stem* ten feet high, ſlender. *Flowers* yellow, in ſmall cluſters, on long peduncles. *Capſules* trigonous, three-celled. *Seeds* two in each cell. Seeds ſent to Mr. Miller from Carthagena in New Spain. 22. C. *Adanſonii*. Deſr. 82. Lam. 2080. "Leaves haſtate, linear,; ſtipules in pairs, ſomewhat filiform; calyx muricated." *Stems* herbaceous, weak, a little villous. *Leaves* alternate, diſtant, petioled, entire, ſmooth, from three to four inches long; ſtipules about an inch long. *Flowers* near two inches long, axillary; peduncles nearly the length of the petioles, ſmooth, with two ſmall bractes about the middle; calyx-leaves egg-ſhaped, rough, with ſharp tubercles. A native of Senegal. 23. C. *japonicus*. Mart. 7. Deſr. 6. Lam. 2005. Willd. 16. Thunb. jap. 85. (Kos and Kudſi vulgo Firaga wo; Kempf. Amæn. 5. 856.) "Leaves haſtate, lanceolate, acute; lateral lobes one-toothed; peduncles one-flowered; ſtem ſimple." *Stems* filiform, ſmooth. *Leaves* alternate, almoſt unilateral, petioled, ſmooth; middle lobe an inch long, lanceolate, entire, acute; ſide ones a little reflexed, ſhorter. *Flowers* axillary, ſolitary; peduncles as long as the leaves, filiform, ſmooth; calyx-leaves egg-ſhaped, acute, entire, ſmooth. A native of Japan. 24. C. *ebracteatus*. Deſr. 7. Lam. 2006. "Leaves cordate-arrow-ſhaped, obtuſe behind; peduncles ſhorter than the petiole, without bractes." Whole plant, except the corolla, cloathed with ſhort white hairs. *Stems* ſcarcely a foot and a half long, ſlender. *Leaves* alternate, acute. *Flowers* white, ſmall; peduncles one or two-flowered; ſegments of the calyx five; two outer ones broader; ſtigmas two, globular, purpliſh. Native country unknown. Cultivated in the botanic garden at Paris. 25. C. *leucanthus*. Deſr. 8. Lam. 2007. (Ipomæa leucantha; Jacq. Coll. 2. 280. ic. 2.) "Leaves heart-ſhaped, acuminate: peduncles ſhorter than the petiole." *Root* annual. *Stems* about four feet high, ſlender, cylindrical, branched, reddiſh, and ſomewhat rough towards the bottom. *Leaves* alternate, entire, or ſlightly ſcolloped, ſmooth. *Flowers* white; peduncles axillary, ſolitary, an inch long, erect, cylindrical, ſmooth, one-flowered: calyx leaves mucronate, a little open at the ſummit, ciliated at the baſe; corolla funnel-ſhaped: anthers purpliſh; ſtigma two-lobed. A native of America in the torrid zone. 26. C. *fruticuloſus*. Deſr. 9. Lam. 2008. "Shrubby; leaves ſomewhat heart-ſhaped at the baſe, linear, lanceolate, petioles ſhort; flowering branches, thick ſet with leaves." *Root* perennial. *Stems* three or four feet high, cylindrical, ſlender. *Leaves* not more than two lines broad, ſloped at the baſe, on very ſhort petioles. *Flowers* with five purple rays; peduncles larger than the petioles, ſcarcely the length of the flowers; bractes two, ſmall, awl-ſhaped, unequal, ſituated nearer to the ſtem than to the calyx; calyx ſmooth; corolla ſhallowly five-lobed. A native of the Canary iſlands, flowering in April and May. 27. C. *dentatus*. Mart. 90. Willd. 17. Vahl. Symb. 3. 25. "Leaves haſtate, ſmooth; auricles toothed; peduncles many-flowered, muricated." *Stem* cylindrical, ſmooth. *Leaves* ſcarcely an inch long, ſomewhat heart-ſhaped at the baſe; middle lobe lanceolate, quite entire; ſide ones roundiſh, unequally four or five-toothed; petioles filiform, often ſomewhat muricated towards the baſe. *General peduncles* ſpreading, thicker, and a little longer than the petioles; partial peduncles in threes; that in the middle one-flowered; ſide ones with two or three pedicelled flowers; both muricated; rigid; calyx-leaves oblong, obtuſe, mucronate, equal. A native of the Eaſt Indies, found by Schumacher. 28. C. *haſtatus*. Mart. 79. Willd. 18. Vahl. Symb. 1. 15. Forſk. deſcr. 203. "Leaves lanceolate, haſtate; peduncles axillary, in pairs, two-flowered." *Stem* hairy. *Leaves* remote, quite entire, ſmooth on the upper ſurface, villous on the lower; auricles rounded, ſometimes with one tooth behind: petiole half the length of the leaf. *Peduncles* ſhorter than the petiole, villous; calyx-leaves hairy, acuminate, patulous at the tip. A native of Egypt and Arabia. 29. C. *Sonneratii*. (C. haſtatus; Deſr. 11. Lam. 2010. Tala-neli; Rheed. Mal. 11. 113. tab. 55.) "Leaves linear, haſtate-acuminate; auricles toothed; calyx-leaves ſimple." Whole plant ſmooth. *Stems* very ſlender, ſlightly angular. *Leaves* about two lines broad, alternate, nearly ſeſſile. *Peduncles* longer than the flower, ſlender, one or two-flowered, often bent at the inſertion of the bractes, thicker upwards; bractes two, ſmall, awl-ſhaped, ſituated a little above the middle of the peduncle. *Flowers* yellowiſh-white, twice the length of the calyx; calyx-leaves egg-ſhaped, acute. A native of the Eaſt Indies, communicated to La Marck by Sonnerat. 30. C. *aſarifolius*. Deſr. 89. Lam. 2087. "Leaves kidney-ſhaped, broad, veined; peduncles one or two-flowered." *Stems* cylindrical, ſmooth, not much branched. *Leaves* alternate, large, entire, ſmooth, firm; petioles about two inches long, channelled. *Peduncles* longer than the petioles; bractes from two to four, ſmall, awl-ſhaped, ſituated almoſt cloſe to the flowers; calyx-leaves ſhort, egg-ſhaped, obtuſe, two outer ones ſmaller; corollas at leaſt two inches long, tubular; tube about half an inch diameter; border but little open, with five pointed diviſions; ſtigma capitate, didymous. A native of Senegal. 31. C. *tiliæfolius*. "Shrubby; leaves heart-ſhaped, rounded; younger ones ſomewhat tomentous; flower and fruit very large." *Stems* cylindrical, almoſt ſmooth. *Leaves* alternate, a little orbicular, entire; petioles about half the length of the leaves, channelled. *Flowers* large; peduncles not more than eight or ten lines long, axillary, ſolitary, one-flowered; calyx-leaves ſhort, obtuſe, almoſt round; corolla at leaſt three inches long, almoſt cylindrical; tube narrow as far as the length of the calyx, afterwards eight or ten lines in diameter; ſtigma capitate, two lobed. *Capſule* about the ſize of a walnut, apparently two-celled. A native of the Iſle of France, and the Cape of Good Hope. Found by Commerſon. 32. C. *panduratus*. Linn. Sp. Pl. 5. Mart. 8. Deſr. 91. Lam. 2089. Willd. 19. (C. megalorrhizos; Dill. Elth. 101. tab. 85. fig. 99.) "Leaves, ſome heart-ſhaped, entire, others panduriform or three-lobed; peduncles longer than the petiole, about two-flowered." *Root* perennial, thick, ſpindle-ſhaped. *Stems* long, ſlender. *Leaves* diſtant, petioled. *Flowers* large, white, with the bottom of fine purple; peduncles axillary, ſolitary, from one to three-flowered; calyx-leaves ſhort, two outer ones ſhorter and narrower. *Capſule* two-celled. *Seeds* hirſute, one in each cell. A native of Carolina and Virginia, flowering from June to September. 33. C. *betonicifolius*. Mart. 72. "Leaves cordate-arrow-ſhaped, acute; peduncles one-flowered." *Stem* five or ſix feet high, ſlender. *Flowers* white, with purple bottoms; peduncles long, ſlender. A native of Africa, cultivated by Miller in 1730. 34. C. *bracteatus*. Mart. 91. Vahl. Sym. 3. 25. "Leaves heart-ſhaped, almoſt entire, and three-lobed, haſtate, attenuated; peduncles one-flowered; outer calyx-leaves bracte-ſhaped." *Stem* thinly beſet with ſhort hairs. *Leaves* two inches long; petioles ſhorter than the leaf, pubeſcent. *Peduncles* the length of the leaf, ſolitary; bractes two, lanceolate, acute, ſituated a little below the calyx; calyx pubeſcent; inner calyx-leaves oblong, bluntiſh, nerved; outer ones much broader, encloſing the others as between two bractes; corolla villous on the outſide, tender, ſilky; border five-cleft; ſtigma capitate, two lobed, found in the Eaſt Indies by Koenig. 35. C. *bicolor*. Mart. 92. Willd. 21. Vahl. Symb. 3. 25. "Leaves heart-ſhaped, villous, ſomewhat angular-lobed at the baſe; peduncles one-flowered; outer leaves of the calyx reſembling bractes." *Stem* villous. *Leaves* acute, mucronate, not attenuated, nearly equal in length and breadth, one, two, or three-lobed at the bottom, villous on both ſides; very ſoftly villous, hoary, and obſcurely veined underneath; the younger ones ſilky. *Flowers* white, with a violet purple baſe; bractes, calyx, and corolla, as in the preceding ſpecies. Found in the Eaſt Indies by Schumacher. 36. C. *Geffroyenſis*. (C. bicolor; Deſr. 96. Lam. 2094.) Hairy; leaves ſomewhat heart-ſhaped, three-lobed, hoary underneath; peduncles many-flowered." On a ſuperficial view having the appearance of a bramble. *Stems* ſlender, cylindrical; beſet, as well as the petioles, peduncles, and calyxes, with blackiſh points, and hiſpid with rather long ſtiffiſh hairs. *Leaves* alternate, longer than their petioles, cloathed with fine recumbent hairs, green on the upper ſurface, hoary underneath; lobes oval, acute, entire. *Flowers* ſmall; peduncles axillary, ſolitary, thicker and longer than the petioles, dichotomous; bractes two, linear, awl-ſhaped, ſituated at each diviſion of the peduncles; calyx-leaves narrow, acute, rather long. Brought from Senegal by M. Geoffroy. 37. C. *trilobus*. Willd. 22. Thunb. prod. 35. "Leaves heart-ſhaped, villous, three-lobed; lobes egg-ſhaped, acute; peduncles one flowered." A native of the Cape of Good Hope. 38. C. *ſubquinquelobus*. (C. trilobus; Deſr. 94. Lam. 2092. Ipomæa triloba; Linn.) "Lower leaves heart-ſhaped, three-lobed; upper ones ſomewhat five-lobed; peduncles three-flowered." *Root* annual. *Stems* two or three feet long, ſlender, ſlightly angular, ſmooth. *Leaves* alternate, generally ſhorter than their petioles; middle lobes of the lower leaves egg-ſhaped, obtuſe, mucronate, ſmooth; lateral lobes of the upper leaves with a deep ſinus, which makes them appear five-lobed. *Flowers* purple or violet; peduncles angular, nearly the length of the petioles; pedicels very ſhort, bractes ſmall, egg ſhaped; calyx-leaves half the length of the corolla, ſmooth, egg-ſhaped, acute, connivent; corollas ſmall, cylindrical; border with five ſharp teeth. A native of South America, cultivated in the botanic garden at Paris. 39. C. *platanifolius*. Mart. 93. Willd. 23. Vahl. Symb. 3. 26. Pluk. phyt. tab. 167. fig. 3. Feuil. peruv. 3. 16. tab. 11. "Leaves heart-ſhaped, three-lobed; lateral lobes toothed-angular; peduncles, ſomewhat three-flowered; calyxes almoſt as long as the peduncles, ſmooth." Whole plant quite ſmooth, except the petioles. *Stem* cylindrical. *Leaves* two inches long or more, glaucous, green underneath, with purpliſh veins; lobes lanceolate; middle one longer, broader, quite entire, acuminate; lateral ones narrower, attenuated, with a ſmaller broader lobe at the bottom on each ſide, rounded behind, and furniſhed with an angular tooth; petioles ſhorter than the leaf, beſet with a few ſcattered hairs. *Peduncles* ſolitary, ſhorter than the leaf, thickened at the top; lower ones three-flowered; middle ones two-flowered, uppermoſt one-flowered; calyx-leaves oblong, ſomewhat membranous, ending in a briſtle; ſtigma capitate. It differs altogether from C. batatas in the ſmoothneſs of the ſtem, and the form of the leaves. A native of America. 40. C. *acuminatus*. Mart. 94. Willd. 24. Vahl. Symb. 3. 26. "Leaves heart-ſhaped and three-lobed, attenuated; peduncles elongated, many-flowered; calyxes ſmooth." *Stem* with a few minute ſcattered hairs, preſſed cloſe, and viſible only with a magnifier. *Leaves* four inches long, three or more broad at the baſe, three-lobed or entire, quite ſmooth, nerved, acute; lateral lobes lanceolate; middle one egg-ſhaped, attenuated; petioles longer than the leaf. *Flower* large, bell-ſhaped, purple with a pale baſe and five paler rays running to the margin; peduncles axillary, the length of the petioles alternate; pedicels about five, an inch and half long; bractes at the baſe of each pedicel two, lanceolate, attenuated, finely nerved, ſmooth; calyx-leaves lanceolate, attenuated, tender, finely nerved, quite ſmooth; two inner ones a little ſhorter, ſtigma capitate. A native of the iſland of Santa Cruz in the Weſt Indies. 41. C. *carolinus*. Linn. Sp. Pl. 6. Mart. 9. Deſr. 90. Lam. 2088. Willd. 25. Dill. elth. 100. tab. 84. fig. 98. "Leaves heart-ſhaped, entire, and three-lobed, villous; calyxes even-ſurfaced; capſules hirſute; peduncles one or two-flowered." *Root* perennial. *Stems* ſlender, reddiſh towards the root, hairy at the joints. *Leaves* alternate, ſcarcely two inches long, ſome entire, others like thoſe of ivy; petioles about the length of the leaves, ſlender, channelled. *Flowers* pale purple, reſembling thoſe of C. arvenſis; peduncles the length of the petioles, thicker, axillary, ſolitary, angular, with a few narrow bractes; calyx-leaves egg-ſhaped, acute, ſcarcely half the length of the corolla, a little ciliated at the edges with whitiſh hairs. *Capſules* round, hairy towards the ſummit, two-celled, four-valved. *Seeds* two in each cell. A native of Carolina. 42. C. *hederaceus*. Linn. Sp. Pl. 7. Mart. 10. Deſr. 92. Lam. 2090. Dill. elth. 99. tab. 83. fig. 96. Gært. tab. 134. fig. 2. "Leaves heart-ſhaped, entire and three-lobed; corollas undivided; fruit erect." Linn. "Peduncles about three-flowered; calyxes tubercled." Lam. *Root* annual. *Stems* ſarmentous, cylindrical, dull red, two or three feet high. *Leaves* alternate, petioled, cloathed with fine ſhort hairs. *Flowers* fine blue, with a pale baſe; peduncles nearly the length of the petioles, axillary, ſolitary, hairy; bractes ſmall; pedicels very ſhort; calyx-leaves rough with numerous long hairs, and ſmall black tubercles; two of them narrower. *Capſules* ſpherical, ſmooth, thin, three-celled, three-valved. *Seeds* two in each cell, black, ſmooth. A native of Aſia, Africa, and America. 43. C. *Dillenii*. Deſr. 22. Lam. 2021. Dill. elth. 97. tab. 81. fig. 93. "Leaves heart-ſhaped, entire, and three-lobed; flowers ſolitary, almoſt ſeſſile." Diſtinct from the preceding, with which it has been confounded. *Root* annual. *Stems* long, ſlender, hairy. *Leaves* alternate, ſlightly villous, paler underneath; lobes angular; petioles ſhorter than the leaves, hairy. *Flowers* fine blue, with a whitiſh baſe; peduncles axillary, ſolitary; calyxes oblong, five-cleft, hairy; corollas large, very open, almoſt entire, ſuppoſed to be a native of Africa. 44. C. *nil*. Linn. Sp. Pl. 8. Mart. 11. Willd. 27. Bot. Mag. 188. C. cæruleus; Ger. em. 864. fig. 1. C. hederaceo anguloſo folio; Bauh. p. 295; Dill. elth. 96. tab. 8. fig. 91, 92. Ipomæa hederacea; Lam.? J. trilobata; Thun. Flor. jap. 86. Linn. Tranſ. 2. 330.) "Leaves heart-ſhaped, three-lobed; corollas ſemiquinquefid; peduncles ſhorter than the petiole." *Root* annual. *Stem* eight or ten feet high. *Leaves* woolly, acuminate, on long petioles. *Flowers* deep blue, with purple rays; peduncles two-flowered. *Fruit* erect. Nil is an abbreviation of Anil, one of the names of indigo. A native of America. 45. C. *purpureus*. Linn. Sp. Pl. 9. Mart. 12. Willd. 28. Bot. Mag. 113. (C. purpureus folio ſubrotundo; Bauh. p. 295. Ipomæa purpurea; Lam.) "Leaves heart-ſhaped, undivided; fruit nodding; pedicels thickened." *β*. cæruleus minor, folio ſubrotundo. Dill. elth. 98. tab. 83. fig. 95. ſmaller, blue-flowered, with a roundiſh leaf. *γ*. C. folio cordato glabro. Dill. elth. 98. tab. 84. fig. 97. with a heart-ſhaped ſmooth leaf. *δ*. elatior; Bot. Mag. 1005. Stems very high; leaves orbicular-heart-ſhaped; flowers white, with five ſpots, elegantly ſhaded with blue and carmine. All the varieties are natives of America. The firſt is a hardy annual, common in the Engliſh gardens, under the name of Convolvulus major. 46. C. *obſcurus*. Linn. Sp. Pl. 10. Mart. 14. Deſr. 15. Lam. 2014. Willd. 29. Dill. elth. 98. tab. 83. fig. 95. "Leaves heart-ſhaped, undivided; ſtem ſomewhat pubeſcent; peduncles thickened, one-flowered; calyxes ſmooth." *Root* annual. *Stems* cylindrical, villous towards the top, three or four feet high. *Leaves* alternate, acute, green, and ſmooth above, paler and a little villous underneath; petioles one or two inches long. *Flowers* white, with a purple baſe and yellowiſh rays; peduncles longer than the petioles, ſlender, ſlightly pubeſcent towards the bottom, with two ſmall bractes. A native of Java, and other parts of the Eaſt Indies. 47. C. *flavus*. Willd. 30. (Evolvulus hederaceus; Burm. Ind. 77. tab. 30. fig. 2.) "Leaves heart-ſhaped, repand, ſomewhat lobed, with ſmall mucronate teeth; peduncles bifid, many-flowered." *Stem* rather ſmooth. *Leaves* acuminate, ſomewhat ſcabrous. *Peduncles* much longer than the leaves; upper ones three-flowered; lower ones bifid; branches three-flowered, with a ſingle flower at the diviſion. A native of the Eaſt Indies. 48. C. *angularis*. Linn. Mant. 203. Mart. 13. Deſr. 98. Lam. 2098. Willd. 31. Burm. Ind. 46. tab. 19. fig. 2. "Leaves heart-ſhaped, pentangular, quite entire, villous; peduncles many-flowered." *Stems* pubeſcent. *Leaves* on ſhort petioles, quite entire, rough with reddiſh ſhining hairs. *Flowers* orange; peduncles the length of the leaves, axillary, ſolitary, moſt commonly three-flowered; calyx hairy; ſegments acute; corollas bell-ſhaped, three times longer than the calyx. A native of the Eaſt Indies. 49. C. *Batatas*. Linn. Sp. Pl. 11. Mart. 15. Willd. 32. (Batatas; Bauh. Pin. 91. Rumph. Amb. 5. 367. tab. 130. C. radice tuberoſa eſculenta; Cateſb. Car. tab. 60. Ipomæa Batatas; Lam.) Spaniſh or ſweet potatoes. "Leaves heart-ſhaped, haſtate, five-nerved; ſtem hiſpid, creeping, bearing tubers." *Root* perennial. *Stem* cylindrical, perennial, hiſpid, proſtrate, creeping; ſending out ſcattered, oblong, acuminate tubers, purple or pale on the outſide. *Leaves* angular, on long petioles. *Flowers* purple, large, about three together, on upright peduncles. A native of the Weſt Indies, whence it is ſaid to have been introduced by the Spaniards into the Philippine iſlands. It is now extenſively cultivated in the tropical climates of both hemiſpheres, for the ſake of its tubers. They are ſweet, ſapid, and eſteemed nouriſhing, and are the common potatoe of our old Engliſh botaniſts. There are ſeveral varieties, and probably more than one diſtinct ſpecies. 50. C. *maximus*. Linn. jun. Sup. 137. Mart. 25. Willd. 33. Vahl. Symb. 3. 268. (C. marginatus; Deſr. 72. Lam. 2071. Tiru-tali; Rheed. Mal. 11. 109. tab. 53.) "Leaves heart-ſhaped, acute, ſmooth; peduncles many-flowered, ſmooth; ſtem ſomewhat hairy." *Root* perennial, fibrous. *Stems* cylindrical, ſlender, reddiſh. *Leaves* alternate, thin, ſoft, even-ſurfaced, bordered with red; petioles rather long, thick, channelled, reddiſh. *Flowers* pale red, with a purple baſe, funnel-ſhaped; peduncles axillary, ſolitary, thicker than the branches from which they ſpring, ſeven or eight-flowered; calyx-leaves ſhort, ſomewhat acute; ſtigma capitate, two-lobed. A native of the Eaſt Indies. 51. C. *biflorus*. Linn. Sp. Pl. Append. p. 1668. Mart. 16. Willd. 34. "Leaves heart-ſhaped, pubeſcent; peduncles in pairs; corollas with trifid lobes. *Root* annual. *Stem* cylindrical, hairy, branched at the baſe, about the ſize of C. arvenſis. *Leaves* oblong; petioles cylindrical, hairy, ſhorter than the leaf. *Flowers* white; peduncles hairy, approximating at the baſe, ſhorter than the petioles; calyx five-leaved; two outer leaves cordate-oblong; two inner ones linear-lanceolate; the fifth ſemi-heart-ſhaped; corolla ſmall, campanulate, quinquefid, plaited; lobes trifid at the tip; middle lobe ſmaller; tube ſhorter than the calyx; ſtigmas two, capitate, purple. A native of China. 52. C. *gemellus*.

Mart. 95. Deſr. 71. Lam. 2070. Vahl. Symb. 3. 27. Burm. ind. 46. tab. 41. fig. 1. "Leaves heart-ſhaped, ſomewhat villous underneath, peduncles two-flowered." *Stem* tender, pubeſcent at the top. *Leaves* an inch long, obſcurely ſeven-nerved, a little acuminate; petioles the length of the leaves. *Flowers* white; peduncles the length of the petioles; pedicels almoſt as long as the peduncles; one ſhorter, without bractes; the other with two bractes in the middle; both turned back when the fruit ripens; calyx-leaves oblong, obtuſe: corolla campanulate, ſix times as large as the calyx, ſmooth: ſtigma capitate. A native of Java and Tranquebar. 53. C. *triflorus*. Mart. 102. Willd. 42. Vahl. Symb. 5. 30. "Leaves cordate-lanceolate, attenuated, obtuſe, ſmooth; peduncles three-flowered." *Stem* herbaceous, ſmooth. *Leaves* two inches long, quite entire, ſimply veined, rounded at the end and mucronate; lobes rounded at the end, ſometimes but rarely obſcurely angular; petiole ſhort. *Peduncles* ſhorter than the leaf; pedicels angular, without bractes, equal, almoſt the length of the peduncle. *Calyx-leaves* obtuſe. *Corolla* three times the length of the calyx; lobes hairy at the tip. *Stigma* capitate. A native of the Eaſt Indies, obſerved by Koenig. 54. C. *latifolius*. Deſr. 85. Lam. 2083. Plum. Cat. 1. and MSS. "Leaves heart-ſhaped, ſmooth; peduncles about three-flowered; corolla ſalver-ſhaped, very large." *Stems* very long. *Leaves* alternate, large, thin, acuminate, bright green; petioles channelled. *Flowers* white: peduncles axillary, ſolitary, thicker than the petioles, a little angular under the pedicels: calyx-leaves ſmall; three outer ones long, acute; two inner ones egg-ſhaped, obtuſe; tube of the corolla long, narrow, greeniſh; border near five inches in diameter, expanded, almoſt flat, ſlightly ſinuated at the edges, marked with a greeniſh-white ſtar. *Fruit* membranous, top-ſhaped, about the ſize of a walnut. *Seeds* three or four. A native of St. Domingo and Martinico. 55. C. *hypocrateriformis*. Deſr. 84. Lam. 2082. "Leaves heart-ſhaped; corolla ſalver-ſhaped; border five-cleft; ſegments emarginate." *Branches* woody, cylindrical. *Leaves* alternate, near together, about an inch long, coriaceous, ſmooth, ſcarcely pointed; petioles rather ſhorter than the leaves, angular. *Peduncles* axillary, ſolitary, or in pairs, one-flowered, nearly as long as the petioles, thickened upwards; bractes ſituated above the middle of the peduncle, linear-lanceolate, reaching almoſt to the top of the calyx; calyx-leaves ſhort, egg-ſhaped, obtuſe; tube of the corolla near two inches long; border at leaſt an inch and half in diameter, very flat. A native of the Eaſt Indies; deſcribed from an imperfect ſpecimen gathered by Sonnerat. 56. C. *ſtriatus*. Mart. 96. Willd. 36. Vah. Symb. 3. 28. "Leaves heart-ſhaped, attenuated, ſmooth; peduncles longer than the leaf, about four-flowered; corollas ſmooth, ſtriated on the outſide." *Stem* herbaceous, cylindrical, ſlender, pubeſcent. *Leaves* two inches long, remote, quite entire, with a rounded mucronate point, ſmooth on both ſides except the rib, ſimply veined; petioles the length of the leaves, pubeſcent. *Peduncles* longer than the leaves, ſolitary, pubeſcent; pedicels in threes; lateral ones jointed, one of them often two-flowered; intermediate one ſhorter, thicker, without bractes. *Bractes* two, ſituated at the joints about the middle of the lateral pedicels, oblong, concave, ſmall, villous, deciduous. *Calyx-leaves* oblong, obtuſe, concave, equal; two outer ones villous, ſomewhat hoary. *Corolla* campanulate, twice the length of the calyx, white, with a purpliſh baſe and five paler lanceolate-ſtriated rays extending to the margin; ſtigma capitate, two-lobed. 57. C. *domingenſis*. Deſr. 59. Lam. 2058. "Leaves heart-ſhaped; racemes numerous, unilateral; calyx acute, ſmooth." *Stems* ſlender, cylindrical, ſmooth, fruteſcent. *Leaves* alternate, acute, ſmooth, except the middle nerve underneath; petioles of a moderate length, channelled. *Flowers* in ſmall peduncled racemes, numerous, ſituated near the extremities of the branches, often pendant; bractes very ſmall, awl-ſhaped, at the foot of the pedicels; calyx-leaves ſmooth, egg-ſhaped, elongated, unequal in ſize; corollas bell-ſhaped, expanding; ſtigmas capitate, two-lobed. A native of St. Domingo. 58. C. *ſinenſis*. Deſr. 69. Lam. 2068. "Hairy; leaves heart-ſhaped, acute; peduncles two or three flowered; calyx-leaves heart-ſhaped." Whole plant, eſpecially near the ſummit, cloathed with ſeparate, fine, whitiſh hairs. *Stems* ſlender, cylindrical. *Leaves* alternate, entire, on longiſh ſomewhat villous petioles. *Peduncles* ſhorter than the petioles, axillary, ſolitary; bractes ſmall, awl-ſhaped; three exterior calyx-leaves broader than the others, heart-ſhaped at the baſe, very rough with hairs; corollas campanulate, a little longer than the calyx. Suppoſed to be a native of China. 59. C. *pentanthus*. Willd. 37. Jacq. ic. rar. 2. 316. Collect. 14. 210. "Leaves heart-ſhaped, acuminate, ſmooth, ſomewhat repand; umbels peduncled, capitate, five-flowered; calyxes ciliated." *Root* perennial. *Stem* ſhrubby. *Flowers* nearly ſeſſile. Native country unknown. 60. C. *guianenſis*. Mart. 97. Deſr. 58. Lam. 2057. Aubl. guian. 1.136. tab. 52. "Leaves ſomewhat heart-ſhaped, mucronate, tomentous; flowers collected into a kind of corymbous head, on very long peduncles." *Root* perennial. *Stems* a little woody at the baſe, cylindrical, villous. *Leaves* alternate, two inches long, quite entire, veined, nerveleſs; petiole only half the length of the leaf, a little channelled, tomentous. *Flowers* pale blue, or whitiſh; peduncles ſeven inches long, axillary, villous; pedicels very ſhort, intermingled with filiform bractes; calyxes villous, deeply divided into five lanceolate ſegments; corollas ſmall; lobes of the border acuminate; ſtigmas two, reflexed. A native of Guiana. 61. C. *capitatus*. Mart. 98. Deſr. 57. Lam. 2056. Willd. 39. Vahl. Symb. 3. 28. "Hiſpid; leaves heart-ſhaped; flowers capitate, involucred: peduncles ſcarcely longer than the petiole." Whole plant hiſpid, with long diſtinct hairs of a dirty white colour, placed on minute tubercles. *Stem* ſlender, cylindrical. *Leaves* from two to three inches long, alternate, acute, entire; petioles nearly the length of the leaf. *Peduncles* axillary, ſolitary, with about five ſeſſile flowers collected into a cloſe head. *Involucre* conſiſting of ſix or ſeven egg-ſhaped acute bractes, of unequal ſize, generally as long as the calyx: calyx-leaves one third of the length of the corolla, ovate-lanceolate, acuminate, ſmooth within; corolla hiſpid on the outſide with long hairs arranged in five lines. *Capſule* globular, ſhorter than the calyx, even-ſurfaced, ſmooth. Found in the Eaſt Indies by Koenig and in Senegal by Geoffroy. 62. C. *crinitus*. Deſr. 112. Lam. 2114. "Leaves heart-ſhaped, almoſt ſmooth; heads of flowers very hirſute, on long peduncles, involucred; capſule even-ſurfaced." *Stem* herbaceous. Specimen in the herbarium of Juſſieu. 63. C. *hiſpidus*. Mart. 99. Willd. 40. Vahl. Symb. 3. 29. "Extremely hirſute; leaves cordate-egg-ſhaped; flowers umbelled; peduncles very ſhort." *Leaves* from two to three inches long, attenuated, quite entire; petiole half the length of the leaf. *Pedicels* the length of the peduncle. *Calyx-leaves* lanceolate, attenuated, ſmooth within, lax. *Corolla* ſmooth. *Stigma* capitate. A native of the Eaſt Indies. 64. C. *parviflorus*. Mart. 100. Willd. 42. Vahl. Symb. 3. 29. (Ipomœa paniculata; Burm. Ind. 50. tab. 21. fig. 3.) "Leaves heart-ſhaped, acuminate, ſmooth; peduncles many-flowered; calyxes acuminate, villous." *Stem* weak, ſlightly villous at the top.

Leaves an inch long; petiole the length of the leaf, filiform, villous. *Flowers* blue; peduncles the length of the petioles; pedicels umbelled; lateral ones ſometimes branched; calyx-leaves egg-ſhaped, acuminate, ſmall; corolla ſmooth, twice the length of the calyx, five-cleft; ſtigma bifid; ſegments revolute. A native of Java. 65. C. *verticillatus*. Linn. 12. Mart. 17. Willd. 43. Brown. Jam. 153. (C. nodiflorus, Lam?) "Leaves oblong, heart-ſhaped, oblong, naked; peduncles umbelled, bifid, many-flowered." *Leaves* roughiſh, ſomewhat repand. *Flowers* blueiſh, ſmall, campanulate, not cut; peduncles ſhorter than the leaf; pedicels often ſomewhat divided. A native of North America. 66. C. *ſolanifolius*. (C. parviflorus; Deſr. 66 Lam. 2065. Quamoclit purpurea ſolanifolia minor; Plum. MSS. 2. tab. 62. Burm. Amer. 83. tab. 94. fig. 2.) "Leaves cordate-oblong, mucronate; peduncles branched, many-flowered, ſhort, appearing verticillate." Diſtinct from the preceding. *Roots* the thickneſs of the human little finger, much branched. *Stems* very ſlender, long, branched. *Leaves* ſinuated, ſlightly tomentous; petioles rather ſhort. *Flowers* purpliſh, ſmall, campanulate, deeply five-cleft, as repreſented in Plumier's figure; peduncles axillary, ſhorter than the leaves; pedicels forming a corymb. *Capſules* four-celled. *Seeds* yellow, angular. A native of St. Domingo, on ſtony hills, communicated to La Marck by Joſeph Martyn. 67. C. *violaceus*. Mart. 101. Willd. 44. Vahl. Symb. 3. 29. "Leaves cordate-egg-ſhaped, acute: peduncles elongated, bifid, many-flowered; two outer calyx-leaves cordate-egg-ſhaped, acute." *Stem*, *petioles*, *peduncles*, and *calyxes* villous. *Leaves* an inch long. *Flowers* violet, with five lanceolate paler rays; peduncles four or five times longer than the leaf; pedicels three or five-flowered, with a pair of linear-lanceolate bractes at the baſe; calyx-leaves tender; two innermoſt ones only half the ſize of the others, ſomewhat membranous, ſmooth, mucronate; corolla campanulate; ſtigmas two, reflexed. It varies with reſpect to the hairineſs of the leaves. A native of the iſland of Santa Cruz. 68. C. *azureus*. Deſr. 56. Lam. 2055. "Leaves ſomewhat heart-ſhaped, acute, naked; flowers collected into a head on a very long petiole." *Stem* woody, finely ſtriated, firm and greyiſh near the bottom, twining and ſomewhat villous towards the top. *Leaves* near an inch and half long, a little longer than the petioles, repand, ſmooth, rather glaucous underneath. *Flowers* fine azure blue, ſmall; peduncles axillary, ſolitary, divided at the ſummit into ſhort ramifications intermingled with ſmall bractes; calyxes deeply divided; ſegments acute. A native of South America. 69. C. *cymoſus*. Deſr. 64. Lam. 2063. (C. lævis minor; Rumph. Amb. 5. 451. tab. 158.) "Leaves heart-ſhaped, oblong, acuminate; peduncles cymous; fruit nodding." *Stems* long, ſlender, cylindrical, almoſt ſmooth. *Leaves* four or five inches long, alternate, petioled, nerved, even-ſurfaced, ſlightly ſinuated. *Peduncles* axillary, about the length of the petioles, branched about the middle into a cyme. *Calyx-leaves* egg-ſhaped, obtuſe. *Corollas* long, not very open. *Stigma* capitate, two lobed. A native of the Eaſt Indies. 70. C. *umbellatus*. Linn. Sp. Pl. 13. Mart. 18. Deſr. 63. Lam. 2062. Willd. 45. (C. luteus polyanthos; Plum. Am. 88. tab. 102. Sloan. Jam. 53.) "Leaves heart-ſhaped; petioles ſtipulaceous at the baſe; peduncles umbelled." *Root* perennial. *Stem* herbaceous, cylindrical, filiform, ſtiff, ſubdivided, pubeſcent. *Leaves* above two inches long, and as broad at the baſe, deeply heart-ſhaped, lanceolate, ſomewhat ſinuated, entire, dark green, hoary underneath; petioles three inches long, with two ſtipules at the baſe a little decurrent on the ſtem. *Flowers* yellow; peduncles three inches long or more; partial peduncles three quarters of an inch long, three-flowered; each flower on a pedicel longer than the partial peduncles; two of the calyx-leaves a little ſhorter than the reſt; ſtigma bifid, globular. *Capſule* two-celled. *Seeds* one or two in each cell, covered with a velvety down. A native of the Weſt Indies. 71. C. *multiflorus*. Mart. 69. "Leaves heart-ſhaped, ſmooth; peduncles many-flowered. *Seeds* villous, ferruginous. *Root* annual. *Stems* eight or ten feet high, ſlender. *Leaves* ſhaped like thoſe of C. ſepium. *Flowers* purple, on rather long peduncles, growing in bunches. *Capſules* trigonous, three-celled, with one ſeed in each cell. A native of Jamaica. Linnæus quotes Plukenet's Alm. tab. 167. 1. for the preceding ſpecies; Miller for the preſent. 72. C. *tuguriorum*. Mart. 73. Willd. 46. Forſt. Prod. 35. "Leaves cordate-arrow-ſhaped, acute; ſtem angular; peduncles tetragonal, one-flowered." A native of New-Zealand. 73. C. *buſalinus*. Mart. 77. Lour. Cochin. 109. "Stem ſhrubby; leaves cordate-arrow-ſhaped, ſmooth; peduncles many-flowered; anthers ſpiral." *Stem* large, ſhrubby, branched, ſmooth. *Leaves* alternate, petioled. *Flowers* yellow, large, campanulate; anthers filiform. *Capſule* two-celled, with one ſeed in each cell. A native of the woods of Cochinchina. 74. C. *cordifolius*. Willd. 47. Thunb. Prod. 35. "Leaves heart-ſhaped, haſtate, toothed; peduncles bifid-umbelled." A native of the Cape of Good Hope. 75. C. *roſeus*. Mart. 71. Houſt. MSS. "Leaves heart-ſhaped, acuminate; peduncles two-flowered." *Root* annual. *Stem* ſeven or eight feet high. *Leaves* on very long petioles. *Flowers* large, of a fine roſe colour, on long peduncles. *Seeds* large, covered with a fine down. A native of Jamaica, cultivated by Miller. 76. C. *bifidus*. Mart. 103. Willd. 48. Vahl. Symb. 3. 30. (C. lævis mas; Rumph. Amb. 5. 431.) "Leaves heart-ſhaped, oblong, acuminate, very ſoft underneath; peduncles bifid, many-flowered." β lævis minor; Rumph. 5. 431. tab. 158. "Leaves heart-ſhaped, lanceolate-oblong, ſmooth." *Stem* villous. *Leaves* from two to three inches long, an inch wide at the baſe, mucronate; petiole one-third of the length of the leaf, hoary. *Peduncles* axillary, ſolitary; pedicels numerous, ſomewhat umbellated, oblong, ferruginous, deciduous, with minute ſcales at the baſe inſtead of bractes. *Calyx-leaves* pubeſcent at the baſe, rounded at the tip, equal. *Corolla* almoſt funnel-ſhaped, three times the length of the calyx, with five ſlender villous lines on the outſide; lobes acute, bearded at the tip. *Stigma* capitate, two lobed. *Capſule* egg-ſhaped, ſtriated, ſmooth. It has the habit of C. umbellatus, but has ſmaller narrower leaves. The variety differs only in the ſmoothneſs, and its narrow leaves. 77. C. *malabaricus*. Linn. Sp. Pl. 14. Mart. 19. Deſr. 68. Lam. 2067. Willd. 49. (Katta-kelengu; Rheed. Mal. 11. 105. tab. 51.) "Leaves heart ſhaped, ſmooth; ſtem perennial, villous." *Root* perennial. *Stem* ſomewhat woody, cylindrical, weak, villous. *Leaves* alternate, acute, quite entire; petioles reddiſh, thicker than the ſtem. *Flowers* yellowiſh white, with a deep purple baſe; peduncles axillary, ſolitary, cylindrical; bractes narrow, ſituated near the calyx; calyx five-leaved; leaves acute, three outer ones larger; corolla campanulate, open, villous on the outſide; ſtigma capitate; two-lobed. A native of the coaſt of Malabar. 78. C. *cæleſtis*. Mart. 74. Lam. 2112. Willd. 50. Forſt. Flor. Auſt. 77. "Leaves heart-ſhaped, very acuminate, pubeſcent; peduncles elongated, umbellate-trifid" A native of the iſland of Tanna in the South Seas. 79. C. *canarienſis*. Linn. Sp. Pl. 15. Mart. 20. Deſr. 65. Lam. 2064. Willd. 51. Comm. Hort. 2. 101. tab. 51. Pluk. Alm. 114. tab. 325. fig. 1. "Leaves heart-ſhaped, acute, ſomewhat tomentous, ſoft; peduncles axillary, about three-flowered, rather long." *Root* perennial. *Stems* woody, twenty feet high or more, cylindrical, a little branched, woolly. *Leaves* alternate, not deciduous, whitiſh underneath, on ſhort tomentous petioles. *Flowers* purple-violet or pale blue, ſometimes white; peduncles axillary, longer than the petioles, tomentous; pedicels three, rarely five or ſix, ſhort, intermingled with filiform bractes; calyxes very villous, with five deep acute ſegments; corollas a little villous on the outſide; border almoſt flat; ſtigmas bifid, filiform. A native of the Canary Iſlands. 80. C. *pannifolius.* Saliſb. Par. Lond. tab. 20. "Stem angular; leaves haſtate-wedge-ſhaped, ſhaggy, with hairs on both ſides; peduncles two or three-flowered; tube of the corolla a line and half long; ſegments ſomewhat mucronate; pericarp tender, hairy." *Leaves* pale green, halberd-ſhaped, very hairy on both ſides, like a piece of woollen cloth. *Flowers* pale purple, with a darker baſe; bractes narrow, attenuated; calyx hairy; margin of the corolla and the wedge-ſhaped folds of its border pubeſcent; filaments white, covered with a glandular pubeſcence towards the bottom; anthers blue; nectary yellow, with a whitiſh margin; ſtyle white, about three lines long; ſtigmas white, longer than the ſtyle, ſpreading out wide, quite linear, obtuſe. *Capſule* two-celled. *Seeds* two in each cell. Raiſed from ſeeds received from Liſbon by Meſſrs. Lee and Kennedy. 81. C. *ferrugineus.* Willd. 52. Vahl. Eclog. 1. 17. "Ferruginous-downy; leaves heart-ſhaped, acute; peduncles axillary, four-flowered." *Root* perennial. A native of South America. 82. C. *muricatus.* Linn. Mant. 44. Mart. 21. Deſr. 73. Lam. 2072. Willd. 53. "Leaves heart-ſhaped; peduncles thickened, and, as well as the calyxes, even-ſurfaced; ſtem muricated." Reſembling C. purpureus, but the ſtem has a very even ſurface, with harmleſs prickles ſcattered over it. *Root* annual. *Flowers* purple; peduncles often two-flowered; corolla more funnel-ſhaped than that of C. purpureus. Diſtinct from ipomæa bona nox, A native of Surat; introduced into England by Dr. Solander; flowering in July and Auguſt. 83. C. *anceps.* Linn. Mant. 43. Mart. 22. Willd. 54. "Leaves heart-ſhaped; ſtem keeled on both ſides." *Stem* ſmooth, winged from leaf to leaf with two decurrent membranes. *Leaves* three inches long, ſmooth, veined, obtuſe, quite entire; petioles nearly the length of the leaf; peduncles axillary, the length of the petioles, thicker, four or five-flowered, villous; pedicels thickened, ſomewhat umbelled, villous; bractes two, at the baſe of the calyx, broad, egg-ſhaped, membranous, mucronate, villous, deciduous; two outer calyx-leaves egg-ſhaped, villous on the outſide, ſmooth within, mucronate; inner ones only half the ſize, oblong; corolla twice as long as the calyx, bell-ſhaped; ſtigma capitate. A native of Ceylon and Java. 84. C. *triqueter.* Mart. 104. Willd. 54. Vahl. Symb. 3. 30. "Leaves heart-ſhaped, acute, ſomewhat villous; peduncles many-flowered; ſtem three-keeled." *Stem* pubeſcent. *Leaves* two inches long and more; petiole villous, ſhorter than the leaf. *Peduncle* the length of the leaves, three or five-flowered; lateral pedicels often two-flowered; middle one one-flowered, ſhorter, gradually thickened; bractes at the baſe of the pedicels, egg-ſhaped, concave, tender, acute, mucronate, coloured, pubeſcent, deciduous; two outer calycine leaves reſembling bractes, egg-ſhaped, acute, mucronate, ſilky; inner ones ſhorter, ſmooth, rounded at the tip; ſtigma capitate. Nearly allied to the preceding, but the leaves are not obtuſe, and the rings on the ſtem much narrower. A native of the iſland of Santa Cruz. 85. C. *Turpethum.* Linn. Sp. Pl. 17. Mart. 23. Deſr. 86. Lam. 2084. Willd. 56. (Turpethum; Bauh. Pin. 149. C. zeylanicus alatus; Herm, Lugdb. 177. tab. 178, 179.) "Leaves heart-ſhaped, angular; ſtem membranous, quadrangular; peduncles many-flowered." *Root* perennial, about an inch thick, little branched, ſtriking deep into the ground, throwing out thick fleſhy tubers, abounding in a milky juice, which ſoon hardens into a reſinous ſubſtance when expoſed to the air. *Stems* woody and reddiſh near the bottom, ſlender, with four decurrent wings, branched. *Leaves* alternate, crenulate, ſoft, clothed with a thin whitiſh down, ſlightly mucronate; petioles ſhorter than the leaves, winged, channelled. *Flowers* white, reſembling thoſe of C. ſepium; peduncles longer than the petioles, axillary, ſolitary, trifid; pedicels one or two-flowered; bractes two, egg-ſhaped, at the baſe of the calyx; two outer calyx-leaves egg-ſhaped, villous; three inner ones ſmooth; anthers ſpiral; ſtigma capitate, two-lobed. *Capſule* membranous, globular-depreſſed, two-celled. *Seeds* one or two in each cell, black, angular on one ſide. A native of Malabar, Ceylon, the Society and Friendly Iſles, and the new Hebrides. For an account of the medicinal qualities of the root, ſee TURBITH. 86. C. *grandiflorus.* Linn. jun. Sup. 136. Mart. 24. Deſr. 14. Lam. 2013. Jacq. Hort. 3. tab. 69. (Munda-valli; Rheed. Mal. 11. 103. tab. 50.) "Leaves cordate-egg-ſhaped, rather obtuſe, quite entire; peduncles generally two-flowered; calyxes coriaceous; ſtem and petioles pubeſcent." Linn. jun. "Leaves heart-ſhaped, acute, on long petioles; peduncles ſhort, one-flowered; corollas very large, funnel-ſhaped." Lam. *Root* perennial. *Stem* woody at the baſe, cylindrical, branched, ſmooth, about twelve feet high. *Leaves* large, with rounded lobes, ſmooth. *Flowers* very white, ſweet-ſcented. A native of the Eaſt and Weſt Indies. 87. C. *ſpecioſus.* Linn. Sup. 137. Mart. 26. Willd. 58. (C. nervoſus; Deſr. 87. Lam. 2085. Burm. Ind. tab. 20. Samudra-ſtjogam; Rheed. Mal. 11. 125. tab. 61.) "Leaves heart-ſhaped, tomentous-ſilky underneath; peduncles longer than the petioles, umbelliferous; calyxes acute." Hort. Kew. *Root* perennial. *Stem* woody at the bottom, pubeſcent, branched; branches clothed with a thick white cottony down. *Leaves* alternate, large, acute, quite entire, nerved underneath; petioles and peduncles tomentous. *Flowers* purpliſh, more than two inches long; pedicels five or ſix, very ſhort; bractes elliptical, longer than the calyx; calyxes ſmall, deeply divided into five egg-ſhaped ſegments. A native of the Eaſt Indies. 88. C. *trinervius.* Mart. 27. Deſr. 16. Lam. 2015. Willd. 59. Thunb. Flor. Jap. 85. "Leaves heart-ſhaped, oblong, ſmooth, three nerved; ſtem cylindrical; peduncles one-flowered." *Stem* filiform, ſimple, ſmooth. *Leaves* about an inch long, oppoſite, acuminate, quite entire, paler underneath; petioles linear, ſmooth, half an inch long. *Flowers* purpliſh; peduncles axillary, ſolitary, or in pairs, very ſhort; ſegments of the calyx almoſt briſtle-ſhaped, ſmooth, half the length of the corolla; ſtigmas capitate, two-lobed. A native of Japan. Deſrouſſeaux obſerves, that the ſingularity of the oppoſite leaves renders the genus dubious. 89. C. *peltatus.* Linn. Sp. Pl. 16. Mart. 28. Deſr. 88. Lam. 2086. Willd. 60. Rumph. Am. 5. tab. 157. "Leaves target-ſhaped; peduncles many-flowered." *Stem*, according to Rumphius, ſometimes as thick as the human thigh, and climbing to the top of the higheſt trees. *Leaves* alternate, large, ſomewhat acute, ſmooth; petioles rather long, zig-zag. *Flowers* white or faint purple, bell-ſhaped, twice the length of the calyx; peduncles axillary, ſolitary; calyx-leaves egg-ſhaped, ſmooth. A native of Amboina. 90. C. *Jalapa.* Linn. Mant. 43. Mart. 29. Deſr. 13. Lam. 2112. Willd. 61. Woodv. Med. Bot. tab. 21. Lam. Ill. tab 104. fig. 2. (Bryonia mechoacana nigricans; Bauh. Pin. 298.) "Leaves egg-ſhaped, ſomewhat heart-ſhaped, obtuſe, obſoletely repand, villous underneath; peduncles one-flowered." Hort. Kew. *Root* perennial, thick, blackiſh on the outſide, whitiſh within, abounding in a milky juice. *Stems* numerous, herbaceous, ten or twelve feet high. *Leaves* ſmooth, different in ſhape, lower ones triangular, almoſt heart-ſhaped; upper ones more oblong and acute; petioles long. *Flowers* reddiſh on the outſide, dark purple within (yellow in the Kew Garden); peduncles axillary, ſolitary. *Seeds* covered with a very white cottony down. A native of South America, about Xalapa, between La Vera Cruz and Mexico. For its medicinal qualities, ſee JALAP. 91. C. *macroſpermus.* Willd. 62. (Mouroucoa violacea; Aubl. guian. 1. 142. tab. 54. Juſſ. 133.) "Leaves elliptical, acute, ſmooth; corollas flat; capſules two or three-celled, with one ſeed in each cell." *Root* perennial. *Flowers* ſalver-ſhaped. *Seeds* almoſt an inch and half thick. A native of Guiana. 92. C. *tenellus.* Willd. 63. Deſr. 78. Lam. 2076. Pluk. Almag. 114. Phyt. tab. 166. fig. 4. "Leaves oblong-elliptical, obtuſe, mucronate, nearly ſeſſile; peduncles longer than the leaf, generally two-flowered." One of the leaſt ſpecies of the genus. *Stem* filiform, a little villous. *Leaves* alternate, ſcarcely an inch long, and about three lines broad, entire. *Peduncles* axillary, ſolitary; bractes two, awl-ſhaped, at the baſe of the pedicels; corollas ſmall, bell-ſhaped. A native of Carolina and Virginia. 93. C. *Barbudenſis.* (C. glaber Mill. Mart. 68.) "Leaves ovate-oblong, ſmooth; peduncles one-flowered; calyxes ten-cleft." *Root* annual. *Stems* eight or ten feet high. *Flowers* purple, large, on long ſlender peduncles. Sent to Miller from the iſland of Barbuda. 94. C. *ſericeus.* Linn. Mant. 43. Deſr. 77. Lam. 2075. (C. mollis; Burm. Ind. 44. tab. 7.) "Leaves lanceolate-elliptical, tomentous-ſilky underneath; peduncles about three-flowered; calyx ſhort, hairy." *Stems* ſhrubby, ſmooth. *Leaves* alternate, petioled. *Peduncles* axillary, ſolitary, about the length of the petioles. Calyx-leaves egg-ſhaped, whitiſh, ſilky. Tube of the corolla narrow to the top of the calyx, afterwards widened and terminating in a purple border, covered on the outſide with white hairs. *Capſules* downy. A native of the iſland of Java. 95. C. *tomentoſus.* Linn. Sp. Pl. 18. Mart. 31. Deſr. 93. Lam. 2091. Willd. 65. Sloan. Jam. 55. hiſt. 1. 134. tab. 98. fig. 2. Pluk. alm. 115. tab. 167. fig. 4. "Leaves three-lobed, tomentous; ſtem lanuginous." *Stem* twenty feet high, cylindrical, whitiſh. *Leaves* alternate, reſembling the older leaves of ivy; petioles three quarters of an inch long. *Flowers* purple; peduncles axillary, ſolitary, many-flowered, a quarter of an inch long; corollas bell-ſhaped. *Capſule* ſpheroidal, acuminate, two-celled. *Seeds* one in each cell, black. A native of Jamaica. 96. C. *quinqueflorus.* Mart. 105. Willd. 66. Vahl. Symb. 3. 31. "Leaves ſagittate-egg-ſhaped, attenuated, ſmooth, crenate, ſomewhat repand; peduncles about five-flowered." *Stem* ſlightly pubeſcent, cylindrical, branched. *Leaves* tender, hoary; petiole ſhorter than the leaf. *Peduncles* the length of the leaves, pubeſcent. Pedicels in threes, umbelled, lateral ones in the greater number bifid, but on the peduncles near the top all ſimple, bractes two, linear, at the baſe of the lateral pedicels; calyx-leaves oblong, obtuſe, mucronate, ſomewhat villous; corolla twice as long as the calyx; lobes bearded at the tip; ſtigma bifid. Suppoſed to be a native of the iſle of Bourbon. 97. C. *crenatus.* Deſr. 74. Lam. 2073. Jacq. ic. rar. 2. tab. 315. (C. Hermanniæ; Willd. 67. L'Herit. ſtirp. 1. 67. tab. 33.) "Tomentous; leaves cordate-oblong, obtuſe, ſomewhat repand; peduncles longer than the petiole; border of the corolla acute." *β*. eroſus. "Leaves leſs elongated, appearing bitten here and there at the edge, cloathed with a reddiſh down; flowers larger." Whole plant whitiſh, ſoft to the touch. *Root* perennial, ſpindle-ſhaped. *Stems* about three feet long, not much branched. *Leaves* alternate, on ſhort petioles. *Flower* white, ſmall; peduncles long, zig-zag, with two ſmall awl-ſhaped bractes near the top, often two-flowered; border of the corolla ſlightly crenulate, with five acute diviſions. Found in Peru by Dombey. The variety *β* found at Monte Video by Commerſon. 98. C. *althæoides.* Linn. Sp. Pl. 19. Mart. 32. Deſ. 97. Lam. 2095. Willd. 69. Flor. Gr. tab. 194. Bauh. Pin. 295. Moris. hiſt. 2. 13. tab. 3. fig. 10. (C. peregrinus, folio betonicæ; Tourn. 85.) "Lower leaves heart-ſhaped, ſinuated; upper ones pinnatifid, ſomewhat palmate; peduncles generally two-flowered." Lam. *β*. C. Bryoniæfolius; Bot. Mag. 943. *Root* perennial. *Stems* a foot and half or two feet high, ſarmentous, weak, cylindrical. *Leaves* alternate. *Flowers* reddiſh, large, very open, almoſt entire; peduncles longer than the leaves, with two filiform bractes above the middle. The whole plant cloathed with numerous hairs, ſo as to give it a ſilky aſpect. A native of the Levant, Africa, and the South of Europe. The variety *β* is a much more robuſt plant; its leaves have no ſilkineſs or ſilvery whiteneſs; its flowers are larger and deeper coloured. Raiſed from ſeeds procured from China, by Iſaac Swainſton, eſq. in 1802. 99. C. *tenuiſſimus.* Smith Prod. Flor. Græc. p. 134. Fl. Græc. tab. 195. (C. althæoides *β*. Linn. *γ*. Deſr. C. althæoides; Bot. Mag. 359? C. argenteus elegantiſſimus foliis tenuiter inciſis; Tourn. Inſt. 85.) "Leaves pedate, ſilky, remarkably ſhining; linear lobes obtuſe; root-leaves cordate-ſerrated; peduncles one-flowered." Found by Dr. Sibthorp in Candia, about Athens and in the iſland of Zante. 100. C. *alceifolius.* Lam. 2096. "Hirſute; all the leaves deeply divided, ſomewhat palmate; peduncles few-flowered, longer than the leaves." A native of the Cape of Good Hope. 101. C. *cairicus.* Linn. Sp. Pl. 21? Mart. 33. Willd. 70. Bot. Mag. 699. (C. foliis lanceolatus vel quinquefolius; Bauh. Pin. 295. Barrel. icon. 319 and 320. C. ægyptius; Veſling Ægyp. 73. tab. 74. Ipomæa palmata; Forſk. Deſc. 43.) "Stem ſhrubby; leaves palmate-cleft, mucronate, ſmooth, quite entire, but often minutely crenate; hinder leaflets two-lobed: ſtipules palmate; calyxes even-ſurfaced; corollas ribbed underneath; diviſions acute." *Root* perennial. *Stem* with many ſlender branches. *Leaves* alternate; ſegments lanceolate; petioles the length of the leaves, with two leaf-like ſtipules at the baſe. *Flowers* violet-purple, large; peduncles the length of the petioles, axillary, from one to three-flowered; pedicels bracteated about the middle, with two ſmall, egg-ſhaped, acute ſcales; calyx five-leafed; leaves ſhort, egg-ſhaped, acute, concave, ſmooth, very ſhining either ſide; tube of the corolla nearly cylindrical, contracted as far as the calyx; border ſpreading; filaments unequal; anthers ſomewhat arrow-ſhaped: ſtigma divided into furrowed lobes. A common ornamental plant in the gardens of Egypt. 102. C. *quinquelobus.* Mart. 107. Willd. 71. Vahl. Symb. 3. 32. "Leaves palmate-quinquelobed, finely ſerrulated, obtuſe, ſmooth; axils tomentous; peduncles one-flowered; ſtem ſmooth." *Stem* cylindrical. *Leaves* nerved, finely veined, mucronate; middle lobe ſcarcely an inch long, lateral ones ſmaller, and narrower; petioles an inch long, filiform; ſtipules two, axillary, petioled, ſimilar in ſtructure to the leaves. *Flowers* purple; peduncles the length of the petioles, filiform, without bractes; calyx-leaves oblong, obtuſe, ſmooth; ſtigma capitate, two-lobed. A native of the iſland of Santa Cruz. 103. C. *copticus.* Linn. Mant. 559. Mart. 34. Willd. 72. (C. ſtipulatus; Deſr. 26. Lam. 2025. C. foliis laciniatis, vel quinquefolius; Bauh. Pin. 295. Barrel. icon. 319.) "Leaves pedate, ſerrated; peduncles enſiform, one or two-flowered; calyxes muricated." *Root* annual. *Stem* angular, ſmooth, and even-ſurfaced. *Leaves* ſmooth, deeply divided almoſt to the baſe; ſegments five, lanceolate, ſerrated or unequally toothed, mucronate by the middle nerve; lateral ones ſenſibly ſhorter; two external ones often bifid. Petioles long, channelled, ſcabrous underneath; ſtipules ſimilar to the leaves, but ſmaller. *Flowers* ſmall, white; peduncles axillary, compreſſed, longer than the petioles, thickened upwards, with two bractes above the middle. A native of the Levant. 104. C. *laciniatus*. Deſr. 27. Lam. 2026. "Leaves finely laciniated, ſomewhat bipinnated; peduncles one or two-flowered; calyx of the fruit nearly naked." About a foot and half high, ſometimes perfectly ſmooth, ſometimes cloathed with fine ſilky hairs. *Stems* ſlender, cylindrical. *Leaves* alternate, petioled. *Flowers* white; peduncles ſlender, longer than the petioles, axillary, ſolitary, thickened upwards; bractes two, about a line and half long, linear, acute, ſituated near the top of the peduncles; calyx-leaves egg-ſhaped, obtuſe, mucronate, a little ſcarious, ſometimes rather villous, eſpecially at the time of flowering; corollas campanulate, twice the length of the calyxes. *Seeds* black, naked. A native of South America, about Monte Video. Specimen in the herbarium of Commerſon. There is a variety in the herbarium of Thouin very villous in all its parts, eſpecially the calyxes, with the lower leaves leſs deeply divided, than the upper. 105. C. *vitifolius*. Linn. Mant. 203. Mart. 35. Deſr. 99. Lam. 2099. Willd. 73. Burm. Ind. 45. tab. 18. fig. 1. Pluk. alm. 135. tab. 25. fig. 3. "Leaves palmate-five-lobed, ſmooth, toothed; ſtem hairy; peduncles many-flowered." *Stems* villous. *Leaves* alternate, petioled, divided almoſt to the middle, hoary underneath. *Peduncles* axillary, ſolitary, hairy, ſeparating into two principal branches; calyxes villous; corollas campanulate, orange; ſtigmas two, globular. A native of the Eaſt Indies. 106. C. *diſſectus*. Linn. Mant. 204. Mart. 36. Deſr. 23. Lam. 2022. Willd. 74. Jacq. ob. 2. 4. tab. 28. Hort. 2. tab. 159. "Leaves palmate, ſeven-cleft, dentate-ſinuated, ſmooth; ſtem hairy; peduncles one-flowered." *Root* annual. *Stem* much branched, cylindrical. *Leaves* deeply palmate, almoſt digitate, ſegments acute; petioles from one to two inches long, hairy. *Flowers* white, open; peduncles ſhorter than the leaves, axillary, ſolitary, hairy at the baſe; calyx oblong, ſmooth and even-ſurfaced; ſtigma capitate, two-lobed. A native of America. 107. C. *mucronatus*. Mart. 75. Willd. 75. Forſt. prod. 79. "Leaves palmate-pedate; lobes ciliated, mucronate; peduncles one-flowered." A native of the Iſle of Tanna in the ſouth ſeas. 108. C. *macrocarpus*. Linn. Sp. 20. Mart. 37. Deſr. 24. Lam. 2023. Willd. 76. (C. polyphyllus, flore & fructu purpureis maximis; Plum. Cat. 1. MSS. 2. tab. 56. Burm. Amer. 8. 50. tab. 91. fig. 1.) "Leaves palmate, pedate, five-cleft; peduncles one-flowered." *Root* annual, thick, fleſhy, milky. *Stems* long, about the thickneſs of a gooſe-quill. *Leaves* deeply palmate, almoſt digitate, two outer ſegments leſs deeply divided, thin, ſmooth, on rather long petioles. *Flowers* purple; peduncles a little longer than the petioles, axillary, thickened upwards, jointed and bent above the middle, longitudinally winged and curled; calyx-leaves concave, roundiſh; corollas campanulate, large, ſlightly ſinuated. *Capſule* membranous, orbicular, angular, about the ſize of a walnut. *Seeds* round, black, villous, about the ſize of a hazel-nut. A native of Martinico, where its root is eſteemed purgative. 109. C. *paniculatus*. Linn. Sp. Pl. 23. Mart. 38. Deſr. 100. Lam. 2100. Willd. 77. (Pal modecca; Rheed. mal. 11. 101. tab. 49.) "Leaves palmate; lobes ſeven, egg-ſhaped, acute, quite entire; peduncled, panicled." *Root* perennial, about a foot and half long, thick, tuberous. *Stems* ſlender, even-ſurfaced. *Leaves* alternate, petioled, rarely three or five-lobed. *Flowers* very open, pale red on the outſide, purple within, deeper coloured at the bottom; peduncles axillary, ſolitary, reddiſh, a little curved; calyx-leaves rounded, appearing bliſtered, dull-red, connivent after the fall of the flower. A native of the coaſt of Malabar. 110. C. *palmatus*. Mart. 66. (C. pentaphyllos, folio glabro dentato, viticulis hirſutis, Plum. Cat. C. pentaphyllus β. ſerpens. Linn. "Leaves palmate; lobes ſeven, ſinuate-pointed; peduncles one-flowered; calyxes very large, ſpreading." Stem twenty feet high, dividing into ſeveral ſmaller ones. *Flowers* large, purple, on long peduncles. *Capſules* large, roundiſh, three-celled. *Seeds* one in each cell. A native of La Vera Cruz in New Spain, whence ſeeds were ſent to Miller by Dr. Houſton. 111. C. *aggregatus*. Mart. 78. Lour. Cochinch. 109. "Leaves palmate, ſeven-lobed, hairy; flowers aggregate." *Stem* perennial, cylindrical, extremely hairy, branched. Lobes of the leaves egg-ſhaped, rather acute, quite entire. *Flowers* white, large, on a long, ſolitary, axillary peduncle; common calyx (involucre?) twelve-leaved, bell-ſhaped; leaves ovate-oblong, unequal, hairy, containing about ten ſeſſile florets; proper calyx-leaves lanceolate, hairy, upright; corolla tubular, five-cleft; ſegments acute, hairy, cloſed; anthers bifid at the baſe; ſtyle longer than the corolla; ſtigma capitate. *Capſule* two-celled, two-ſeeded. Seeds round on one ſide, angular on the other. A native of Cochinchina. 112. C. *tuberculatus*. Deſr. 25. Lam. 2024. "Leaves digitate, ſomewhat pedate, ſeven-cleft, ſmooth; petioles rough with tubercles; peduncles one-flowered." *Stems* ſeveral, two or three feet high, ſlender, cylindrical, ſarmentous. *Leaves* alternate; ſegments egg-ſhaped, entire, lanceolate, ſlightly obtuſe, mucronate; petioles about two inches long, channelled, tubercled on their convex ſide, ſtipules digitate. *Flowers* large, purple; peduncles axillary, thickened upwards; furniſhed near the bottom with two ſmall glandular points, which riſe from a kind of knot; calyxes deeply divided; ſegments egg-ſhaped, obtuſe, ſomewhat ſcarious at the edges; corollas funnel-ſhaped, almoſt campanulate, very open; ſtigma two-lobed. Found in South America, about Monte Video, by Commerſon. Cultivated in the Botanic garden at Paris. 113. C. *macrorhizos*. Linn. Sp. Pl. 22. Mart. 39. Deſr. 106. Lam. 2107. Willd. 78. (C. coccineus heptaphyllus, radice craſſiſſima; Plum. Cat. 1. MSS. 2. tab. 58 Burm. Amer. 79. tab. 90. fig. 1.) "Leaves digitate in ſevens, quite entire; ſtem ſmooth; peduncles many-flowered." *Root* very thick, tuberous, ſweet-taſted, abounding in a milky juice, eſteemed purgative. *Stems* ſarmentous, deep green, about the ſize of a finger, branched, climbing to the top of the higheſt trees. *Leaves* on long purpliſh petioles, bright green; ſegments about three inches long, oval-lanceolate, acute, ſlightly ſinuated, ſmooth; mid-rib purple underneath. *Flowers* large, ſcarlet; peduncles axillary, ſolitary, ſhort, ſlender; corollas bell-ſhaped, tubular at the baſe; border open, ſlightly crenate; ſtigma capitate. A native of St. Domingo. 114 C. *pentaphyllus*. Linn. 24. Mart. 41. Deſr. 101. Lam. 2101. Willd. 82. (C. pentaphyllos hirſutus; Plum. Cat. 1. MSS. 2. tab. 54. C. americanus pent. & heptaphyllus major; Herm. lugbd 183. tab. 185. Tourn. 84. Ipomæa pentaphylla; Jacq. Col. 2. 297. ic. rar. 2. tab. 319.) "Very hairy; leaves digitate, in fives; leaflets egg-ſhaped, acuminate; peduncles many-flowered." Stems, petioles, peduncles, and calyxes rough with numerous long, ſtiff, reddiſh hairs. *Root* annual, long, ſlender, fibrous. *Stem* generally ſingle, ſometimes thirty-eight feet high, cylindrical, branched, about the ſize of the human little finger, cinereous brown, woody and ſmooth at the baſe, reddiſh above, green near the top. *Leaves* alternate, petioled; ſegments quite entire, cloathed on both ſides with fine decumbent hairs. *Flowers* yellowiſh white; peduncles about four inches long, axillary, ſolitary, cylindrical, dichotomous, often furniſhed with ſmall bractes under the diviſions; pedicels very ſhort; calyx-leaves acute, two outward ones longer, more hirſute, and of a purpliſh colour; corolla campanulate, twice the length of the calyx, ſlightly five-lobed; ſtigma capitate, two-lobed. *Capſule* two-celled. *Seeds* two in each cell. A native of South America, cultivated in the botanic garden at Paris. Miller received ſeeds from Carthagena in New Spain, which he cultivated under the name of C. pentaphyllus, and which differs from the above in being perennial, and having only two purple flowers on each peduncle. 115. C. *quinquefolius*. Linn. 25? Mart. 40. Deſr. 102. Lam. 2102. Willd. 79. Swartz. 63. Pluk. Alm. 116. tab. 167. fig. 6. "Leaves digitate, ſmooth, toothed; peduncles even-ſurfaced." Linn. "Leaves digitate, ſmooth, toothed; ſtem hiſpid; peduncles many-flowered." Lam. *Stems* very long, ſlender, cylindrical, hiſpid, branched. *Leaves* alternate, petioled, ſmooth, bright green; ſegments lanceolate; middle one largeſt, near two inches long, about half an inch broad. *Flowers* white; peduncles longer than the leaves, ſlender, axillary, ſolitary, ſomewhat villous, dichotomous, from three to ſix-flowered, with ſmall awl-ſhaped bractes at the diviſions; calyx ſmooth, ſegments oblong, the three inner ones larger; corollas campanulate, five-toothed. *Capſule* four-celled. Deſr. Two celled, two-ſeeded. Swartz. A native of the Weſt Indies. The C. quinquefolius of Miller ſeems a different plant. It was raiſed by him from ſeeds ſent from New Spain, and is thus deſcribed. *Stems* thirty feet high or more, woody, with a purple bark. *Leaves* deeply divided into five ſharp-pointed lobes. *Flowers* large, purple; peduncles long, thick, with a bent joint in the middle. *Capſules* round, as large as a middling apple, three-celled. *Seeds* two in each cell. 116. C. *ciſſoides*. Lam. Ill. 2103. "Hirſute; leaves digitate, in fives, toothed; peduncles about three-flowered, ſhorter than the leaf; calyx hiſpid. A native of Cayenne. 117. C. *venoſus*. Mart. 108. Deſr. 104. Lam. 2105. Willd. 80. Vahl. 3. 32. "Smooth: leaves digitate, in fives; leaflets petioled, ovate-acuminate; common peticles with tendrils at the baſe." Lam. "Quite ſmooth; leaves digitate, in fives, quite entire; peduncles many-flowered." Vahl. *Stems* ſlender, cylindrical. *Leaves* petioled; leaflets acute at the baſe (rather than petioled), veined; middle one larger than the others, about two inches long; (common petioles with a ſhorter tendril at the baſe. Deſr. Peduncles with an ovate-heart-ſhaped, acuminate, ſolitary leaf at the baſe. Vahl. Is it not properly a ſtipula, which, as the peduncles are axillary, may be thought by one obſerver to accompany the petiole: by another, the peduncle?) *Flowers* in a corymb; peduncles ſolitary, dichotomous near the top, with ſmall awl ſhaped bractes; calyxes ſhort; ſegments egg-ſhaped, two larger; corollas funnel-ſhaped, tube nearly of the ſame diameter throughout, not gradually enlarged to the top; border but little widened; ſtigmas capitate, ſlightly two-lobed. Sent by Commerſon from the Iſles of France and Bourbon. On a ſtrict compariſon it appears certain, that Deſrouſſeaux and Vahl have deſcribed the ſame plant, and have given it the ſame name, without any knowledge of each others ſpecimens. 118. C. *glaber*. Deſr. 103. Lam. 2104. Willd. 81. Aubl. guian. 138. tab. 53. "Leaves digitate, in fives; leaflets ovate-lanceolate, quite entire, ſmooth; peduncles many-flowered." *Stems* numerous, long, cylindrical, flexible. *Leaves* alternate. *Flowers* white; peduncles axillary, ſolitary; pedicels long; calyx deeply divided; ſegments long, firm, ſmooth, acute; tube of the corolla rather long; border open, with five rounded lobes; ſtigmas two, long, acute. A native of Cayenne. The whole plant is milky. 119. C. *erioſpermus*. Deſr. 105. Lam. 2106. "Shrubby; leaves digitate; leaflets about eight, linear, very narrow; ſeeds very hirſute." Whole plant, except the ſeeds, ſmooth. *Stems* ſarmentous, woody, cylindrical. *Leaves* about an inch long, including the petioles. *Flowers* purple, axillary, in ſmall dichotomous racemes, ſhorter than the leaves; calyx-leaves obtuſe, not a quarter of the length of the flowers; corollas cylindrical. *Capſules* egg-ſhaped, even-ſurfaced, twice the length of the calyx, four-valved, two-celled. *Seeds* two in each cell; covered on their convex ſide with numerous, long, decumbent, whitiſh, ſilky hairs, directed towards the baſe. A native of St. Domingo. 120. C. *tenuifolius*. Willd. 109. Vahl. Symb. 3. 33. "Leaves digitate, in fives; leaflets linear; peduncles four or five-flowered." Whole plant ſmooth. *Stem* angular. *Leaves* petioled; leaflets very narrow, entire. *Peduncles* axillary, ſhort; upper ones ſometimes one-flowered. *Calyx* ſmooth, with oblong leaflets; ſtigma acute.

*** Stems not twining.*

121. C. *ſiculus*. Linn. Sp. Pl. 26. Mart. 44. Deſr. 4. Lam. 2003. Willd. 84. Flor. Græc. tab. 194. (C. ſiculus minor, flore parvo auriculato; Bocc. Sic. 89. tab. 48. Tourn. Inſt. 83.) "Leaves cordate-egg-ſhaped; bractes lanceolate; peduncles longer than the petiole." *Root* annual. *Stems* one or two feet high, cylindrical, nearly ſimple, ſometimes a little twining, but generally not at all. *Leaves* entire, acute. *Flowers* ſmall, blueiſh; peduncles axillary, curved downwards near the top. A native of Sicily. 122. C. *patens*. Deſr. 33. Lam. 2031. "Filiform, ſomewhat erect; leaves linear, mucronate; peduncles ſpreading horizontally, longer than the leaf." Whole plant ſlightly villous. *Stems* about a foot and half high, very ſlender, little or not at all twining, cylindrical, ſomewhat branched. *Leaves* abont an inch long, ſcarcely two lines broad, alternate, almoſt ſeſſile, ſometimes one or two-toothed. *Flowers* on long, axillary, ſimple peduncles, with two egg-ſhaped lanceolate bractes a little below the calyx; calyx-leaves egg-ſhaped, acute, half the length of the corolla. A native of Carolina. 123. C. *pentapetaloides*. Mart. 45. Willd. 85. Vahl. 2. 36. "Leaves lanceolate, obtuſe, naked, linear; branches declining; flowers ſolitary, five-cleft half way down." Reſembling C. tricolor, but ſmaller. *Leaves* ſomewhat petioled. *Root* annual. *Flowers* axillary, on ſhort peduncles: bractes generally two obſcure ſcales. *Flowers* blueiſh, with a yellow bottom; ſegments acute. A native of Majorca, and the iſlands of the Archipelago. 124. C. *ciliatus*. Roth. Catal. Bot. 2. 22. Ann. Bot. 2. 12. "Leaves oblong, wedge-ſhaped, emarginate, ciliated; ſtem proſtrate; capſules very hairy." 125. C. *evolvuloides*. Smith Prod. Flor. Græc. 134. Desfont. Atlant. 1. 176. tab. 49. Flor. Græc. tab. 198. "Leaves ſpatule-ſhaped, obtuſe, hairy; upper ones embracing the ſtem; ſtem declining; flowers ſolitary, ſeſſile." *Root* annual. A native of Cyprus. 126. C. *lineatus*. Linn. Sp. Pl. 29. Mart. 46. Deſr. 53. Lam. 2052. Willd. 86. Flor. Græc. tab. 199. (C. argenteus anguſtifolius, umbellatus, partim erectus partim ſupinus; Tourn. Cor. 1. C. oleæfolius β; Deſr. C. marina repens; Bar. Rar. 3. tab. 1132.) "Leaves lanceolate, ſilky, linear, petioled; peduncles two-flowered; calyxes ſilky, ſomewhat foliaceous." Linn. "Tomentous-ſilky; leaves oblong, obtuſe, attenuated at the baſe, linear; peduncles two-flowered, ſhorter than the leaf." Lam. *Root* perennial, creep-

ing. *Stems* ſeveral, riſing among a conſiderable number of root-leaves, from three to ſix inches high, weak, zig-zag, ſlightly angular, villous, a little branched. *Leaves* alternate, ſeſſile, but ſo much narrowed at their lower extremity as to appear petioled, a little channelled at the baſe to embrace the ſtem, nerved; lower ones longer than the others, nearer together, reaching almoſt to the top of the ſtem. *Flowers* reddiſh; peduncles axillary, on the upper part of the ſtem, ſolitary, dichotomous near the top, and furniſhed at the diviſion with two bractes, reſembling the leaves in ſhape and ſilkineſs, and extending a little beyond the calyx; beſides theſe there are ſometimes two other ſmall linear bractes, ſhorter than the calyx; calyxes ſmall; leaflets egg-ſhaped, acute, ſilky; corollas middle-ſized, half-open, villous on the outſide. A native of the ſouth of France, and the Levant. 127. C. *ſpicæfolius.* Deſr. 41. Lam. 2039. Barr. Ic. 311. (C. non convolvulus; Mant. 29. tab. 140.) "Leaves linear-lanceolate, narrowed at the baſe, nearly ſimple; peduncles one-flowered, ſhorter than the leaf." *Stems* decumbent at the baſe, then aſcending, a little zig-zag. *Leaves* alternate, about three lines long, reſembling thoſe of lavender; lower ones the ſame length as the others. *Flower* rather large; peduncles axillary, ſcarcely half the length of the leaves; bractes two, linear-lanceolate, ſituated near the calyx, and a little ſurpaſſing it; calyx about one-third of the length of the corolla, with five acute ſegments; ſtigmas long, filiform. A native of mountains in Spain. Willdenow thinks this and the preceding the ſame plant; and they are perhaps nothing more than varieties; but as La Marck and Deſrouſſeaux profeſs to have ſeen both of them growing in the botanic garden at Paris, in deference to their authority we have kept them diſtinct. 128. C. *ſaxatilis.* Mart. 110. Willd. 87. Vahl. Symb. 3. 33. Bar. Ic. 470. Bocc. Muſ. 2. 79. tab. 70. (C. lanuginoſus; Deſr. 47. Lam. 2046. C. argenteus umbellatus ſupinus; Tourn. Inſt. 84. Lychnis ſylveſtris campanulæ flore; Bauh. Pin. 206.) "Very hirſute; leaves linear; flowers in terminal heads; calyxes acuminate." *Root* perennial. *Stems* ſcarcely a foot long, cylindrical, a little branched. *Leaves* about an inch long, thinly ſet, alternate, ſeſſile, ſatiny on the young ſhoots. *Flowers* white, with a ſlight tint of purple, ſeſſile, eight or ten collected into a head at the extremity of the branches, which are commonly without leaves below to the extent of two inches, ſurrounded with a ſort of involucre conſiſting of five or ſix rather broad leaves; each flower ſurrounded with ſome ſmall linear bractes; calyxes divided to the baſe into minute ſegments, half the length of the corolla. 129. C. *Cneorum.* Linn. Sp. Pl. 30. Mart. 47. Willd. 83. Flor. Græc. tab. 200. Bot. Mag. 459. (C. argenteus; Deſr. 48. Lam. 2047. C. argenteus umbellatus erectus; Tourn. Inſt. 84. Moriſ. Hiſt. 2. 11. tab. 3. fig. 1. Cneorum album, folio argenteo molli; Bauh. Pin. 463. Dorycnium; Cluſ. Hiſ. 2. 254.) "Leaves lanceolate, tomentous; flowers umbelled; calyxes hirſute; ſtem ſomewhat erect." Linn. "Shrubby, ſilky; leaves oblong, obtuſe; flowers in terminal, capitate umbels; calyx ſhort, ſomewhat retuſe." Lam. *Root* perennial. *Stems* about three feet high, cylindrical, firm, upright. *Leaves* numerous, ſcattered, about an inch and half long, four or five lines broad, ſeſſile, narrowed at the baſe, ſoft, clothed with a fine decumbent, ſilky, brilliant down. *Flowers* white, tinged with a pale red, on ſhort peduncles; bractes reſembling the leaves, but ſmaller; calyxes about a third of the length of the corolla, ſhort, obtuſe, deeply divided, villous; corolla ſilky on the outſide; border rather open. A native of Candia and the iſlands of the Levant. 130. C. *oleæfolius.* Deſr. 49. Lam. 2048. "Shrubby, ſilky; leaves linear-lanceolate; flowers in terminal capitate umbels; calyxes lanceolate." A native of the Levant; nearly allied to the preceding, and ſcarcely more than a variety. 131. C. *linearis.* Willd. 89. Bot. Mag. 289. "Stems erect, ſhrubby; leaves linear, acute, clothed with ſilky hairs; flowers terminal, umbellate-panicled; calyxes hairy." Confounded by the Engliſh nurſerymen with the next ſpecies. Moſt allied to C. cneorum, but differs in having leaves much narrower, more pointed, and leſs ſilky. 132. C. *cantabricus.* Linn. Sp. Pl. 31. Mart. 48. Deſr. 46. Lam. 2045. Willd. 90. Jacq. Flor. Auſt. 3. tab. 296. (C. linariæ folio; Bauh. Pin. 295. C. linariæ folio aſſurgens; Tourn. Inſt. 53. & humilior, 54.) "Leaves linear, acute; ſtem branched, ſomewhat dichotomous; calyxes hairy." Linn. "Hairy; leaves linear-lanceolate, acute; ſtem branched, rather erect; flowers cluſtered." Lam. *β.* C. terreſtris; Linn. Sp. 27. Whole plant clothed with fine whitiſh hairs, ſoft to the touch. *Root* perennial. *Stems* about a foot high, cylindrical. *Leaves* two or three lines broad, alternate, ſeſſile. *Flowers* roſe-coloured or white, almoſt ſeſſile, growing two or three together at the end of the ſtem and branches; bractes linear, acute, reſembling the leaves but ſmaller; calyxes with five acute ſegments; corollas middle-ſized, open, almoſt flat; ſtigmas two, filiform. A native of the ſouth of Europe. 133. C. *ſuffruticoſus.* Smith Prod. Flor. Græc. p. 135. Desfont. Atl. tab. 48. "Leaves linear-lanceolate; ſtem aſcending, villous; peduncles axillary, one-flowered, three times the length of the leaf." *Root* perennial. A native of Barbary and Greece. 134. C. *Ammanii.* Deſr. 40. Lam. 2038. (C. ramoſus, erectus, argenteus minimus; Amm. Ruth. 5. n. 6.) "Silky; leaves linear; peduncles one flowered; bractes long; calyx acute." Whole plant armed with a ſhort ſilky ſilvery down. *Root* perennial. *Stems* from four to ſix inches high, ſlender, cylindrical, branched, rather erect. *Leaves* alternate, ſeſſile; root-ones not leſs than half an inch long, narrowed at the baſe, obtuſe; thoſe on the ſtem and branches longer, acute. *Flowers* campanulate, pale white, ſtarred with purple lines; peduncles filiform, axillary, ſolitary, nearly the length of the leaves, furniſhed a little above the middle with two bractes ſeven or eight lines long, diſtinguiſhed from the leaves only by being oppoſite; calyx ſhort, with egg-ſhaped acute ſegments. A native of Siberia. 135. C. *piloſellæfolius.* Deſr. 45. Lam. 2044. Willd. 92. (C. orientalis, humifuſus, piloſellæ foliis; Tourn. Cor. 1.) "Leaves lanceolate, ſeſſile, entire; peduncles elongated, many-flowered, looſely branched." *Root* perennial. *Stems* cylindrical, ſlender, ſlightly hairy, decumbent. *Leaves* alternate, three or four lines broad; beſet, eſpecially at the edges, with long ſeparate hairs. *Flowers* ſmall, campanulate; peduncles from four to ſix-flowered; bractes oppoſite, ſmall, lanceolate like the leaves, ſituated at the baſe of the pedicels; calyx-leaves egg-ſhaped, acute, villous, half the length of the corolla. A native of the Levant. 136. C. *dorycnium.* Linn. Sp. Pl. 28. Mart. 49. Deſr. 38. Lam. 2036. Willd. 93. Flor. Græc. tab. 201. (C. ramoſus incanus, foliis piloſellæ; Tourn. Inſt. 84.) "Leaves almoſt linear, ſilky; ſtem ſhrubby, panicled; calyxes almoſt naked, obtuſe." *Root* perennial. *Stems* a foot and half high, cylindrical, almoſt ſmooth, a little zig-zag, much branched, with few leaves, eſpecially towards the top. *Leaves* alternate, ſeſſile, narrow. *Flowers* generally ſolitary, ſeſſile in the forks of the branches or at their ſummit, commonly accompanied with one or two ſmall leaves; calyxes very ſmall; corollas campanulate, open, villous on the outſide, three or four times the length of the calyxes. A native of the Levant. 137. C. *proliferus.* Willd. 34. Vahl. Eclog. 1. 18. "Leaves linear, ſilky underneath; heads of flowers terminal, and in the diviſions of the branches; bractes egg-ſhaped, very hirſute on the outſide. A native of South America. 138. C. *lanatus*. Mart. 80. Willd. 95. Vahl. Symb. 1. 16. Flor. Græc. tab. 202. (C. orientalis humilis argenteus latifolius erectus & villoſus; Tourn. Cor. 1. C. cneorum; Forſk. Ægyp. 63. n. 124. C. ſericeus; Burm. Ind. 49. tab. 19. fig. 3?) "Leaves lanceolate-linear, tomentous; old branches ſpinous; flowers capitate, involucred." *Stem* ſhrubby, erect, branched at the bottom; old branches leafleſs, barren; flowering branches from the baſe of the old ones, quite ſimple, ſeven inches long or more, erect, cylindrical, ſpineleſs, rigid, zig-zag towards the end, and covered with a ſoft ſhaggineſs. *Leaves* alternate; lower ones lanceolate, attenuated at the baſe, ſometimes ſeveral from the ſame point at the foot of the branches, unequal; upper ones lanceolate-linear, ſeſſile, acute; floral ones a little broader than the reſt; all thickiſh, veinleſs, tomentous, but not ſilky. *Flowers* campanulate, hairy on the outſide, the colour of C. cneorum; peduncles from almoſt all the axils, ſolitary, half the length of the leaf, from ſix to eight-flowered; pedicels none; involucre ſix-leaved, the length of the calyx; three outer leaflets egg-ſhaped, acute; three inner ones lanceolate; all of them, as well as the peduncles and calyxes, extremely hirſute, with long, very ſoft, ſhining hairs on the outſide, only ſomewhat hairy within. *Bractes* two beneath each flower; calyx-ſegments linear; ſtyle bifid; ſtigmas acute. A native of the Lower Egypt and of Mount Sinai. 139. C. *Hyſtrix*. Mart. 81. Willd. 96. Vahl. Symb. 1. 16. (C. ſpinoſus; Forſk. Arab. 106. n. 121.) "Shrubby; leaves oblong; flowers ſeſſile, almoſt always ſolitary; branches ſpineſcent." *Stem* rigid, much branched, diffuſe, a foot high; branchlets ſomewhat ſilky. *Leaves* ſeſſile, ſcattered, ſilky, entire, ſmall. *Flowers* ſmall, axillary, hirſute; bractes two, at the baſe of the calyx, oblong, rather acute, a little broader at the end and reflexed; two outer calyx-leaves oblong, rigid, larger than the others; ſtigmas two, capillary. A native of Arabia. 140. C. *ſpinoſus*. Linn. jun. Supp. 137. Deſr. 36. Lam. 2035. Willd. 97. (C. fruticoſus; Pall. It. 2. 734. tab. m.) "Shrubby, erect; leaves lanceolate, ſilky; flowering branchlets ſpinous." *Root* perennial. *Stem* ſhort, much branched. *Leaves* alternate, ſeſſile. *Flowers* vertical, ſeſſile; calyx-leaves egg-ſhaped, acuminate, concave, tomentous; three outer ones larger; corollas plaited, five-toothed, tomentous on the outſide of the tube, with a reddiſh border. A native of Ruſſia. 141. C. *ſcoparius*. Linn. jun. Sup. 135. Mart. 50. Deſr. 51. Lam. 2050. Willd. 98. "Leaves linear, ſomewhat hairy; peduncles about three-flowered; calyxes ſilky, egg-ſhaped, acute; ſtem ſhrubby; branches rod-like." The habit of a broom. *Root* perennial. *Stems* cylindrical, quite ſmooth; branches erect, ſimple. *Leaves* alternate, diſtant, ſhort, thin, upright. *Flowers* white, villous on the outſide; peduncles alternate, ſolitary, bracteate. A native of Africa and the Canary Iſlands. This ſpecies and C. floridus produce the true roſe-wood of the ſhops. Ventenat ſuſpects that theſe two may form a ſeparate genus, having a one-celled capſule, which opens at the baſe and contains a ſingle ſeed. 142. C. *ſecundus*. Deſr. 41. Lam. 2051. "Tomentous-ferruginous; leaves ſeſſile, lanceolate; heads of flowers thick-ſet, unilateral, nearly ſeſſile." *Stems* the ſize of a gooſe-quill, cylindrical, ſomewhat zig-zag, but little branched. *Leaves* about an inch long, alternate, cottony on both ſides, unilateral on the branches. *Flowers* five or ſix in a denſe head, on very ſhort peduncles, without pedicels, intermingled with bractes which reſemble the young leaves; corollas a little villous on the outſide. A native of Syria, obſerved by La Billardiere. 143. C. *Oenotheroides*. Linn. jun. Supp. 137. Mart. 51. Deſr. 34. Lam. 2032. Willd. 99. "Shrubby, erect; leaves linear, ſomewhat hoary; peduncles axillary, ſolitary, erect, one-flowered, bracteate; calyxes lanceolate, ſmooth." *Stems* erect, cylindrical, reddiſh, and ſomewhat glaucous. *Leaves* about three inches long, narrow, lax, flat. *Flowers* tawny; peduncles ſhort, angular; bractes two, recurved, awl-ſhaped; calyx-leaves quite ſmooth, rather ſpreading, hoary, membranous at the edges; corolla large, funnel-ſhaped. A native of the Cape of Good Hope, obſerved by Sparrman. 144. C. *floridus*. Linn. jun. Sup. 136. Mart. 52. Deſr. 50. Lam. 2049. Willd. 100. Jacq. ic. 1. tab. 34. "Leaves oblong-lanceolate, attenuated at the baſe, ſomewhat hairy; flowering branches and peduncles panicled." *Root* perennial. *Stems* about four feet high, woody, procumbent, ſmooth; branches ſlender, erect, ſtiff, hoary. *Leaves* three or four inches long, ſcattered, entire, on ſhort petioles. *Flowers* pale red or white, numerous, rather ſmall; peduncles axillary from the upper leaves, repeatedly branched, ſo as to form a large thyrſoid panicle; calyx-leaves egg-ſhaped, concave, acute. *Capſules* one-celled, one-ſeeded, opening from the bottom in ten valves. A native of the Canary Iſlands. 145. C. *cuneatus*. Willd. 101. "Stem ſhrubby, erect; leaves wedge-ſhaped, obtuſe, mucronate, ſmooth: corymbs axillary, ſhorter than the leaves." *Root* perennial. *Stem* cylindrical, ſmooth. *Leaves* two inches long, quite entire, beſet underneath with a few cloſe-preſſed hairs; petioles ſhort, villous on the inſide. *Flowers* purple; calyx-leaves obtuſe, hairy; corolla an inch long, tube ſwelling. A native of the Eaſt Indies. 146. C. *corymboſus*. Linn. Sp. Pl. 33. Mart. 53. Deſr. 62. Lam. 2061. Willd. 102. (C. niveus, polyanthus; Plum. Cat. 1. MSS. 2. tab. 50. Burm. Amer. tab. 89. fig. 2.) "Leaves heart-ſhaped: peduncles umbellated; ſtem creeping." *Stems* numerous, woody, the thickneſs of a gooſe-quill, with long branches. *Leaves* two or three inches long, alternate, petioled, fine green. *Flowers* a beautiful white, with ſtill whiter rays; peduncles ſlender, nearly the length of the leaves, with one or two bractes, forming a corymb. *Capſules* membranous, top-ſhaped, one-celled. *Seeds* two or three. Deſrouſſeaux deſcribes the ſtems as twining, on the authority, as we ſuppoſe, of Plumier's MSS. A native of the Weſt Indies. 147. C. *ſpithamæus*. Linn. Sp. 32. Mart. 54. Willd. 103. Gron. Virg. 141. (C. foliis cordatis pubeſcentibus incanis; Walt. Car. 93.) "Leaves heart-ſhaped, pubeſcent; ſtem erect; peduncles one-flowered." *Flowers* large, white. A native of Virginia. 148. C. *perſicus*. Linn. Sp. Pl. 34. Mart. 55. Deſr. 39. Lam. 2037. Willd. 104. Gmel. It. 3. 36. tab. 97. "Leaves egg-ſhaped, tomentous; peduncles one-flowered." Whole plant tomentous like the common mullein. *Root* perennial. *Stems* the ſize of a gooſe-quill, cylindrical. *Leaves* quite entire, obtuſe, on very ſhort petioles. *Flowers* white; peduncles axillary, ſolitary, the length of the leaves, with two egg-ſhaped bractes near the top; calyx-leaves egg-ſhaped; the three inner ones ſmaller; corolla campanulate, four times the length of the calyx; germ woolly; ſtigmas two, linear, thickiſh. A native of Perſia on the ſhores of the Caſpian Sea. 149. C. *tricolor*. Linn. Sp. Pl. 35. Mart. 56. Deſr. 35. Lam. 2033. Willd. 105. Bot. Mag. 27. (C. peregrinus cæruleus, folio oblongo; Bauh. Pin. 295. C. luſitanicus, flore cæruleo; Tourn. 83.) "Leaves lanceolate, egg-ſhaped, ſeſſile; lower ones ſomewhat ſpatulate; peduncles one-flowered; ſtem declining." *Root* annual. *Stems* about a foot long, cylindrical, weak. *Leaves* ſometimes ſmooth, often hairy, eſpecially when young. *Flowers* yellowiſh at the bottom, white in the middle and fine ſky-blue on the upper part of the border; peduncles juſt above the leaves on the ſame ſide about two inches long. A native of Spain, Portugal, Sicily, and the coaſt of Barbary. It is generally called C. minus by the Engliſh gardeners. 150. C. *acetoſellæfolius*. Willd. 106. Vahl. eclog. 1. 18. Plum. Amer. 9. tab. 105. "Leaves oblong-lanceolate, ſomewhat haſtate; peduncles elongated, one-flowered; ſtem creeping." *Root* perennial. A native of South America. 151. C. *repens*. Linn. Sp. Pl. 36. Mart. 57. Deſr. 30. Lam. 2029. Willd. 107. (Ipomæa aquatica; Forſk. Arab. 44. Ballel; Rheed. Mal. 11. 107. tab. 52.) "Leaves arrow-ſhaped, obtuſe behind; peduncles one or two-flowered." *Root* perennial. *Stem* creeping, jointed, rooting, angular, compreſſed, ſubdivided. *Leaves* crowded, terminal, emarginate, ſmooth, ſomewhat ſucculent, on longiſh petioles. *Flowers* whitiſh, rather large; peduncles from the axils of the terminal petioles, erect. A native of the Eaſt and Weſt Indies. 152. C. *reptans*. Linn. Sp. Pl. 37. Mart. 58. Deſr. 31. Willd. 108. (Olus vagum; Rumph. amb. 5. 419. tab. 155, fig. 1.) "Leaves haſtate-lanceolate; auricles rounded; ſtem creeping; peduncles one or two-flowered." *Root* perennial. *Stem* filiform, ſmooth and even. *Leaves* ſmooth, acuminate. *Flowers* pale purple; peduncles ſhorter than the petioles; calyx rounded. *Capſule* ſmooth, two-celled, with two ſeeds in each cell. A native of the Eaſt Indies, China, and Cochinchina, where it is uſed as a potherb. 153. C. *edulis*. Mart. 59. Deſr. 54. Lam. 2053. Willd. 109. Thunb. jap. 84. "Leaves heart-ſhaped, entire and three-lobed, ſmooth; ſtem creeping, angular." *Root* perennial, often as big as the human fiſt, tubercled, fleſhy like C. batatas, eſculent, ſoft, and ſapid. Said to be brought to Japan by the Portugueſe. 154. C. *hirtus*. Linn. Sp. Pl. 38. Mart. 60. Deſr. 83. Lam. 2081. "Leaves heart-ſhaped, ſomewhat haſtate, villous; ſtem and petioles hairy; peduncles many-flowered." *Root* annual; *Stem* a little twining. *Leaves* but little hairy. *Flowers* alternate, pedicelled, ſmooth, on peduncles longer than the leaves; involucres to each pedicel, very ſmall, lanceolate. A native of the Eaſt Indies. 155. C. *Soldanella*. Linn. Sp. Pl. 39. Mart. 61. Eng. Bot. 314. (C. maritimus noſtras rotundifolius; Tourn. 83. Soldanella maritima minor; Bauh. Pin. 295.) "Leaves kidney-ſhaped; peduncles one-flowered, with winged angles." Dr. Smith. *Root* perennial, long, creeping. *Stems* five or ſix inches long, procumbent, few-flowered. *Leaves* alternate, petioled, entire or a little angular, ſmooth and even, ſomewhat fleſhy. *Flowers* fleſh-coloured, yellowiſh at the plaits; peduncles axillary, ſolitary, rather erect, thickened near the top, quadrangular; bractes large, egg-ſhaped, cloſe to the flower; calyx-leaves large, egg-ſhaped. *Capſule* three-celled. *Seeds* black, one in each cell. A native of the ſea coaſts of Great Britain, and other parts of Europe. It abounds in a milky juice, which has a bitter, acrid, ſaline taſte, and is eſteemed a good purgative. 156. C. *Imperati*. Mart. 83. Willd. 112. Vahl Symb. 1. 17. (C. Stoloniferus; Deſr. 43. Lam. 2041. Cyril. Pl. rar. faſc. 1. 14. tab. 5. Soldanella vel braſſica maritima major; Bauh. Pin. 295. C. maritimus major italicus; Tourn. Inſt. 83.) "Leaves panduriform, or entire, emarginate, heart-ſhaped; peduncles one-flowered; corolla bell-ſhaped; ſtem creeping." Vahl. "Procumbent; leaves egg-ſhaped, retuſe, emarginate; lower ones undivided; upper ones ſinuate-lobed at the ſide." Lam. Nearly allied to the preceding. *Root* perennial. *Stem* cylindrical, quite ſmooth, a little branched, extending far on the ſand, rooting at the knots. *Leaves* alternate, ſmooth, ſhining, on long petioles. *Flowers* yellowiſh white; peduncles axillary, ſolitary, or in pairs, nearly the length of the petioles, with two ſmall bractes; calyx-leaves egg-ſhaped, obtuſe; ſtigma capitate. A native of the ſea-ſhore in Italy. 157. C. *arenarius*. Mart. 83. Lam. 2042. Willd. 63. Vahl. Symb. 1. 18. "Leaves oblong, emarginate, lobed at the baſe, or entire; peduncles one-flowered; corollas tubular." Whole plant ſmooth. *Stems* decumbent, filiform, zig-zag, purpliſh. *Leaves* cluſtered, veinleſs; petiole longer than the leaf. *Peduncles* in pairs or ſolitary, axillary, the length of the petioles; calyx-leaves equal, oblong, ſomewhat membranous; tube of the corolla enlarged gradually towards the top. A native of the Azores. 158. C. *maritimus*. Deſr. 44. Lam. 2043. Pluk. phyt. tab. 24. fig. 5. "Leaves emarginate, two-lobed, wedge-ſhaped at the baſe; peduncles many-flowered; ſtem decumbent, throwing out roots." Whole plant ſmooth. *Stems* cylindrical. *Leaves* alternate, mucronate by the elongation of the principal nerve, entire, thick, fleſhy; petioles channelled. *Flowers* purple, large, bell-ſhaped; peduncles from three to ſix-flowered, generally longer than the petioles, cylindrical, divided above the middle, and furniſhed at the diviſions with ſmall awl-ſhaped bractes; calyx-leaves egg-ſhaped, ſlightly mucronate. *Capſules* roundiſh. *Seeds* four A native of the Iſle of France, and of the Eaſt Indies. 159. C. *Pes capræ*. Linn. Sp. Pl. 40. Mart. 62. Willd. 113. (C. maritimus β.; Deſr. Lam. Ipomæa biloba; Forſk. C. maritimus zeylanicus; Herm. lugdb. 174. tab. 175. C. marinus; Rumph. Amb. 5. 433. tab. 159. C. maritimus ſive Soldanella è Maderaſpatan; Pluk. phyt. tab. 24. fig. 4. Schovanna-adambœ; Rheed. Mal. 11. 17. tab. 57.) "Leaves deeply emarginate, creſcent-ſhaped, truncate at the baſe; peduncles often one-flowered." *Root* annual. *Stem* ſomewhat ſhrubby, procumbent, creeping, a little villous, red. *Leaves* thick, tomentous. *Flowers* purpliſh. A native of the Eaſt Indies, China, Cochinchina, and the eaſtern coaſt of Africa. 160. C. *braſilienſis*. Linn. Sp. Pl. 41. Mart. 63. Willd. 114. (C. maritimus γ. Deſr. Lam. C. maritimus; Brown. Jam. C. marinus; Plum. Amer. 89. tab. 104. Marcgr. bras. 51. Piſ. braſ. 258.) "Leaves ſlightly emarginate, roundiſh, egg-ſhaped, often three-flowered." *Stems* perennial, and trailing to a great diſtance. *Leaves* larger than thoſe of the laſt two ſpecies; petioles marked near the leaf with two red ſpots. *Flowers* large, purple; peduncles long. *Capſules* large, three-celled. *Seeds* one in each cell. Whole plant milky and a ſtrong purgative. A native of the coaſt of Brazil, and of the Straits of Magellan. 161. C. *multifidus*. Willd. 115. Thunb. prod. 35. "Leaves palmate; lobes ſeven, linear, entire; peduncles one-flowered; ſtem decumbent." A native of the Cape of Good Hope. 162. C. *ſublobatus*. Linn. jun. Sup. 135. Deſr. 55. Lam. 2054. Willd. 116. "Stem procumbent; upper leaves repand-toothed at the tip; flowers capitate." *Root* annual. *Leaves* a little villous; lower ones heart-ſhaped; upper ones repand and almoſt lobed. *Flowers* aggregate, three together, ſeſſile, parallel, with a ſix-leaved involucrum. *Flowers* large. A native of the Eaſt Indies. 163. C. *capenſis*. Willd. 117. Thunb. prod. 35. "Leaves haſtate; lobes ſemibifid; peduncles about two-flowered; ſtem decumbent, villous." A native of the Cape of Good Hope. 164. C. *ſagittatus*. Willd. 118. Thunb. prod. 35. "Leaves haſtate and arrow-ſhaped; peduncles one-flowered; ſtems proſtrate." A native of the Cape of Good-Hope. 165. C. *littoralis*. Linn. Sp. Pl. 42. Mart. 65. Deſr. 28. Lam. 2027. Willd. 119. (C. albus, folio laciniato, maritimus, Plum. Cat. 1. Burm. Amer. 79. tab. 90. fig. 2. Tourn. 84.) "Leaves oblong, lobate-palmate; peduncles one-flowered; ſtem creeping." *Stems* very long, much branched, nearly the thickneſs of a gooſe-quill, white, tender, creeping and taking root. *Leaves* a little larger than the palm of the hand, palmate in the likeneſs of a duck's foot, fleſhy, tender, bright green, nerved, on longiſh petioles. *Flowers* large, white; peduncles axillary, ſolitary, rarely two-flowered, ſhorter than the leaves; corolla campanulate; border ſpreading, ſlightly cut. *Capſule* villous, ſilky white. A native of the Weſt Indies. 166. C. *martinicenſis.* Mart 42. Deſr. 29. Lam. 2028 Jacq. Amer. 26. tab. 17. pict. 19. tab. 24. "Leaves elliptical, ſmooth; peduncles one-flowered, longer than the leaf; ſtem creeping." *Stems* cylindrical, ſmooth *Leaves* alternate, obtuſe, mucronate by the projection of the middle nerve, entire, petioled. *Flowers* white; peduncles axillary, ſolitary, with two ſmall bractes near the top; three outer calyx-leaves large, egg-ſhaped, acute, lax; two inner ones ſmaller, lanceolate, acuminate. A native of Martinico.

Convolvulus *americanus ſubrotundis foliis*; Pluk. See Ipomæa *bona nox.*

Convolvulus *americanus madjuccæ folio*; Pluk. See Ipomæa *tuberoſa.*

Convolvulus *braſilianus*; Rai. See Cissampelus *Pareira.*

Convolvulus *coccineus*; Plum. See Ipomæa *coccinea.*

Convolvulus *filiformis*; Deſr. Lam. See Ipomæa *filiformis.*

Convolvulus *fœtidus*; Rumph. See Pæderia *fœtida.*

Convolvulus *foliis cordatis*; Linn. Hort. Cliff. See Ipomæa *bona nox.*

Convolvulus *herbaceus erectus foliis linearibus*; Brown. See Evolvulus *linifolius.*

Convolvulus *herbaceus erectus foliis linearibus ſubhirſutus*; Brown. See Evolvulus *ſericeus.*

Convolvulus *indicus villoſus*; Herm. See Ipomæa *hepatici folio.*

Convolvulus *linifolius*; Kniph. See Evolvulus *linifolius.*

Convolvulus *major heptaphyllus*; Sloan. See Ipomæa *tuberoſa.*

Convolvulus *minor pentaphyllus*; Cateſb. See Ipomæa *Carolinus.*

Convolvulus *minor repens nummulariæ folio*; Sloan. See Evolvulus *nummularius.*

Convolvulus *minor ſemine triangulo*; C. Bauh. See Polygonum *Convolvulus.*

Convolvulus *nigrum*; Dod. See Polygonum *Convolvulus.*

Convolvulus *pinnatus*; Deſr. See Ipomæa *pinnata.*

Convolvulus *repandus*; Deſr. Lam. See Ipomæa *repanda.*

Convolvulus *ſtellatus*; Dill. See Ipomæa *lacunoſa.*

Convolvulus *zeylanicus*, *Pes trigrinus*; Herm. See Ipomæa *Pes tigridis*

Obſ. It is not eaſy, perhaps not poſſible, to draw a deciſive line of ſeparation between convolvulus and ipomæa. Tournefort attributed a bell ſhaped corolla to the former; and a funnel-ſhaped one to the latter, under the name of Quamoclit taken up from Cluſius, and of which he knew only one ſpecies; but theſe characters were ſoon abandoned. Linnæus, Schreber, Willdenow, and La Marck, have aſſigned a two-celled capſule and a bifid ſtigma to convolvulus, and a three-celled capſule to ipomæa, but this diſtinction has alſo been found inconvenient in practice. Gærtner places under convolvulus all the ſpecies which have a proper capſule, whatever be the number of its cells; and confines the genus ipomæa to ſuch as have a valveleſs berry, with four, or by abortion, two ſingle-ſeeded cells; a diſtinction which excludes all the ſpecies of the latter, except bona nox and zeylanica. Unable to come to a ſatisfactory determination amidſt this diſcordance of opinion, and unwilling to increaſe a genus already embarraſſingly large, we have made no alteration in the general diſtribution adopted by Linnæus and his followers: and have attempted to conſtruct the genuine and eſſential characters of convolvulus ſo as to include all the preſent received ſpecies.

Convolvulus, in *Rural Economy.* See Bind-weed and Weed.

CONVOLUTION, a winding or turning motion, proper to the trunks of ſome plants; as the *convolvuli,* or bind-weeds, and the claſpers of vines, and briony.

Dr. Grew thinks, that all thoſe plants whoſe roots are twiſted, have ſuch a *convolution:* and he aſſigns two great efficient cauſes of this winding motion, the ſun and the moon. It is very eaſy to try whether there be any ſuch convolution or not in the trunks of plants; which may be done, as he hints, by tying a little bit of paper to any of the branches which are exactly north, ſouth, &c. and then ſeeing whether it will change its poſition or not, in reſpect of the point of the compaſs.

CONVOY, from the French *convoyer, to conduct, eſcort;* in *Maritime Language,* ſignifies one or more veſſels of war, entruſted with the conduct of a fleet of merchants; ſerving as a watch, and a ſhelter from the inſults of the enemies of the ſtate to which they belong, or of pirates.

Convoy, in *Mechanics,* denotes a brake, gripe, or regulator for moderating the velocity of tram or rail-way waggons on ſteep parts of their deſcents: in ſome inſtances waggons heavily laden with coals, lime-ſtone, &c. deſcend for conſiderable diſtances on ſteep rail-ways, without horſes, and regulated only by a man who rides behind them aſtride upon the convoy; as from Whibſey-ſlack to the Bradford-canal in the Weſt-riding of Yorkſhire, and other places. Horſes are uſed to drag the empty waggons up the hill again. See our articles Canal and Rail-way.

On ſome rail-ways, where the trade is a deſcending one, and the declivity in ſome places 12 to 16 inches in a chain, the horſes, in holding back to moderate the velocity of the trams, are very liable to be thrown down and much injured, and even killed by the momentum of the trams; for obviating this evil, Mr. Charles Le Caan contrived a convoy, check, or ſtop, a model and deſcription of which he preſented to the Society of Arts in 1805, (ſee Tranſactions, Soc. Arts, xxiii. 316.) in which the convoy, in form of circular wedges, to act before the front wheels of the trams, is ſuſpended by chains from the ſhafts by which the horſe draws the tram, ſo as to cauſe no impediment to the motion of the wheels, as long as the horſe is on his legs, and the ſhafts nearly in an horizontal poſition; but in caſe of the horſe falling, and the ſhafts by that means declining downwards, the convoy inſtantly drops and ſtops the further progreſs of the wheels on the tram-plates; other kinds of convoys and ſlippers are deſcribed in our article Canal.

In 1805, Mr. F. D. Walker applied a ſimilar principle to that of Mr. Le Caan's convoy, to the ſhafts of a four-wheeled carriage called a ſociable; which convoy, on being let down by means of a pedal acted on by the coachman's foot, checked the motion of the four wheels in deſcending ſteep hills, and greatly ſecured the carriage and paſſengers from injury by runaway horſes: for two years this contrivance has been uſed with perfect ſucceſs by Mr. Walker, in frequently deſcending very ſteep hills, without locking the wheels.

Convoy, in *Military Language,* denotes ſome ſuccour or ſupply of men, money, ammunition, proviſions, ſtores, &c. conveyed in time of war by land or water, to a town or an army. A body of men, that marches to protect any thing, and prevent it from falling into the hands of an enemy, is alſo called a *convoy*. An officer, who has the command of a convoy, ſhould take all poſſible precautions for its ſecurity, and ſhould endeavour, before it marches, or ſets out, to procure good intelligence concerning the enemy's out-parties. And as the commanding officer of the place, from which the convoy is to ſet out, and thoſe of ſuch other places, by which it is to paſs, are the moſt proper perſons for him to apply to for aſſiſtance, he ſhould take ſuch meaſures as will enable him to keep up a conſtant intercourſe with them. The conducting of a convoy is one of the moſt important and moſt difficult of all military operations. The ſtrength of the detachment employed to eſcort a convoy ſhould have a reference to the importance of the convoy itſelf. For there are caſes when the eſcort ſhould be commanded by an able and experienced general.

When it may be neceſſary to paſs the night in the open fields, the cuſtom is to empark, that is, to form a cloſe with the waggons, for the troops to ſleep in, and this is a good precaution againſt any unexpected attempt of the enemy to ſurpriſe them. But if they ſhould find themſelves on the point of being attacked during the march, urgent neceſſity alone ſhould conſtrain them to adopt this method; and eſpecially the conſideration of their being very inferior to the enemy, ſince they would thus tie up their own hands and render it impoſſible for themſelves not to ſurrender, in caſe it ſhould happen that they were not ſeaſonably relieved. When the convoy is conſiderable; when it is to paſs between places in the hands of the enemy; and when it runs any riſk of being attacked; it ought to have a large eſcort, which is to be diſpoſed in ſuch a manner as to cover the convoy, inſtead of being covered by it. And as ſoon as the commanding officer hears of the enemy's being at hand, he is to leave a few detachments to accompany the waggons, and ſave them from ſuch of the enemy's parties as might attempt to turn them into a wrong road, or break their chain; and aſſembling the reſt of his troops, infantry as well as cavalry, ſeize the moſt favourable poſt within his power, to ſtop the enemy, or fight him, if he cannot avoid it. In the mean time, the convoy is to make the beſt of its way, and to get as far from the danger as poſſible. Should the troops, at any time, think it proper to cover themſelves with the waggons of a convoy, they ſhould be made to march in two columns, at a ſmall diſtance aſunder; and if the files ſhould prove too long in two columns, they muſt be formed into three or four. In this diſpoſition, which, however, the ground will not always allow of, as ſoon as the enemy is obſerved to be preparing for a ſerious attack, the horſes are to be immediately unharneſſed, and removed, not only that the waggons may be brought more cloſely together, ſo as to form a rampart, but to ſave the horſes, of which, otherwiſe, ſo many might be loſt, as to render it neceſſary, even after repulſing the enemy, to abandon part of the convoy. This muſt alſo be the caſe, if the troops ſhould be ſtopped, and obliged to fight in their march, as it would be impoſſible that ſeveral horſes ſhould not be maimed or killed. It appears, therefore, that, in order to ſave a convoy, the troops ſhould not think of covering themſelves with it. If at any time a retreat ſhould be neceſſary with a great number of baggage waggons, the retreating troops ſhould not think ſo much of the protection they might afford, as the embarraſſments they muſt create. The 10,000 Greeks rid themſelves of theirs; and, confining themſelves to ſome beaſts of burden, took the reſolution of fighting, uncovered. Moreover, regard ſhould be had to the country which the troops are to traverſe, and the kind of enemy with which they have to contend. If the country is an extenſive plain, and the enemy very ſtrong in cavalry, like the Turks, the waggons may prove of great ſervice; beſides thoſe for the baggage, which in caſes of neceſſity may be uſed for that purpoſe, the army ſhould provide itſelf with ſome of thoſe belonging to the inhabitants, to carry the chevaux-de-friſe, and the ſick and wounded.

Convoy, *Order of*, in *Naval Tactics*, denotes that which a fleet holds in making a ſtraight courſe; the ſhips being all in the wake of one another, ſteering on the ſame [illegible] of the compaſs, and forming a right line. This order, according to M. Bourdé de Villehuet, is the moſt ſimple, and the only one a fleet ought to be in at all times, for the following reaſons:—it is eaſily preſerved; it cannot be diſcompoſed in 20 out of the 32 ſhifts of wind, and is eaſily reformed in the 12 other changes; and it is eaſy to paſs from that order to thoſe that are proper for the ſecurity of a fleet, in all poſſible caſes, either to preſerve one's ſelf, to attack, or to defend. If the fleet be numerous, the ſhips are to be arranged parallel to one another, that of the admiral occupying the middle, and ſteering all three the ſame courſe.

To form the order of convoy in one line. When the fleet is in no particular order of ſailing, the leading ſhip is to veer ſufficiently for the others to get in her wake, and ſteer the ſame courſe ſhe holds. The commanding officer generally takes this poſt, when the ſquadron is not numerous. That the order may be the ſooner formed, every ſhip of the fleet or ſquadron ſhould chaſe at the ſame time that which is to be a-head of her in the line, taking care to manœuvre in ſuch a manner as to avoid running foul of thoſe which croſs her fore-foot in endeavouring to join their leaders in the line. Therefore, ſuch ſhips as are to leeward of others ſhould take care not to perſiſt obſtinately in weathering them; but they muſt back, or go a-ſtern if neceſſary, by keeping away a little more. Such as ſhould already be in the column, and are to be more a-ſtern, muſt bring to till they are in their poſts, or ſtand on under a very eaſy ſail, that each ſhip may contribute to the celerity of forming the order.

To form the order of convoy in three columns. The leaders of each of the three diviſions are to place themſelves in a line right a-breaſt of one another; and at a proper diſtance between themſelves, according to the length of the columns, which will accelerate the diſpoſition. Then every ſhip of each particular ſquadron, chaſing that which is to be next a-head of her, will come and take their ſtation a-ſtern of one another at the rear of the leading ſhip of the diviſion, and ſteer directly after her. This order, which in practice is eaſily maintained, has the advantage of keeping the fleet cloſe and connected, without cauſing any delay in its progreſs. The beſt ſailors can regulate their velocity by that of thoſe which are inferior to them in ſailing; and theſe, on the other hand, may, with a little attention, carry as much ſail as the weather will admit, by which means all imaginable courſes may, without breaking, be ſteered.

To change from the order of convoy, in one line, to the order of battle, continuing on the ſame tack. The headmoſt ſhip is to haul cloſe by the wind on the ſame tack, and the reſt of the fleet are to make the ſame movement in ſucceſſion, ſteering the proper diſtances from each other.

To change from the order of convoy, in one line, to that of battle on the other tack. The headmoſt ſhip is to veer and to come to the wind on the other tack; then all the veſſels of the fleet are to perform the ſame manœuvre in ſucceſſion. Otherwiſe, after having formed the order of battle on the ſame tack, as before, the van-ſhip is to tack; and all the ſhips of the fleet are to follow in ſucceſſion, to form the order of battle on the other tack. Or, if you are ſteering a courſe in the order of convoy, 4 points large, the order of battle on the other tack may be formed at once, by all the ſhips veering or ſtaying together.

To change from the order of convoy, in three columns, to the order of battle on the ſame tack. If the fleet has the wind on the beam, or between cloſe-hauled and eight points large, (See *Plate* I. *Naval Tactics*, *fig.* 1) the ſhips of the lee-column are all to bring to at the ſame time. The other two columns ſtand on. When the leader of the weather-column brings the lee leader to bear on the cloſe-hauled line, he tacks, and is followed in ſucceſſion. The centre-column does the ſame. But as the weather-column has a greater diſtance to run, it muſt make all poſſible ſail, while the centre-column need not make ſo much; becauſe the centre-column is not to begin to haul its wind till the centre-ſhip of the weather-column has got on the cloſe-hauled line. The lee-column is to follow in the ſame manner, when the centre-ſhip of the centre-column is cloſe by the wind.

If the wind be more than eight points, or right aft, (*fig.* 2.); the column which is to form the van-guard in the order of battle is inſtantly to haul its wind in ſucceſſion, with all ſails ſet; while the two others, continuing their courſe, will put themſelves ſucceſſively by the wind, on the cloſe-hauled line upon which the order of battle is to be formed, and conſequently in the wake of the weather-column.

If the columns be cloſe on a wind, it then becomes a caſe within the uſual fifth order of ſailing. See *Order of* SAILING.

To change from the order of convoy, in three columns, to the order of battle on the other tack. The fleet may be put firſt in order of battle, on the ſame tack; then, making the ſhips tack in ſucceſſion, they will be in order of battle on the other tack. But the time of evolution may be diminiſhed, (*fig.* 3.) by making the two weather-columns bring to, when ſailing between cloſe-hauled and eight points large, while the ſhips of the lee-column veer in ſucceſſion, and keep their wind on the other tack. The centre-ſhip of the lee-column having veered, the centre-column is to fill, the leader of which bears away, running exactly with the wind right-aft, and is followed in ſucceſſion by the ſhips of his diviſion, till they are in the wake of the lee-column, then on the other tack; when the leader of the centre-column hauls by the wind, the ſhips of his diviſion hauling in ſucceſſion. When the centre-ſhip of the centre-column has bore away, the weather ſquadron manœuvres in the ſame manner, and thereby completes the order of battle.

To change from the order of convoy to that of retreat. Whether the fleet be the order of convoy in one line or in three columns, they are firſt to form in the order of battle on the ſame tack; and thence they are to paſs to the order of retreat. See *Order of* SAILING.

To change from the order of battle to the order of convoy, in one line, on the ſame tack. The van-ſhip is to bear away as far as the intended courſe, and the reſt are to execute the ſame manœuvre in ſucceſſion; ſo that when the rear-ſhip ſhall have made the ſame movement, the evolution will be completed, and the order of convoy formed on the ſame tack.

To change from the order of battle to the order of convoy, in one line, on the other tack. The van-ſhip is to tack and run one point large, till ſhe can bear away, under the ſtern of the rear-ſhip, as far as the courſe which the fleet is to hold. All the ſhips are to perform the ſame manœuvre at the ſame points, to change the order and get upon the other tack. The van-ſhip, inſtead of tacking, may veer and run a little time before the wind, before getting on the other tack; then ſhe will heave to the wind on the fleet's courſe, without fear of breaking through the rear. This movement is ſhorter and preferable: ſince the order of convoy is never held to keep by the wind.

To change from the order of battle to the order of convoy, in three columns, on the ſame tack. The three leaders of the columns are to bear away together, and ſteer on the intended courſe; then the ſhips of each ſquadron are to execute the ſame manœuvre in ſucceſſion, following the ſame direction; ſo that the three rear-ſhips, veering at the ſame time in the wake of their reſpective columns, will compleat the evolution. The columns will find themſelves too diſtant from each other; but, as there is nothing which diſturbs them, and they have the wind right-aft or very large, it will be eaſy for them to cloſe as much as may be neceſſary.

To change from the line of battle to the order of convoy, in three columns, on the other tack. The three leading ſhips of the columns are to heave in ſtays at the ſame time, and bear away on the perpendicular of the wind on the other tack; then the ſhips of each ſquadron are to perform the ſame manœuvre in ſucceſſion; and when the rear-ſhips ſhall have turned about and be in a line with their reſpective columns, and the leaders of the weather-diviſions ſhall, by crowding all the ſails, have come a-breaſt of the van-ſhip of the lee ſquadron, the evolution will be compleated. If the fleet is to ſteer more large than the perpendicular to the wind, it will be eaſily formed, by making the leaders and their columns bear away in ſucceſſion, then putting afterwards the columns at the neceſſary diſtance from each other.

To change from the order of retreat to the order of convoy, in one line. One of the wings is to haul together cloſe by the wind, on the ſame tack as the line of bearing on which they are formed, in order to bear away in ſucceſſion at the point of the angle, in the wake of the other wing; the ſhips of which are to run with the wind four points large, on their line of bearing; and, when the laſt ſhip of the weather-wing is in the wake of her line, the order of convoy is formed. If it be neceſſary to ſail more large, or if you would not keep away ſo much, the ſame ſhips may keep their wind more, and follow the van-ſhip in ſucceſſion.

To change from the order of retreat to the order of convoy, in three columns. Firſt form the order of battle, and paſs from that to the order of convoy, in three columns.

To reſtore the order of convoy in one line, when the wind comes a-head more than cloſe-hauled. The order of convoy, it is plain, cannot be diſturbed by all the ſhifts of wind as long as it is more abaft than the ſtarboard and larboard lines of bearing; becauſe the ſhips, ſteering large in the wake of each other, can eaſily maintain their poſts, having only their ſails to trim, whether the fleet be in one line or in ſeveral columns. But if the wind draws more a-head than one of the lines above-mentioned, it is evident that the ſhips being obliged to veer, or pay off, all at the ſame time, on the ſame tack, the order will be diſturbed. In order to reſtore it on the ſame tack, when the fleet is in one line in the order of convoy; if we ſuppoſe the fleet ſteering large on the ſtarboard tack, and the wind comes ſuddenly right a-head, which would throw all the ſails flat a-back on their maſts, the van-ſhip is to caſt inſtantly to port, and bring to on the ſtarboard tack, while all the other ſhips of the fleet are to box off, together and at the ſame time, to ſtarboard, and make all ſail, in order to come with celerity cloſe by the wind on the larboard tack, and get into the wake of the van-ſhip, then to tack and take their ſtations ſucceſſively, under an eaſy ſail, and bringing to likewiſe till the rear-ſhip, which has a good way to run, be in her poſt. If you ſhould wiſh to get on the other tack, then the van-ſhip is to caſt to ſtarboard, to bring to on the larboard tack by the wind; then the reſt of the fleet would caſt the other way, to tack afterwards ſucceſſively in the wake of the ſhip which lies to, and take their ſtation there, as has been ſaid before, with this difference, that, after the reſtoring of the order, you would find yourſelf on the larboard tack. If the ſudden ſhift of wind be not quite a-head, or if it be ſix points, or between ſix and twelve, the van-ſhip is, nevertheleſs, to bring to on one tack, while the reſt of the fleet, caſting on the ſtarboard, make all ſail to gain her wake, to tack there, and thus regain their ſtations. The order of convoy may be reſtored by a ſhorter and more ſimple method, which, however, will cauſe the fleet to drop to leeward more than the former does. In the ſame caſe as the laſt, when the wind comes right a-head, the whole fleet is to pay off on the ſame tack, if the ſhips are all on one line, and the rear-ſhip muſt bring to, while the reſt of the ſhips running five points large (if the wind has ſhifted ſix points beyond the direction of cloſe-hauled), will come and bring to ſucceſſively a-head of the van-ſhip, on that line of bearing which they are to hold, obſerving that ſuch ſhips are to carry a greater and proportionable preſs of ſail, as, being nearer the van-ſhip, they have conſequently more way to run before they can regain their poſts. To know how many points or degrees the weather-ſhips have to run large to get into their ſtations, add eight points or 90 degrees to the half of the points or degrees the wind has ſhifted beyond one of the two lines of bearing; and, in regaining your poſts, you will have the number of points by which you differ from the firſt courſe you ſteered.

To reſtore the order of convoy, in three columns, when diſturbed by a ſudden ſhift of wind right a-head. In this caſe, the whole fleet muſt caſt the ſame way all together, leaving the three van-ſhips of the columns lying to, cloſe to the wind on the tack on which you purpoſe to continue cloſe-hauled, while the ſhips of the three columns running large all together on a courſe (to leeward of the firſt), which muſt always be determined by half the number of points or degrees the wind has ſhifted beyond the direction of cloſe-hauled, added to eight points or 90 degrees, will bear away with care for their ſtations in the cloſe-hauled line of bearing, which they are to hold to the windward ſide of their rear-ſhip, where they will arrive ſucceſſively, by carrying more ſail according as they may be nearer to the van, becauſe in that caſe they have a greater diſtance to run.

We ſhall cloſe this article with ſome remarks on *the convoy of merchant ſhips, under the protection of men of war.* For the due care of a large fleet, the convoy ſhould have a number of frigates, diſtributed a-head, a-ſtern, and on the wings of the fleet, which is always to be kept in the order of convoy, on three, four, five, or ſix columns, according to the number of which it is compoſed; ſome other frigates are alſo to be ſent on the look-out, to deſcry what paſſes at a diſtance, and to give timely warning of the approach of the enemy. If theſe ſhould diſcover an enemy of ſuperior force, they ſhould make it anſwer by ſignal; and it may be adviſable that they ſhould ſteer a different courſe from that of the fleet, in order to deceive the hoſtile ſhips in ſight. The men of war are to hold themſelves in the order of convoy a little a-head, and to windward of the weather-column of the fleet; becauſe they will then be able readily to attend wherever their preſence may be neceſſary; the frigates will, with alacrity and exactneſs, repeat their ſignals from one to another, that their purport may be expeditiouſly known to the commanding officer, who muſt not neglect to have all ſuſpected and neutral ſhips chaſed, and even ſtopped by the frigates, which are always to be ſupported by one or two line-of-battle ſhips, according to the exigency of circumſtances. The progreſs of the whole fleet will be regulated by that of the worſt going ſhips; which, however, are to be abandoned, when found to cauſe too great loſs of time; for to riſk a ſmall and partial loſs, is better than to expoſe the whole fleet by delay. Between the columns, there ſhould be ſloops of war and other ſwift ſailing light veſſels, to maintain order, and keep the ſhips in their ſtations. Their particular buſineſs will be to make the tardy ſhips to ſail with greater expedition, to oblige thoſe ſhips that are out of their poſt to reſume it, and in the evening to give an account to the frigates, having charge of going the round, of thoſe which have not manœuvred well; and theſe will make their report to the commodore.

During the night, the ſame order will be obſerved, except with reſpect to the look-out frigates, which are to be called in within a certain diſtance of the fleet, and which are to be allowed lights as well as the reſt of the men of war. They are to take ſpecial care to oblige all ſtraggling ſhips to return to the convoy, and to fire, without heſitation, on all ſtrange veſſels coming from the main ſea, in order to give the alarm. Every night they are to be ſupported on the wings by ſome line-of-battle ſhips. Elements and Practice of Rigging and Seamanſhip, vol. ii. pt. 2.

CONUS, in *Conchology*, a genus in the Linnæan ſyſtem, diſtinguiſhed by that writer as having the ſhell univalve, convoluted, and turbinated; aperture effuſe, longitudinal, linear, without teeth, and entire at the baſe; pillar ſmooth. Animal a limax.

Species.

* Section *truncati*, ſpire nearly truncated.

Marmoreus. Shell conic, brown with ovate white ſpots; whorls of the ſpire canaliculated. Linn.

Inhabits the Aſiatic and American ſeas, and comprehends ſeveral diſtinct varieties. The ſhell is finely ſtriated, and varies from fulvous to blackiſh; the ſpots are often of triangular ſhape, and running into bands; whorls emarginate, and armed with ſpinous tubercles.

Imperialis. Shell whitiſh with longitudinal livid bands, and narrow belts compoſed of brown and white. Linn. *Kroonhoorn*, Rumpf. *Corona imperialis*, Argenv.

A ſcarce ſpecies. The ſhell is generally marked with two yellowiſh bands. Suppoſed to be from the Eaſt Indies.

Litteratus. Shell conic, white with brown dots. Linn. *Voluta muſicalis*, Rumpf.

Inhabits the Aſiatic ocean, and varies from white to rediſh, or yellowiſh; the ſpots or dots are uſually of a ſomewhat quadrangular form diſpoſed in rows, between which are a few pale yellow bands or cheſnut coloured lines; the ſpire is ſtriped with brown.

Generalis. Shell conic, poliſhed, ſpire flat and muricated; whorls canaliculated. Gmel.

A native of India. The colour of this ſhell varies from brown to yellow or orange, and is encircled with two, three, or four bands, marked with elongated ſpots; ſpire whitiſh, varied with undulated ſtripes, and pointed in the middle.

Virgo. Shell conic, with the baſe bluiſh. Linn.

Several varieties of this African ſpecies are deſcribed by Knorr, Liſter, and Chemnitz, from which it appears this ſhell varies from white to yellow, or yellowiſh, and is ſometimes teſſellated with white and red, or white with a ſtraw-coloured band; ſpire blue, or white marked with an ochraceous band.

Capitaneus. Shell conic, glabrous, with the baſe brown; ſpire a little convex. Linn.

Few diſtinct varieties of this ſpecies are deſcribed by Gualtieri, Bonanni, Favanne, and other writers. It is a native of Africa, and is commonly either of an olive, brown, or cheſnut, or varied with thoſe colours, and marked with one or two white bands, undulated ſpots, and numerous rows of dots; ſpire in general ſtriped. This is an Aſiatic ſhell.

Tribunus. Shell white, with three yellowiſh bands, ſpotted with cheſnut; ſpire a little convex; and the baſe tranverſely ſtriated. Gmel.

Deſcribed on the authority of Martini, who has given a figure of it in his work on Conchology; its native country is unknown. The ſhell is marked with a few waved cheſnut lines.

Miles. Shell conic, rough, with the baſe brown; ſpire convex. Gmel. *Pſeudo-arebithalaſſus*, Argenv.

This ſhell is a native of India, and is of a white or yellowiſh colour, with longitudinal undulated lines, the baſe tranſverſely ſtriated, near the ſpire a brown band, the ſpire itſelf ſpotted with brown.

Cingulum. Shell conic, yellowiſh, with a ſingle elevated belt in the middle; ſpire acute. Gmel.

Inhabits the Friendly Iſles.

** Section *Pyriformes*, &c. Pyriform with a rounded baſe, the cylinder half as long again as the ſpire.

Princeps. Shell yellow, with purpliſh-brown longitudinal ramoſe lines. Linn.

Length of this ſhell about two inches and a half; the ſpire is obtuſe and finely ſtriated tranſverſely; the body marked with two white bands which have a few brown ſpots, the reſt of the ſhell ſpotted with cheſnut. Inhabits the Indies.

Ammiralis. Shell with rough punctures at the baſe. Linn.

The varieties of this ſpecies, according to the character aſſigned it by Linnæus, are numerous beyond example in any other ſhell, amounting to nearly forty diſtinct kinds, independently of a much greater number not hitherto well defined. Among the principal varieties the following are moſt intereſting.

Larvatus, faſciis nullis, &c. Without bands, figured by Martini.

Americanus, with irregular bands, and admitting of ſeveral varieties, as thoſe having the ſhell brown, and clouded or ſpotted with white. Shell reticulated and clouded with cheſnut; white, ſpotted, dotted, and clouded with brown; white, having the bands marked with orange lines. Another ſtrong variety *anglicus*, figured in the work of Gualtieri, is of a red colour marked with numerous punctured white belts, and has the ſpire ſpotted with brown. The variety *coronatus*, deſcribed by Argenville, is diſtinguiſhed by a belt of reddiſh dots, and tranſverſe elevated lines, and is ſometimes marked with a yellow band in the middle, and numerous punctured belts; or ſometimes brown with a white band, and an oblique row of whitiſh ſpots. *Regius* has two bands, which are generally of an orange colour with darker lines, the interſtices white; ſhell with orange dots and undulated ſpots. Martini figures a variety of this kind, the ſhell of which is white with waved brown ſpots, and the bands varied white and brown; another has the bands yellowiſh with trifarious brown lines, and the ſhell white ſtriated with brown; and a third variety has the ſhell clouded white and brown, and the bands of a brown colour. In *ordinarius* the ſhell is teſtaceous ſpotted with white, the bands white, and ſomewhat reticulated with an articulated belt in the middle. *Guineenſis* has the ſhell of a ſtraw colour, the middle band marked with angulated lines in a very beautiful manner. The ſhell of the variety *ſurinamenſis* is of a bay colour with numerous dotted belts, the bands ſpotted and the lower one dotted with brown and white. This kind includes ſeveral inferior varieties. The variety *ſummus* has the ſhell of a ferruginous colour with ſcattered white ſpots, and is marked with yellow bands, very finely reticulated; it varies in the number of the regular bands. *Occidentalis* is another ſtrong variety; the ſhell teſtaceous ſpotted with white, and an articulated belt; bands yellow and reticulated. The laſt and principal variety of the conus princeps is the *cedo nulli*, a ſhell found in the South Seas in amazing variety, ſome kinds of which are however extremely beautiful and rare, and in high eſteem with amateurs. The *geographic* cedo-nulli is a fine and valuable kind, the prevailing colour of which is white, marbled with orange in a map-like manner. Another kind, called the "king of the ſouth," (*Roi du Sud*, Argenv.) is of a fine deep golden orange with a white belt, and ſeveral diſtinct circles compoſed of clear white ſpots, three of which circles are diſpoſed between the belt and the ſpire. Before the revolution in France there were three ſpecimens of this kind known in the cabinets of Paris; one in that of Madame la Preſidente de Banderille, another in that of the king, and the third, ſuperior in perfection to either, in the poſſeſſion of M. le Comte de la Tour d'Auvergne, which laſt was obtained from the Iſle of France, and was known by the title of *Le Cedo-nulli aux iſles*. But the *banded cedo-nulli* bears the higheſt value. This ſhell, called by the French *cedo-nulli a bandes*, or by ſome more emphatically *la reine du midi*, is better known in England by the name of Lyonet's cedo-nulli; it was formerly treaſured in the cabinet of that diſtinguiſhed amateur, and eſtimated at a conſiderable price, the ſum of one hundred pounds ſterling being actually refuſed by its poſſeſſor, who was nevertheleſs diſpoſed to part with it at a fair valuation. Lyonet was an ingenious naturaliſt reſident at the Hague, and, according to popular report, obtained this ſhell from the cabinet of M. de la Faille, auditor of finances to the ſtates general of Holland, at the death of that eminent collector.

A particular account of this curious ſhell is given by Argenville, who pronounces it unique; this author deſcribes it from a drawing made under the immediate inſpection of Lyonet, the original of which we have ſeen, and are ſatisfied in the accuracy of his deſcription. The ſhell from this drawing appears to be very elegant; its ſize is about that of the other varieties of the cedo-nulli, which vary from an inch and an half to an inch and three quarters in length, and meaſure rather more than three quarters of an inch in the wideſt part. The colour is yellow, divided by four diſtinct bands of marbled white, the one of which acroſs the middle of the ſhell, and another next the baſe of the ſpire, are the broadeſt and moſt beautifully variegated: the ſpire itſelf is faſciated longitudinally. At the firſt glance the yellow appears two principal bands of pretty conſiderable breadth, one above and the other below the band of marbled white which encircles the middle of the ſhell. The two laſt-mentioned yellow bands are beſet with four equi-diſtant tranſverſe ſtriæ of little prominent dots, which give the ſhell in this part a ſlightly ſcabrous appearance.

It is only in conformity with popular report, that the ſhell of Lyonet, as before intimated, is preſumed to be the celebrated cedo-nulli of La Faille's cabinet, the truth of which has been conteſted by reſpectable authority. Favanne thinks it is not the ſame, and Gerſaint poſitively declares it is not. The individual ſhell of ſo much repute in the collection of La Faille, according to the latter writers, was ſold at the ſame time, with the other articles, at the Hague, about the year 1728, and was bought by a dealer for the king of Portugal's cabinet, at a price exceeding a thouſand French livres. Hence it is imagined that Lyonet procured his famous ſhell from ſome other ſource. If we are not miſtaken in our information, there were originally two ſhells of this ſame kind in the cabinet of La Faille, who preſented Lyonet with one of them, and which, if true, at once reſolves the myſtery. The fate of Lyonet's ſhell is not exactly known; it is believed, at preſent, to enrich one of the Pariſian muſeums.

We ſhall laſtly mention a variety of the cedo-nulli, formerly in the rich cabinet of Madame de Bandeville, called *le cedo-nulli marbré*, from the beautiful variegated or marble-like appearance of its colours, which were blueiſh and violet on a ground of white. The ſhell was alſo embelliſhed with three yellowiſh zones, and beſet with a number of little roundiſh granulations of a white colour encircled with red.

VICARIUS. Shell teſtaceous, ſpotted with white, with four yellow immaculate bands, the ſecond divided angularly. Gmel. *Archithalaſſus ſecundus*, Argenv.

Said to inhabit the ſouthern ocean.

SENATOR. Shell conic, ſmooth, glabrous with obtuſe ſculptured whorls. Martini.

Native place unknown; the ſhell is yellow ſpotted with white, and marked with very numerous tranſverſe ſtriæ, compoſed of white and brown dots.

NOBILIS. Shell ſub-cylindrical, ſmooth and glabrous. Linn. *Tigris lutea*, Argenv.

This ſpecies is finely poliſhed, of a yellow or brown colour, occaſionally ſhaded with olivaceous, ſpotted with white, and marked with very minutely punctured tranſverſe ſtriæ.

GENUANUS. Shell with linear belts articulated with white and brown. Linn. *Geneſeſche toot*, Rumpf. *Jamar*, Adanſ.

Found on the ſhores of Guinea. The ſhell is red, with bands alternately teſſelated with brown and red. The "*A la papilionis*" of Argenville, called alſo by Engliſh collectors the butterfly cone, is conſidered as a variety of this ſpecies.

GLAUCUS. Shell emarginate at the baſe, and ſtriated; ſpire unarmed, with the whorls contiguous. Linn. Botervegie van Boer. Rumpf.

A native of India and Africa. The ſhell is varied with brown, cheſnut, and red ſpots, ſometimes placed in rows, and the ſpire, which is tranſverſely ſtriated, varies in being more or leſs convex, and marked with ſpots, which are ſometimes ſquare.

MONACHUS. Shell gibbous, clouded with blueiſh brown, acute, and ſtriated at the baſe. Linn. *Capucinus ſ. anicula*, Rumpf.

Suppoſed to be a native of India. Shell ſometimes marked with dots diſpoſed in rows.

MINIMUS. Shell greyiſh, ſurrounded with oblong dots. Linn.

Delineated in the works of Martini and Knorr; the native country unknown.

RUSTICUS. Shell ovate, rugged, and muricated at the baſe; the ſpire conico-convex. Linn.

There are two varieties of this ſpecies, one of which, *voluta cinerea* of Rumpfius, is without any band, the other has a band, clouded with whitiſh, and is varied with blackiſh lines and dots. This ſhell inhabits Africa.

MERCATOR. Shell ovate and white, with reticulate yellow bands. Linn. *Tilin*, Adans.

Inhabits the ſhores of Africa. Shell of moderate ſize, ſometimes yellowiſh, with brown or tawny bands.

BETULINUS. Shell ſlightly emarginate at the baſe, and wrinkled; the ſpire flattiſh and mucronated. Linn.

This is a native of India; the ſhell is rather large, and admits of ſeveral varieties, being either yellow or ochraceous, with teſſelated ſpotted bands, and intermediate lines of yellow or brown; white, with three rows of violet characters; or white faſciated, ſpotted and dotted with brown. The *Conus Meduſæ* of Martini is eſteemed a variety of this ſpecies.

FIGULINUS. Shell ſlightly emarginated at the baſe, and wrinkled; ſpire acuminated, with flattiſh whorls. Linn. *Voluta fuoſa*, Rumpf.

Length about three inches; brown, ferruginous, or yellow, and rarely olive, with darker lines; within generally whitiſh. A variety deſcribed by Knorr is of a more elongated form, the colour orange, with darker lines, and two yellowiſh bands; the ſpire reddiſh, ſpotted with black. Inhabits India.

EBRÆUS. Shell ovate and white, with black bands, compoſed of tranſverſe ſpots. Linn. *Muſica ruſticorum*, Rumpf. *Hebraica*, Argenv. *Coupet*, Adans.

Native of the ſame country as the laſt. Shell rather ſmall, and ſometimes reddiſh, with parallelogramatic ſpots, which are often cheſnut. There are ſeveral varieties of this ſpecies. It is known by the name of the Hebrew character cone, among Engliſh collectors.

STERCUS MUSCARUM. Shell emarginate at the baſe, and ſtriated; whorls of the ſpire canaliculated. Linn. *Voluta arcuata*, Rumpf.

Inhabits Aſia. This ſhell is of a long and narrow form, and white colour, with ſcattered black or red ſpots, which are ſometimes united into bands; whorls of the ſpire obtuſe, and in ſome of its varieties tuberculated.

VARIUS. Shell elongated and muricated, with the ſpire coronated and acute. Linn.

A native of the Indian ocean. The ſhell is white, clouded with brown or yellow, and granulated ſtriæ diſpoſed over the whole ſurface.

ACHATINUS. Shell elongated, very finely ſtriated tranſverſely, and variouſly clouded and ſpotted with white; ſpire ſhort, ſpotted with brown, and red at the tip. Gmel.

Several varieties of this ſhell are deſcribed by Seba and Chemnitz; the ſpecies is a native of the American ocean.

RADIATUS. Shell radiated and faſciated with white. Gmel.

Native country unknown; the ſhell is brown, pale yellow, or cinereous, and is figured by Martini.

LEONINUS. Shell with pale yellow or cheſnut ſpots; commonly marked tranſverſely with white or yellow bands, compoſed of grains or ſpots. Linn.

Found in the Indian ocean; and is a ſpecies comprehending an amazing number of varieties, as may be ſeen by the works of Knorr, Martini, Seba, Chemnitz, and others; about fourteen diſtinct varieties are aſcertained.

JASPIDEUS. Shell light olive, with multifarious white dots, and an oblique band. Martini.

This is a ſhell of an oblong form, and ſmall ſize. The native place is uncertain.

NEBULOSUS. Shell brown clouded with blue, and white ſpots. Gmel. Bonanni, &c. A doubtful ſpecies; the country unknown.

Coffeæ. Shell ſhort, brown, with two white bands; that neareſt the ſpire ſpotted with brown. Martini.

Shell of moderate ſize; country undetermined.

Amadis. Shell pale brown, with a broad band, and articulated belts above and beneath; ſpire acute, crowned with tubercles, and very finely ſtriated tranſverſely. Argenv. Zoomorph. Country unknown; ſhell varies in being more or leſs ventricoſe.

Fulmineus. Spire acute, and with the pillar-lip ſpotted with cheſnut; ſhell ſtriped longitudinally with cheſnut; baſe acute, and ſtriated obliquely. Martini.

Arachnoideus. Shell reticulated with cheſnut, with two or three darker bands; ſpire coronated and acute. Argenv. Zoomorph.

Deſcribed as an extremely rare ſhell, and probably not of this tribe. Its native place is unknown.

Costatus. Shell brown, with a white band, undulated with reddiſh, with thick and broad ſtriæ; ſpire nodulous, with a granulated band. Gualt. Country unknown.

Leucostictus. Shell white, clouded, ſtriped, and ſpotted with brown, and marked with numerous rows of white and brown dots; ſpire crowned with tubercles. Gmel.

Inhabits the Indian ocean; and has the ſpire of the ſhell ſometimes acute.

Citrinus. Shell citron colour, with black lines interrupted beneath; ſpire crowned with tubercles, and with the baſe white. Gmel. Inhabits the Caraccas.

Insularis. Shell white, with cheſnut clouds, ſpots, and dots; and ſpire acute. Gmel. Country unknown.

Coronatus. Shell with alternate articulate belts, and teſſellated ſpots; ſpire crowned with tubercles. Gmel.

A ſmall and extremely variable ſpecies, and which is oftentimes marked with a white band. Its country is unknown.

Punctatus. Shell with two yellowiſh-brown bands, and numerous lines of dots; ſpire varied with yellow dots and lines. Knorr.

Zeylanicus. Shell ſnowy, with roſy and brown clouds, and numerous articulated belts, varied with white and cheſnut: ſpire pointed. Martini. The baſe of this ſpecies is grooved obliquely.

Solidus. Shell conic, thick, tranſverſely ſtriated, clouded with white and brown, with a broad white band, and pyramidal ſpire; the whorls canaliculated. Chemn.

*** Section *elongati*, &c. Elongated and rounded at the baſe; the cylinder twice the length of the ſpire.

Clavus. Shell with convex ſmooth ſtriæ; the baſe blueiſh. Gmel.

An extremely rare ſpecies, found in the Indian Ocean. The ſhell is long, yellow, with white ſpots, and two deeper bands ſpotted with white; the ſpire ſpotted, and gradually tapering to an obtuſe point.

Nussatella. Shell ſomewhat cylindrical, red, not crowned with tubercles, rough, with tuberculated ſtriæ. Gmel. *Terebellum granulatum*, Rumpf.

This is a ſcarce ſpecies, and inhabits the iſland Nuſſatello in Aſia. The ſhell is pale, clouded, and ſpotted with red, or rarely entirely white; with yellowiſh-brown, granulated, tranſverſe ſtriæ; and the ſpire ending in an obtuſe point.

Terebellum. Shell white, ſhaded with blue, ſubcylindrical, with annulated ſtriæ, and yellow bands. Gmel. Inhabits the Indian ſeas.

Fusus. Shell fuſiform, white tranſverſely ſtriated. Gmel. Martini, &c.

Coccineus. Shell red, with tranſverſe lines dotted with black, with a white band and ſpire, ſpotted with red. Gmel., Knorr, &c.

Caetus. Shell ſomewhat cylindrical, with annulated ribs, red, with darker clouds, and bars of white; ſpire ſpotted. Gmel.

Figured by Liſter and Knorr, and is ſuppoſed to be a variety only of C. *granulatus*. Its country is unknown.

Granulatus. Shell rough, unarmed; ſtriæ ſmooth and grooved. Linn. *Voluta granulata*, Rumpf.

Inhabits the African ocean. Shell red, with large ſulcations, faſciated with white and purple linear dots.

Ochroleucus. Shell ſub-cylindrical, yellow; the baſe obliquely ſtriated with a contiguous white band; ſpire pointed, and marked with ſtriped ſpots. Gmel.

The native country is unknown. A variety of it is found of a cheſnut colour, varied with decuſſating ſtriæ, dotted with red.

Laevis. Shell rufous, with fulvous ſpots, and tranſverſe ſtriæ; ſpire ſpotted with yellow; baſe obliquely ſtriated. Gmel., Valent. &c.

Affinis. Shell blueiſh-white, with four fulvous linear bands, and intermediate dull purple dots or marks. Martini.

Violaceus. Shell white, clouded and banded with violet; rays pale brown. Martini.

Polyzonias. Shell white within; externally yellowiſh-brown, and rough, with very fine granulated lines; white band at the ſpire, denticulated beneath; another at the baſe paler, and numerous filiform bands. Born.

Bifasciatus. Shell white, with angular cheſnut lines, and two orange bands; ſpire prominent; baſe ſurrounded with orange lines, and intermediate teſſellated ſpots. Born.

Niveus. Shell conic and ſnowy; ſpire prominent and coronated; aperture large. Born.

Arausiacus. Shell not crowned, ſmooth, with whitiſh bands; whorls grooved at the tips. Gmel. *Oranjen admiraal*, Rumpf.

A beautiful and rare ſpecies found in India. The colour is in general whitiſh, with two or three orange bands, and white lines, teſſellated with brown ſpots; ſpire with oblong ſpots of red, white, and brown.

Magus. Shell ſub-cylindrical, with longitudinal bands dotted with white. Linn. *Voluta maculoſa*, Rumpf.

A native of India. Shell white, with dotted lines, and oblong, cheſnut, yellow, and brown ſpots; ſpire acute and ſpotted.

Striatus. Shell ovate-oblong, gibbous, clouded, with very fine parallel brown ſtriæ. Linn. *Voluta tigerina*, Rumpf. *Melar*, Adans.

Common upon the coaſt of Africa. Shell four inches long, ſnowy, with ſometimes reddiſh or yellowiſh ſtriæ; the baſe emarginate and tranſverſely ſtriated.

Textile. Shell reticulated, with yellow veins, and ſpotted with yellow and brown. Linn. *Pannus aureus*, Argenv. *Leman*, Adans.

A native of Aſia. Chemnitz deſcribes a variety of this ſpecies, of a white colour, with three orange bands; and another of a bloom colour, with two darker bands.

Aulicus. Shell white, with brown reticular veins, and interrupted longitudinal bands. Linn. *Nigella*, Argenv.

Nearly allied to the former, and ſuppoſed by ſome to be a variety: it likewiſe inhabits Aſia, and admits of many varieties, ſeveral of which are figured by Martini.

Thomæ. Shell ſmooth, white, with bay characters, and rows of dots, and three white belts and ſpots; tip reddiſh; ſpire conic, with grooved whorls. Gmel.

A native of the Indian ſeas.

**** Section. Shell ventricoſe in the middle, and narrow at each end.

Sinensis. Yellow, ocellated with white, and tranſverſely ſtriated at the baſe. Gmel., Regenſ., &c.

***** Section. Shell ventricoſe, and tinkling when thrown down on its back.

Spectrum. Shell blueiſh, with yellow clouds, and yellowiſh-white dots and ſtriæ. Linn. *Voluta ſpectrorum*, Rumpf.

Inhabits the Aſiatic ſeas. Four diſtinct varieties are figured by Chemnitz.

Cullatus. Shell yellow, clouded with white. Linn. *Potan*, Adans.

Native country unknown. Shell thin, often ſpotted, clouded, or barred, and more or leſs ventricoſe; aperture large and blueiſh; ſpire ſometimes flat, ſometimes acute.

Tulipa. Shell oblong, gibbous, ſmooth; aperture gaping. Gmel. *Tulipa*, Argenv.

Inhabits India, Africa, and South America. Shell not coronated with tubercles; white, with a few clouds of blueiſh, brown, yellow, or red, and interrupted lines; aperture blueiſh; baſe obſoletely ſtriated obliquely; ſpire acute, ſmooth, ſpotted, and finely ſtriated tranſverſely.

Geographicus. Shell oblong, gibbous, and coronated; aperture gaping. Gmel. *Nubecula*, Rumpf. *Textile ſericum*, Argenv. *Nubecula*, *tulipa gallorum*, Klein. *Salar*, Adans.

A rare ſpecies found in the Indian and African ſeas. The ſhell is of a ſomewhat cylindrical form, wrinkled at the baſe, and rather narrower, pellucid, white; ſpotted and clouded with brown; aperture white; ſpire ſometimes roſy.

Nubecula. Shell white, clouded and ſpotted with orange, and ſcattered white dots; ſpire prominent and acute. Linn.

Spurius. Shell white, with alternate rows of irregular cheſnut or blackiſh ſpots, and interrupted punctured bands. Gmel., Gualt.

Vexillum. Shell brown, ſhaded with white, and marked with an interrupted white band. Rumpf., &c.

Ventricosus. Shell brown, barred with white, beneath narrower, ſhaded with blueiſh, and ſmooth; ſpire conic and exſerted. Kaemm. Country unknown.

CONUSANCE, in *Law*, See Cognizance.

CONUSOR. See Cognisor.

CONVULSIONS, in *Pathology*, from *convello*, *I rend* or *tear*, conſiſt in violent, involuntary, and preternatural contraction and motion of the muſcular fibres, in any part of the body.

By modern phyſicians, convulſions have been divided into two claſſes, under the terms of tonic and clonic, or *ſpaſtici* and *agitatorii*, according as the contractions are rigid, not alternating with relaxation, or throw the muſcles into a ſtate of conſtant motion, being immediately ſucceeded by relaxation, and again returning, alternately. Theſe two ſpecies of morbid contraction of the muſcles are generally diſtinguiſhed at preſent by the terms, *ſpaſm*, which denotes the fixed contraction, and *convulſion*, which implies the preternatural motion. The term σπασμὸς, *ſpaſm*, was applied, however, by the Greek phyſicians, to the convulſive motions; and the rigid contraction was denominated τέτανος, *tetanus*. "Frigus modo nervorum diſtentionem, modo rigorem inſert; illud σπασμὸς, hoc τέτανος Græcè nominatur." Celſus de Med. lib. ii. cap. 1. The word *nervus* ſignified a tendon, as well as an elongation of the brain and ſpinal marrow, which is now excluſively called a nerve: hence the Roman name for convulſions, which ſignifies diſtention of the tendons. And accordingly, thoſe ſlighter convulſive motions of the muſcles of the arms, which occur in fever, and occaſion a playing of the tendons under the finger of a perſon, feeling the pulſe, are now called a ſtarting of the tendons, *ſubſultus tendinum*. But theſe different forms of ſpaſm and convulſion are frequently mixed, or paſs into each other; and ſimilar cauſes, affecting the brain and nervous ſyſtem, produce both the one and the other.

It were vain to attempt to give an explanation of the nature or proximate cauſe of convulſive motions; ſince we are ignorant of the nature of the nervous power, or of that medium by which the muſcles are connected with the common ſenſorium, and the volition of the mind is communicated to the muſcles. We muſt be content with the obſervation of facts: the minute operations of nature are inſcrutable. The mechanical phyſicians had, indeed, no difficulty in accounting for the morbid, as well as the healthy operations of the nervous ſyſtem: their imagination furniſhed them with a cauſe for every effect. Thus they *ſuppoſed*, like the natural philoſophers, the exiſtence of a ſubtile, ætherial fluid, the motions and vibrations of which produced all the effects which they obſerved. By farther ſuppoſition, different phyſiologiſts explained the mode in which this gratuitous fluid operated. Borelli fancied that there might be oblong veſicles in the fibres of the nerves and muſcles, which were rendered ſpherical by the force of the nervous fluid, and therefore ſhorter. Others imagined that the influx of the nervous fluid ſeparated the parallel fibres of the muſcles from each other, and thus ſhortened the length of the whole. But it were uſeleſs to enumerate the various futile hypotheſes, which originated in an erroneous philoſophy. All that we know on this ſubject is, that ſome of the muſcles of the body contract, in a ſtate of health, by the will of the mind, as thoſe of the trunk and extremities:—others, apparently without the intervention of an act of volition, although ſubject in a great meaſure to the will, in conſequence of a local ſenſation; as the diaphragm, and the other muſcles of reſpiration; the eyelids, in nictitation, &c.:—and others, again, are excited to contraction, altogether independently of the will, by an irritation ſo obſcure, as to excite no perception in the mind; as the heart, which continues its unperceived motions, in conſequence of the irritation or ſtimulus of the diſtending blood, which is returned into its cavities by the veins. The contractions, produced by one or other of theſe cauſes, are regular in force and velocity, according to the degree of excitement; are always ſoon ſucceeded by a ſtate of relaxation; and are not repeated, except when the will or the irritations again operate. In the morbid or convulſive ſtate, the contractions of the muſcles, ordinarily depending on the will, are excited without the concurrence of the will, or in a way contrary to what the will intends; and in the other inſtances, they are excited diſproportionately to the action of the uſual and natural irritations. Hence it may be concluded, without any gratuitous hypotheſis, that when theſe convulſive motions are excited, independent of, or in oppoſition to, the will, ſome change in the condition of the ſeat of volition, the brain, and its elongations, the nerves, has occurred; and, if the convulſions are partial, that ſome great local irritation has been applied.

Now, although it be confeſſed that the actual condition of the brain, which occaſions convulſions of the moving fibres, be unknown, as well as its condition and mode of operation in health; yet certain conditions of the body, in general, have been obſerved to be connected with the occurrence of convulſions, which lead to a knowledge of the ſtate of the brain in the groſs, and ſerve as valuable guides in our practice in theſe diſeaſes.

Convulſions have been chiefly obſerved to occur, when the body was in a ſtate of repletion, inanition, or great irritation. It may ſeem inexplicable, that the two oppoſite conditions of repletion and inanition ſhould give riſe to ſimilar morbid appearances; but the knowledge of the fact, which is eſtabliſhed beyond a doubt, is ſufficient for our practical purpoſes. We ſhall illuſtrate the operation of each of theſe ſtates in producing convulſive diſeaſes.

1. *Repletion* of the ſyſtem at large, or of the brain in particular, is a ſtate in which convulſions frequently occur. Numerous inſtances are on record, in which epilepſy has occurred, where a general plethoric ſtate of the conſtitution was preſent. Epileptic convulſions have ſometimes ſucceeded apoplexy, which is known to originate in overturgeſcence of the brain. Every occaſional fulneſs, or unuſual impulſe of the blood into the veſſels of the brain, ſuch as from a fit of anger, the heat of the ſun, or of a warm chamber, violent exerciſe, a ſurfeit, or a fit of drunkenneſs, are frequently the immediate exciting cauſes of convulſions. (Cullen. Firſt Lines, § 1296.) Hence alſo, in inflammatory fevers, as in the eruptive fever of the ſmall-pox, where the blood is carried to the brain more abundantly, and with greater impetus than in health, convulſions are frequently produced; eſpecially where the circulation is hurried by a hot regimen. The ſuppreſſion of accuſtomed diſcharges, or the omiſſion of habitual evacuations, have alſo been the occaſion of convulſive affections, in conſequence of the general plethora which enſues. But the moſt marked and ſtriking inſtance of convulſions, induced by repletion, occurs in the puerperal ſtate. They generally come on in the early ſtage of labour, and are attended with fulneſs and diſtention of the features, and other obvious marks of determination of blood to the head; they ſpeedily ceaſe when the delivery is accompliſhed, if they do not prove fatal before that takes place; and copious blood-letting is the only effectual remedy. In all thoſe inſtances, indeed, which have juſt been mentioned, the good effects of evacuating medicines, of a ſpare diet, and cool regimen, in removing the diſeaſes; and the bad conſequences which have enſued, under the employment of an oppoſite treatment, point out repletion as the cauſe of the miſchief. This is, alſo, ſtill more clearly aſcertained from the diſſection of thoſe, who have died in conſequence of convulſions, occurring under ſuch circumſtances; marks of a congeſtion in the brain having been generally obſerved. See EPILEPSY.

2. *Inanition* is a frequent cauſe of convulſions. It has been obſerved from the earlieſt ages, that convulſions invariably precede death, when it is occaſioned by loſs of blood; and the fact is daily exemplified in ſlaughter-houſes, when animals are killed by opening the large blood veſſels. Hippocrates ſtates, in his Aphoriſms, Sect. v. Aph. 3, that convulſions, or hiccough (which is, in fact, a convulſion of the diaphragm), ſucceeding a great hæmorrhage, are dangerous, and he repeats the obſervation in Sect. vii. Aph. 9. From this cauſe convulſions ſometimes occur in the puerperal ſtate, where great hæmorrhage from the uterus has occurred. But in ſuch inſtances, the countenance, ſo far from being fluſhed, with a fulneſs of the features, is pallid, and the features are ſharp and ſunk; there are cold ſweats, and other ſymptoms of exhauſtion, which mark the diſtinction between this ſort of convulſive diſorder, and the proper puerperal convulſions, mentioned under the former head. In theſe convulſions from inanition, the contrary remedies, cordials, and powerful ſtimulants, largely and frequently adminiſtered, afford the only means of ſaving life. "Si fluxui muliebri," ſays Hippocrates, "animi deliquium et convulſio ſupervenit, malum." Sect. v. Aph. 65. Other great evacuations alſo excite convulſions; ſuch as great diſcharges from the bowels by purging. In the early periods of the hiſtory of medicine, when the limited catalogue of the materia medica debarred the phyſician from the choice of expedients, according to the circumſtances of the caſe, it would appear that this unfortunate conſequence of a violent purgative was by no means uncommon, ſince we find it often alluded to by Hippocrates. "Convulſion from Hellebore is fatal." Sect. v. Aph. 1, and again, he obſerves, in Sect. vii. Aph. 25; "Convulſions from a purge are fatal." Happily the numerous articles of mild operation, which we now poſſeſs, render ſuch an occurrence unknown to the phyſicians of modern times. Convulſions have been, likewiſe, obſerved to occur, in conſequence of exhauſtion of the animal powers, by other means; ſuch as by exceſſive fatigue; by want of food; by long continued and ſevere mental exertion; &c.

The cure of convulſions, occaſioned by inanition, from any of the cauſes juſt ſtated, will obviouſly conſiſt, in the uſe of ſuch remedies as will put a ſtop to the evacuations; in the adminiſtration of cordials and ſtimulants, to counteract the preſent failure of the vital powers; and in the frequent ſupply of moderate quantities of a cordial and nutritious aliment, to reſtore the maſs of circulating fluids, and the ſtrength of the body. Reſt, food, and relaxation, will be the remedies required in the laſt-mentioned inſtances.

But 3, *Irritation*, corporeal and mental, is the moſt fruitful ſource of convulſions. The degree of corporeal irritation, which is ſufficient to occaſion convulſions, varies greatly; not only according to the peculiarities of age, and conſtitution, but according to the part to which it is applied, and ſometimes according to circumſtances, which are not obvious. Sometimes the irritation amounts to ſevere agonizing pain; more commonly to a moderate degree of uneaſineſs; and frequently it is ſuch as to excite no perception: ſometimes it is a titillation, or attended with ſenſations on the whole pleaſurable. It may excite convulſions of the muſcles in general, when applied to the brain itſelf; or to other parts of the body, as to the bowels, ſtomach, kidneys, and other viſcera; to the gums, the ſkin, and the organs of ſenſe.

Convulſions are among the moſt common ſymptoms of irritation of the brain itſelf, either from external or internal cauſes. Thus they are frequently excited by blows, or wounds, on the head; by fractures of the cranium when a portion of the bone is depreſſed, or fragments of it are driven in upon the membranes of the brain; by effuſions of blood, lymph, ſerum, or pus, in the ventricles or on the ſurface; by bony excreſcences from the internal ſurfaces of the ſkull; or by tumours, thickening, or abſceſſes, in the membranes or ſubſtance of the brain. Mechanical injuries of the nerves, which are elongations of the brain, have alſo given riſe to general convulſions.

Irritations of parts diſtant from the ſeat of ſenſation and voluntary motion, produce the ſame effects. Thus wounds of the ſkin, and of the muſcles and tendons in the extremities, occaſion the moſt painful and fatal of all convulſive affections, the *tetanus:* and it is remarkable, that it is not a large diſcharging wound, which in general excites this diſeaſe; but a ſuperficial injury, or a wound juſt healing, when the irritation would ſeem to be leſs powerful. In this diſeaſe, all the antagoniſt muſcles of the body are ſeized at once with a convulſive action, ſo that the trunk and limbs become perfectly rigid, and the jaw is locked. Sometimes the muſcles of the back overpower their antagoniſts, the body is then bent backwards like a bow, and the patient reſts on the head and the heels; this ſtate is termed *opiſthotonos*. Sometimes, on the contrary, the action of the abdominal muſcles is moſt powerful, and the body is then bent forwards in a ſimilar manner; this condition is called *emproſthotonos*. (See theſe articles.)

Several inſtances of convulſions are related by authors, in which ſtones, of ſharp and irregular figures, were found after death in the urinary bladder, or ſticking in the pelvis of the kidney, or in the courſe of the ureters. In others, convulſions, which had occurred in conſequence of ſuch irritations, ceaſed upon the diſcharge of calculi with the urine.

Irritations in the alimentary canal are very frequently the cauſe of general convulſions, more eſpecially in young children. In children, indeed, it has been ſaid that convulſions are not to be conſidered ſo much a diſeaſe themſelves, as the indication of diſeaſe in the bowels, or other parts. (Med. Obſ. and Inq. vol. iii. p. 292.) The preſence of worms, of undigeſted aliment, of morbid ſecretions, or even a retention of the natural fæces, by conſtipation, are common cauſes of convulſions at an early age. The retention of the meconium is ſaid to occaſion the locked jaw of new-born infants, in warm climates, the *triſmus naſcentium* of authors. Some children, in fact, are ſo irritable during the few firſt years of their life, as to be thrown into convulſions by very ſlight cauſes of irritation; a diſpoſition which is only removed, as the conſtitution becomes ſtrengthened by age. The irritation of the riſing teeth, when the gums do not readily yield to their preſſure, has been frequently obſerved to excite convulſions in children, which were removed on the appearance of the teeth above the gum, or by the diviſion of the gum by means of a lancet. For it is remarkable, that the greater temporary irritation of a cutting inſtrument is borne, without any convulſion being excited, while the conſtant uneaſineſs of the irritating tooth had frequently been productive of the convulſions. In the ſame way, when convulſions are occaſioned by the irritation of worms, or of undigeſted food, in the inteſtines, the additional irritation of a cathartic medicine ſhall not increaſe the convulſive affection, which ceaſes, when its operation is completed. In the treatment of the convulſions of children, where the irritating cauſe is obvious, but cannot be inſtantly removed, the convulſive motions may be frequently ſuſpended in the mean time, by immerſion in the warm bath, by warm fomentations, or by the uſe of a ſmall doſe of an opiate, proportioned to the age and ſtrength of the child, and the violence of the diſeaſe. But ſuch meaſures are only palliative; the radical cure will depend upon the removal of the cauſe of irritation.

In conſtitutions of peculiar irritability, certain irritations of the organs of ſenſe have given riſe to convulſions. Thus in regard to the ſenſe of touch, a caſe is related by Van Swieten in which titillation of the ſoles of the feet of a young girl, excited convulſions: he alſo mentions inſtances of the ſame effects being produced by a ſudden expoſure to great light, or great noiſe; a boy was thrown into convulſions by the unexpected ſound of trumpets. Certain powerful odours have occaſioned convulſive motions when applied to the organ of ſmelling. It ſeems to have been a cuſtom formerly, ſays the author juſt mentioned, for thoſe who purchaſed ſlaves, to try them with the ſmell of the jet-ſtone, in order to diſcover whether they were ſubject to the epilepſy. Aretæus has remarked that by this odour the epileptic paroxyſm was excited; and Apulius, who was accuſed of magic, in pleading his own cauſe, made the following obſervation. "But if I wanted to throw down an epileptic perſon in a fit, what need could there be for a charm to do it? ſeeing the jet-ſtone, when it is burnt, as I read in phyſical authors, diſcovers this diſeaſe effectually; and by the ſmell of it they commonly try the health of the ſlaves in the markets." Van Swieten. Com. § 1075.

Many poiſons, eſpecially the vegetable poiſons, by their action on the nervous ſyſtem, when taken into the ſtomach, produce the moſt terrible convulſions. The cicuta aquatica, or water-hemlock, is ſaid by Wepfer to have been eaten by ſeveral children, who miſtook the roots for parſnips; they were all ſeized with ſevere convulſions, which proved fatal to two of them; the reſt having been made to vomit, and eject the poiſon from the ſtomach, ſpeedily recovered. Thus vegetable narcotics, even opium itſelf in an over-doſe, have produced ſimilar effects.

Mental irritations, or violent emotions of the mind, frequently give riſe to general convulſions, eſpecially in females, and thoſe of hyſterical habits. The influence of the mind on the body is too obvious to require much illuſtration. The actions of the heart, the circulation of the blood, and the functions of the viſcera, are variouſly modified by emotions of the mind, and no organ is more fully affected by them in its functions than the brain itſelf. Different emotions ſeem to affect the ſyſtem in different and even oppoſite ways; ſome rouſing it to actions of unuſual vigour, quickening the circulation, and ſtrengthening the powers of volition; others, again, paralyſing its ſtrength, and giving languor to all its motions. Hence the paſſions have been divided into two claſſes, exciting, and depreſſing paſſions. Now theſe oppoſite paſſions, which ſeem to produce the ſame effects as *repletion* on the one hand, and *inanition* on the other, alike excite convulſions of the body. This may be exemplified in the leading paſſions, anger, and fear, both of which are occaſionally the cauſes of convulſions. In a man under the influence of the *excitement* of anger, the heart beats with greater force and celerity; the pulſe is fuller, ſtronger, and ſwifter; every part ſwells and grows broader; a greater heat overſpreads the whole body; almoſt every muſcle is extended; the eyes are prominent from their ſockets, and look fierce and ſparkling, being charged with blood. Theſe ſymptoms imply a correſponding fulneſs and force in the veſſels of the brain, which, when carried to a certain extent, induce convulſions. On the contrary, a man under the *depreſſion* of fear, grows pale and cold, and ſhrinks in every part of the body; his pulſe is quick, but ſmall and unequal; the heart palpitates; the lungs are oppreſſed, and ſobs and ſighings follow; his ſtrength fails him; his whole body trembles, and he is ſcarcely able to articulate. Theſe phenomena ſhew a depreſſion, a collapſe of the powers of life, reſembling that which occurs from inanition, and, like that, producing ſometimes a general convulſion. See Swieten Com. in § 104. Many examples might be quoted of the convulſive attacks occaſioned by theſe paſſions, and eſpecially by fear. We ſhall mention one inſtance from the latter cauſe, for the ſake of illuſtrating the effects of another principle, the aſſociation of ideas, in re-exciting convulſions, thus originally produced. A boy was ſo much frightened by a large dog jumping upon him, that he preſently fell down attacked with epileptic convulſions: afterwards, the paroxyſm was brought on by the ſight of any large dog, or even by hearing him bark. This effect of aſſociation is frequently obſerved in a minor degree; thus, any ſubſtance uſed as a vehicle for an emetic medicine, will, in ſome perſons, when taken alone, excite ſickneſs for ſome time afterwards. Van Swieten affirms that he has ſeen a perſon, who, after having frequently taken a nauſeous purging draught, upon ſeeing the cup out of which he took it, not only ſhuddered, and became ſqueamiſh, but likewiſe had ſeveral ſtools; thus the ſole idea of a nauſeous remedy being renewed, ſupplied the place of a purge, and diſturbed the whole body. Comment. in § 1075.

There is another prolific ſource of convulſive affections, which muſt not be overlooked in deſcribing the mental cauſes of theſe formidable diſorders; namely, the principle of *imitation*. This principle ſometimes operates alone; ſometimes its operation is combined with an impreſſion of fear: and ſometimes with various other ſtrong impreſſions made on the imagination. This involuntary imitation is the ſource of almoſt all that is learnt in infancy; and its importance in the formation of character, has been well illuſtrated by Dr. Aikin. See Athenæum, No. xiii. Jan. 1808. In after-life we all experience its operation, in the irreſiſtible propenſities to yawn, to laugh, to weep, with others. Hence much of the effect of theatrical repreſentations, eſpecially crowded audiences: hence alſo the facility with which a *panic* ſpreads among an army of ſoldiers; and hence the power, on the one hand, and the cowardice, on the other, of a *mob*. This tendency to receive impreſſions and emotions involuntarily from others, and more eſpecially, when they are accompanied with corporeal motions, and the tendency to repeat thoſe motions involuntarily ourſelves, are principles rooted in the human conſtitution; and upon them much of the hiſtory of inſurrections, and alſo of the propagation of religious enthuſiaſm, depends, as well as the minor circumſtances of convulſive diſeaſes.

Every phyſician has witneſſed the effect of the ſight of an hyſterical convulſion, on other women prediſpoſed to that diſeaſe. It is not uncommon to find ſeveral women thus convulſed, one after the other, from this cauſe. We have even known the ſcream of one woman, ſeized with an hyſterical paroxyſm, excite convulſions in another, who heard it in a different room. The well-known caſes which occurred in the orphan-hoſpital at Haerlem, under the care of Dr. Boerhaave, ſhew the extenſive operation of this principle, and alſo that theſe imitative attacks may be effectually prevented, by exciting a ſtrong counter-impreſſion in the mind. That celebrated phyſician, finding that epileptic convulſions, which had occurred in one boy, attacked, one after another, all the boys who witneſſed the paroxyſms, by threats of inflicting ſevere bodily pain on the firſt who ſhould be attacked with theſe fits, ſucceeded in preventing the recurrence of the epilepſy.

This principle is ſtill farther exemplified in the epidemical convulſions which have occurred at different times in different countries. In ſeveral diſtricts of Scotland ſuch epidemics have frequently appeared. The Rev. W. Archibald, parochial clergyman of Unſt, the moſt northerly of the Shetlands, gives the following account of epidemic convulſions which occurred in his pariſh. “There is a ſhocking diſtemper, which has of late years prevailed pretty much, eſpecially among young women, and was hardly known thirty or forty years ago. About that period only one perſon was ſubject to it. The inhabitants give it the name of convulſion fits; and indeed, in appearance, it ſomething reſembles an epilepſy. In its firſt riſe, it began with a palpitation of the heart, of which they complained for a conſiderable time; it at length produced ſwooning fits, in which people ſeized with it would lie motionleſs upwards of an hour. At length, as the diſtemper gathered ſtrength, when any violent paſſion ſeized, or on a ſudden ſurpriſe, they would all at once fall down, toſs their arms about, writhe their bodies into many odd ſhapes, crying out all the while moſt diſmally, throwing their heads about from ſide to ſide, with their eyes fixed and ſtaring. At firſt this diſtemper obtained in a private way with one female, but being ſeized in a public way at church, the diſeaſe was communicated to others, but whether by the influence of fear or ſympathy is not eaſy to determine. However this was, our public aſſemblies, eſpecially at church, became greatly diſturbed with their outcries. This diſtemper always prevails moſt violently during the ſummer-time, in which ſeaſon, for many years, we are hardly one ſabbath free.” The Rev. Mr. Morriſon, giving an account of a ſimilar epidemic in his pariſh of Delting, ſays, “It moſt commonly attacks them when the church is crowded, and often interrupts the ſervice in this and many other churches in the country. On a ſacramental occaſion, fifty or ſixty are ſometimes carried out of the church, and laid in the church-yard, where they ſtruggle and roar with all their ſtrength for five or ten minutes, and then riſe up without recollecting a ſingle circumſtance that happened to them.” Statiſtical Acc. of Scotland, vol. i. p. 385. See Edin. Med. and Surg. Journ. N° xii. In another pariſh, Northmaven, a cure is ſaid to have been effected, as in the hoſpital at Haerlem, by a ſtrong counter-impreſſion upon the mind. “The cure is attributed to a rough fellow of a kirk-officer, who toſſed a woman in that ſtate, with whom he had been frequently troubled, into a ditch of water. She was never known to have the diſeaſe afterwards, and others dreaded the like treatment.” Stat. Acc. vol. xii. p. 363.

A ſimilar prevalence of convulſive affections, which occurred on the eſtates of the earl of Uxbridge and Holland Griffith, eſq. in the iſle of Angleſea, was checked by the judicious precautions recommended by Dr. Haygarth, from a knowledge of the principle which we are illuſtrating. He adviſed that all girls and young women ſhould be prevented from any communication with perſons affected with thoſe convulſions, and that thoſe who were ill ſhould be kept ſeparated as much as poſſible. See Treat. on the Imagination as a Cauſe and as a Cure of the Diſorders of the Body. Bath, 1800.

This principle of imitation, eſpecially when the imagination is ſtrongly excited by images of terror or ſuperſtition, has been reſorted to by deſigning men for the purpoſes of impoſing on the public credulity, with a view to their own profit. Upon this was founded the ſucceſs of Meſmer, De Mainauduc, and other empirics, in the diſgraceful practices of animal magnetiſm, as it was called; the nature and impoſition of which were fully detected and expoſed by the commiſſions appointed by the French king for the purpoſe of the inveſtigation. The celebrated Dr. Franklin was one of theſe commiſſioners, and his report has fully developed the myſtery of the magnetizers. By the aid of circumſtances, of ſituation, gloom, &c. and by their own enthuſiaſm, they gradually worked on the minds of their company, who were already pre-diſpoſed to receive any impreſſion, for they did not operate on ſingle individuals, until they brought them, mind and body, to a ſtate of extreme irritability; then, aſſuming extravagant geſtures and violent motions, the ſpectators were led to an involuntary imitation, and as ſoon as one of the party ſhewed any ſymptoms of violent or convulſive exertion, the reſt were ſpeedily affected in the ſame way. This was called the criſis, and the operation was conſidered as complete. Dr. Franklin ſhewed, that, without the aid of local circumſtances, of numbers, &c. the powers of the magnetizer amounted to nothing.

It were unneceſſary to purſue this illuſtration farther, or it might be ſhewn that the propagation of religious enthuſiaſm and fanaticiſm is effected by the ſame means; is frequently connected with convulſive motions, or frantic geſtures, amounting nearly to convulſions; whence we find jumpers, whirlers, and originally quakers, as the diſtinguiſhing appellations of ſects; and that it depends much upon the contagion of the principle of imitation among crowded aſſemblies, for its ſucceſs.

But to return to the ſubject of convulſions, more ſtrictly within the ſphere of pathology. We have mentioned the indications and means of cure, in moſt caſes, as they occurred. In convulſions, which come under the two firſt heads, as ariſing from repletion and inanition, it muſt be obvious, that an evacuating ſyſtem muſt be adopted in the firſt, and the contrary, or a ſyſtem of ſupport and nutrition, in the ſecond. The individual expedients to be adopted, on either of theſe occaſions, will readily ſuggeſt themſelves, according to the peculiar circumſtances of the caſe. In convulſions, which ariſe from irritation, the diſcovery and removal of the irritating cauſe, where it is of a nature to be removed, is not leſs obviouſly requiſite for the cure. But in the mean time, before any of theſe intentions can be fulfilled, the violence of the convulſive motions may continue, ſo as to injure the body, or deſtroy life. It is deſirable, therefore, that ſome palliative meaſures ſhould be adopted; and theſe are chiefly the uſe of medicines of the antiſpaſmodic claſs, ſuch as opium, muſk, æther, and other powerful ſtimulants; the uſe of the warm bath; or of the oppoſite expedient, the cold bath. Of theſe remedies, with the exception of the laſt, little is required to be ſaid; the efficacy of the former being well underſtood. But as the cold bath is a powerful expedient, and can be often reſorted to more ſpeedily than the others, it may be neceſſary to mention the nature of its powers. Dr. Currie, from an experience of eight years, aſſerts that the cold bath is very efficacious in removing the convulſions of children, whether the diſorder originates in worms or other cauſes; that it ſeldom fails in ſtopping the paroxyſms, at leaſt for ſome time, thereby giving an opportunity of employing the means fitted to remove the particular irritation. Several caſes of tetanus have alſo been cured by the cold bath of late years. In the convulſions of hyſteria, the cold bath, or indeed a plentiful affuſion of cold water, is an almoſt infallible remedy. Dr. Currie obſerves, that the efficacy of the cold bath in convulſive diſorders is the greateſt, when it is employed during the preſence of the convulſion; and alſo that it is of greater efficacy in general convulſive affections, than in thoſe which are only partial. In chorea ſancti Viti, for inſtance, it has been frequently tried without any ſucceſs. See Currie, Reports on Water, &c. Append. p. 13. *et ſeq.*

Where the ſource of irritation is not diſcoverable, beſides theſe palliative means, other medicines are commonly employed to give ſtrength and vigour, and to leſſen the irritability of the moving fibre, ſo as to render it leſs ſuſceptible of being excited to extraordinary action. The various articles of tonic and corroborant medicine have been adminiſtered with this view, but moſt frequently, the metallic ſalts and oxydes; as the ſulphates of zinc, and iron, and copper; the oxyde of zinc; and even the cauſtic nitrate of ſilver has been employed in ſmall doſes.

CONVULSIVE DISEASES, thoſe diſeaſes in which convulſions are the leading ſymptoms. See CONVULSIONS. Theſe diſeaſes have received different appellations, and alſo require different methods of treatment, according to the varieties of their form. Some conſiſt of general convulſions of the whole muſcular ſyſtem, as *tetanus*, *epilepſy*, ſome forms of *hyſteria*, &c.; others are diſtinguiſhed by the convulſions being confined to particular parts; as *triſmus*, when the muſcles of the jaw are affected with ſpaſm; *chorea*, or St. Vitus' dance. Hiccough, and even cough, may be conſidered as partial convulſions. See theſe articles reſpectively.

CONVULSIVE *Aſthma*. See ASTHMA.

CONWAY, in *Geography*, a river in North Wales, called by Ptolemy and Antoninus *Conovius*. *Kynwy*, in the ancient Britiſh language, ſignifies the *great river*, from which are derived the words *Conwy* and *Conway*. This ſtream, conſidered one of the fineſt in Europe, riſes in the mountains of Penmachno, out of Llyn Conwy, and is navigable for ſmall veſſels to Llanrwſt bridge; erected by Inigo Jones with a centre arch 60 feet wide (ſee CANAL); but receiving many tributary ſtreams in the courſe of 12 miles, it becomes ſufficiently deep to bear ſhips of conſiderable bulk, and is nearly a mile in breadth at high water, but not more than 150 feet at low water, and eight feet deep, at the ferry oppoſite the town of Conway, beyond which it flows into the Iriſh Sea. The ſpring-tides vary from 14 to 18 feet; conſequently veſſels of 400 tons burthen may approach cloſe to the town: nevertheleſs the ſhifting ſand-banks make the entrance of the port dangerous. The *mya margaritifera* of Linnæus, or pearl muſcle, made the river of importance previous to the Roman invaſion. Such was its celebrity, that Suetonius acknowledged the pearl-fiſhery of the Conway to have been one of his inducements for undertaking the ſubjugation of Wales. According to Pliny, the muſcles, called by the natives *kregindiliw*, were ſought for with avidity by the Romans, and the pearls found within them highly valued; in proof of which it is aſſerted, that Julius Cæſar dedicated a breaſt-plate, ſet with Britiſh pearls, to Venus Genetrix, and placed it in her temple at Rome. A fine ſpecimen from the Conway is ſaid to have been preſented to Catharine, conſort of Charles II., by ſir Richard Wynne of Guedir; and it is further ſaid, that it has ſince contributed to adorn the regal crown of England. Lady Newborough poſſeſſes a good collection of the Conway pearls, which ſhe purchaſed of thoſe who were fortunate enough to find them, as there is no regular fiſhery at preſent. The late ſir Robert Vaughan had obtained a ſufficient number to appear at court, with a button and loop to his hat, formed of theſe beautiful productions, about 28 years paſt.

CONWAY, or ABERCONWAY, an ancient town of Carnarvonſhire, North Wales, is ſeated on the river Conway, near its confluence with the Iriſh Sea. This place does not appear to have acquired any conſequence till the time of Hugh Lupus, earl of Cheſter, who fortified the mouth of the river about the year 1098; and it obtained more diſtinguiſhed importance during the reign of Edward I., who enlarged the fortifications, and erected a very ſtrong caſtle in 1284. The outline of this venerable and romantic place is triangular, and is ſtill ſurrounded with embattled walls. Theſe are erected in many places upon ſolid rocks, and are one mile and an half in circumference; they had four gates, and were defended by 24 baſtions; in addition to which, two curtains projected into the river, where they terminated with watch-towers: but theſe and one of the former have fallen. Edward I. evinced great ſkill in conſtructing the defenſive works of Conway, and particularly by erecting his ſuperb caſtle on the baſe of the triangle next the river, where nature had placed a vaſt perpendicular rock of ſlate. He thus protected England from the incurſions of the Welſh, who were commanded by Llewelyn; and afforded himſelf and ſucceſſors an impregnable poſt for collecting the means of invaſion, when an opportunity offered for entering Wales with any proſpect of ſucceſs. By this caſtle he had it in his power to occupy the neighbouring paſs of Penmaen-Mawr at pleaſure, and by that means to cut off all communication with the interior of the principality: and yet this fortreſs had once nearly coſt him his crown, in proceeding to it at the head of his army. On this occaſion, Edward incautiouſly croſſed the river Conway with a few attendants, and was ſeparated from the town by the flowing of the tide. At this critical moment the Welſh attacked the caſtle; but although the monarch and his little band of ſoldiers were deſtitute of every refreſhment, except honey and water, they had the bravery and addreſs to reſiſt their opponents, till the ebbing of the tide. Richard II. took refuge in this caſtle, on his return from Ireland in 1399, and was delivered into the power of his enemies from it, through the treachery of the duke of Northumberland. During the civil war, Charles I. particularly requeſted Williams, archbiſhop of York, to put the caſtle in a complete ſtate of defence, for his uſe; and pledged his honour that the cuſtody of it ſhould remain with the prelate, or any perſon he thought proper to appoint, till the ſum expended was repaid. When the repairs were accompliſhed, Williams placed the caſtle under the government of his nephew, William Hooker. The neighbouring gentry, conceiving it a ſecure depoſitory, ſent their moſt valuable writings and plate to the keeping of the archbiſhop and Hooker; the former giving his receipts, and making himſelf reſponſible in caſe of loſs. About a year afterwards, colonel ſir John Owen obtained the appointment of governor of Conway caſtle from prince Rupert, and, proceeding ſuddenly to the place, ejected the prelate and his adherents, who were poſitively denied permiſſion to remove the articles, for which receipts had been given. Greatly irritated at this unworthy conduct, Williams vainly applied to the court for redreſs. Yielding at length to the repreſentations of general Mytton, who commanded the parliament's army, he adopted their cauſe, and fortified his own houſe, which was garriſoned by Mytton's troops. A conflict ſoon afterwards occurred, in which the prelate was wounded in the neck. After the ravage of the civil wars, a grant was made of it to Edward, earl of Conway, who, in 1665, dilapidated the buildings. At preſent it is held by a private proprietor under the crown. A little hill is planted and laid out towards the mouth of the river, commanding a fine view of the town and caſtle on one ſide, and the ſea on the other, to which is given the claſſical name of Arcadia. The ruins are ſtill uncommonly magnificent, and bounded by the river, a creek, and the town. The walls are not greatly injured; and eight vaſt towers, ſurmounted by turrets, are yet ſtanding. In one of theſe is an oriel window, richly ornamented, where the toilet of queen Eleanor is ſaid to have ſtood, at the period when her lord made the caſtle the ſcene of his hoſpitality: another of the towers, undermined by the inhabitants of Conway, ſplit aſunder, and a vaſt fragment fell upon the beach, where it lies, a wonderful ſpecimen of ancient maſonry. The hall, erected over extenſive vaults, is lighted by ſix windows towards the country, and three on the oppoſite ſide. Six of the eight pointed arches of the roof are yet entire. The length of the hall is 139 feet, and the breadth 32. The caſtle is now held from the crown by O. Holland, eſq., who pays a rent of 6*s.* 8*d.*, and is bound to furniſh lord Hertford with a diſh of fiſh, whenever he paſſes through Conway. However commanding and beautiful the town appears without the walls, the contraſt within is melancholy in the extreme, where ruins and deſolation prevail in every direction. Edward I., when he paſſed a Chriſtmas here with his queen Eleanor and the whole court, erected the place into a free borough, and the mayor was conſtituted conſtable of the caſtle. The preſent government is compoſed of an alderman, recorder, coroner, water-bailiff, &c. Mr. Evans mentions, in his "Tour through North Wales," an old houſe ſituated in Caſtle-ſtreet, called the college, with a curious window, and ſeveral coats of arms of the Stanleys; and another of large dimenſions, named *Plas Mawr*, built in 1585, by Robert Wynne, eſq. of Guedir, which he ſuppoſes, from the inſcriptions on the front, to have been erected for charitable purpoſes, particularly as there are many rude badges within, (probably of contributors); and the ſupporters of the arms of Dudley, earl of Leiceſter, decorate the walls and ceiling. The only religious ſtructure in Conway was an abbey of Ciſtertian monks, founded by prince Llewelyn ap Jorwerth, in 1185, who was buried in the abbey church, where his body remained till the diſſolution of the monaſtery, when it was carried to Llanrwſt. Edward I, conceiving the monks improper inmates of his fortreſs, removed them to a new abbey, which he erected near Llanrwſt, but did not deprive them of their privileges and endowments. Their old church was then made parochial, and the preſentation granted to the abbot and convent, on condition they provided three chaplains, two of whom were to be Engliſhmen, and the third a Welſhman; one of the former received the title and office of vicar, and, after having been named by the convent, was to be preſented by the dioceſan. The church of the original foundation is ſituated in the centre of the town; but it is more remarkable for its remote antiquity, than any beauty in the form or decorations. Cynan ap Owen Gwynedd was buried in this church, 1220; and there are at preſent ſeveral modern monuments of the Wynne family: one of the inſcriptions within it records the interment of Nicholas Hooker of Conway, gentleman, in 1637, who is ſaid to have been the 41ſt child of his father, by his wife Alice, and the father himſelf of 27 children. The tithes of the church are veſted in three truſtees, for the benefit of the poor of the town, and three villages in the neighbourhood: indeed the want of trade and manufactories renders the lower claſſes truly wretched, many of whom obtain a miſerable ſubſiſtence by collecting and burning into *barilla*, on the beach, different ſpecies of *fuci* or ſea-wreck, which is ſold for trifling ſums to the purchaſers, who make a great profit on their labour. The inconſiderable trade now carried on conſiſts of copper, lead, calamine, and potatoes for exportation; but little or nothing is imported. As Conway has hitherto been the great thoroughfare to Ireland, the inhabitants derived much advantage from the paſſengers; but the new road through the Ogwyn mountains will ſoon rob them even of this ſupport. Hills of lime-ſtone abound near this town, and ſome lead and copper mines, having chert, or a ſpecies of black hornſtone for a matrix. In a black ſilicious mountain here maſſes of porous chert are found, which, on trial, are found as fit for making our mill-ſtones as thoſe imported from France. Mr. Richard Bowes, who made this diſcovery, and ſent ſpecimens of the ſtones to the Society of Arts, was rewarded by that patriotic body. See their Tranſactions, vol. xviii. p. 197. Situated 240 miles N.W. of London. Population in 1801 was 889; the number of houſes 182. Bingley's and Evans's Tour in North Wales.

Conway, a townſhip of America, in the province of New Brunſwick, Sudbury county, on the weſtern bank of St. John's river. It has the bay of Fundy on the ſouth; and at the weſternmoſt point of the townſhip there is a tolerably good harbour, called Muſquaſh Cove.—Alſo, a townſhip in the N.E. corner of Strafford county, New Hampſhire, on a bend in Saco river, incorporated in 1765, and containing 574 inhabitants. It was called "Pig-wacket," by the Indians.—Alſo, a thriving townſhip in Hampſhire county, Maſſachuſetts, incorporated in 1767, and containing

ing 2092 inhabitants. It lies 13 miles N.W. of Northampton, and 115 N.W. by W. of Boſton.

Conway, *Cape*, a point of land on the eaſt coaſt of New Holland, ſo called by captain Cook in 1770, and lying in S. lat. 26° 36′. W. long. 211° 28′; between which and cape Hilſborough is a bay, which the ſame navigator called *Repulſe bay*. Within this cape there lie two or three ſmall iſlands, which would ſerve to ſhelter that ſide of the bay from the ſoutherly and ſouth-eaſterly winds, that ſeem to prevail here as trade-winds. Among the many iſlands that lie upon this coaſt, called by Cook *Cumberland iſlands*, one is more remarkable than the reſt: it is of ſmall circuit, very high, and peaked, and lies E. by S., 10 miles from cape Conway, at the ſouth end of the paſſage. This paſſage is from three to ſeven miles wide, and eight or nine leagues in length, N. by W. $\frac{1}{2}$ W., S. by E. $\frac{1}{2}$ E. It is formed by the main on the weſt, and by the iſlands on the eaſt, one of which is at leaſt five leagues in length. The depth of water, in running through it, was from 20 to 25 fathoms, with good anchorage every where; and the whole paſſage may be conſidered as one ſafe harbour, excluſive of the ſmall bays and coves which abound on each ſide, where ſhips might lie as in a baſon. The land both upon the main and iſlands is high, and diverſified by hill and valley, wood and lawn, with a green and pleaſant appearance. This paſſage, being diſcovered on Whitſunday, was called *Whitſunday paſſage*.

CONYA, a river of South America, in Surinam, or Dutch Guiana.

CONYBEARE, John, in *Biography*, a celebrated Engliſh prelate, born in the neighbourhood of Exeter, and educated at the free-ſchool in that city, from whence he was admitted at Exeter college, Oxford, where he applied himſelf ſo diligently to his ſtudies, that, in 1710, when he was but 19 years of age, he was choſen probationary-fellow upon ſir William Petre's foundation. He obtained the ſeveral degrees with reputation, and was ordained prieſt in 1716. During the next year he officiated as curate at Fetcham in Surrey. Upon his return to Oxford, he became tutor to his own college, and gained much celebrity as a preacher. He was afterwards appointed by Dr. Gibſon, biſhop of London, to the ſituation of one of his majeſty's preachers at Whitehall. In the year 1724, lord chancellor Macclesfield preſented him with the rectory of St. Clements, Oxford; and in 1728, he took the degree of bachelor, and in the following year, that of doctor in divinity. In 1730, he was elected to the high and arduous office of maſter of Exeter college; and in a ſhort time he undertook, at the deſire of the biſhop of London, and publiſhed a very excellent anſwer to Tindal's "Chriſtianity as old as the Creation," under the title of "A Defence of revealed Religion againſt the Exceptions of a late Writer, &c." This was publiſhed in 1732; and before the end of that year he was raiſed to the office of dean of Chriſt-church. He now reſigned the headſhip of his college, and ſpeedily the rectory of St. Clements; and in 1734, he had the honour of entertaining, at his own apartments, the prince and princeſs of Orange, and of receiving the thanks of queen Caroline for his conduct on that occaſion. From this period, to the year 1750, Dr. Conybeare received no additional preferment: he was then appointed to the biſhopric of Briſtol, which, though it increaſed his dignity in church preferment, was no addition to his fortune. This high honour was followed by a long train of illneſs, which terminated his valuable life in the year 1755. The good prelate left behind him a truly eſtimable character: he fulfilled all the duties of life with honour to himſelf, and for the advantage of thoſe connected with or dependent upon him. Zealouſly attached to the church, of which he was a diſtinguiſhed member, he was, at the ſame time, candid and liberal towards proteſtant diſſenters, with ſome of whom he had been educated, and with others he maintained an occaſional but friendly correſpondence through life. Two years after his deceaſe, were publiſhed, for the benefit of his ſurviving relations, ſermons in two volumes, 8vo. The very numerous liſt of ſubſcribers who patronized this undertaking, ſhew in what high public eſtimation Dr. Conybeare was held by his contemporaries. Biog. Brit.

CONYZA, in *Botany*, (derivation uncertain.) Linn. Gen. 950. Schreb. 1286. Willd. 1480. Gært. 971. Juſſ. 180. Vent. 2. 511. Coniſe; Encyc.

Gen. Ch. *Common calyx* either imbricated, or in ſeveral nearly equal ranks. *Cor.* Florets of the diſk hermaphrodite, numerous, tubular, funnel-ſhaped; border five-cleft, patulous; florets of the circumference female, either apetalous or funnel-ſhaped, not compoſing a ray; border generally three-cleft. *Stam.* Filaments five, very ſhort, capillary; anthers united into a hollow cylinder. *Piſt.* in the *diſk*. Germ oblong; ſtyle filiform, length of the ſtamens; ſtigma two-cleft: in the circumference ſtyles and ſtigma more ſlender. *Seeds* oblong; down ſimple. *Recep.* naked, flat.

Eſſ. Ch. Seeds of the calyx imbricated, or in ſeveral nearly equal ranks. Florets of the circumference female, apetalous, or funnel-ſhaped, with a three-cleft border, not compoſing a ray. Down ſimple. Receptacle naked.

* *Leaves not decurrent.*

* *Herbaceous.*

1. C. *ſquarroſa*. Linn. Sp. Pl. 1. Mart. 1. Lam. 1. Willd. 1. Lam. Ill. Pl. 697. fig. 1. Gært. tab. 166. Eng. Bot. 1195. Flor. Dan. tab. 622. (C. major vulgaris; Bauh. Pin. 265. Tourn. 454. C. Matthioli, baccaris Monſpelenſium; Cluſ. Hiſt. 2. 21. Lob. ic. 574. Blackw. tab. 102.) Great fleabane, or Plowman's ſpikenard. "Leaves ovate-lanceolate, downy; ſtem corymbous; calyx-ſcales foliaceous, recurved, and prominent." *Root* biennial, branched, and fleſhy. Whole herb ſoft and downy, in flavour bitter, and ſomewhat aromatic. *Stem* two or three feet high, erect, angular, leafy, but little branched, many-flowered. *Leaves* alternate, ſomewhat crenate, upper ones often entire. *Flowers* yellowiſh; calyx egg-ſhaped; outer ſcales green, recurved; inner ones reddiſh, erect, ciliated. *Seeds* angular; down ſcabrous. *Receptacle* tubercled. A native of England, and other parts of Europe, on a dry calcareous ſoil. 2. C. *linifolia*. Linn. Sp. Pl. 2. Mart. 2. (Aſter dracunculoides; Lam. Aſter ſolidaginoides; Willd. Aſter americanus albus, mezerei arabum exaſperatis foliis; Pluk. alm. 56. tab. 79. fig. 2.) "Leaves linear-lanceolate, quite entire; corollas rayed." *Stems* a foot or a foot and half high, erect, hardiſh, green. *Leaves* reſembling thoſe of mezereon or hyſſop, only more obtuſe, ſmooth, and ſtiff. *Flowers* on ſhort terminal peduncles; florets white, ſlender, reflexed. Its radiate flower certainly excludes it from this genus; but as it is not inſerted in our work under Aſter, we have retained it here. A native of North America. 3. C. *ſcabra*. Linn. Mant. 113. Mart. 7. Willd. 2. "Leaves oblong; ſomewhat toothed, ſeſſile, ſcabrous; peduncles one-flowered, elongated." *Leaves* rugged on both ſurfaces, four or five teeth on each ſide. *Peduncles* axillary, at the top of the branches, becoming finally ſix times the length of the leaves. A native of the Eaſt Indies. 4. C. *ſymphytifolia*. Mart. 35. Houſton MSS. "Leaves oblong-egg-ſhaped, ſcabrous; flowers in terminal racemes." *Root* perennial. *Stem* three feet high. *Leaves* four or five inches long, one inch and a half broad in the middle, rough,

like thoſe of comfrey. *Flowers* yellow; on branched peduncles. Sent by Dr. Houſton to Miller from La Vera Cruz. 5. C. *folioloſa.* Willd. 3. "Leaves oblong, nearly entire, half embracing the ſtem, downy; peduncles one-flowered, finally much elongated." *Stem* much branched, diffuſe, downy; branches thick ſet with leaves. *Leaves* alternate, downy on both ſurfaces. A native of the Eaſt Indies. 6. C. *patula.* Mart. 30. Willd. 4. Hort. Kew. 3. 184. "Leaves elliptical, ſerrated, villous underneath; calyxes ſomewhat globular; ſcales lanceolate, awl-ſhaped; branches ſpreading." *Root* annual. *Stem* a foot and half high, taper, ſlightly covered with a mealy down. *Leaves* about four inches long, and two broad in the middle, diminiſhing gradually in ſize on the upper part of the ſtem and branches. *Flowers* purple; peduncles at the end of the branches generally three-flowered; calyxes ſoft and ſwollen in the middle; ſcales ſmall and acute. A native of the northern parts of China, producing a ſucceſſion of flowers from July to the end of autumn. 7. C. *paniculata.* Willd. 5. "Leaves oblong, ſeſſile, downy on both ſurfaces; lower ones petioled; toothed; teeth reflexed; ſtem panicled; corymbs peduncled, axillary." *Stem* four feet high, about the thickneſs of a ſwan's quill, erect, cylindrical, hollow, ſtriated; branches alternate, erect, ſimple. *Leaves* on the ſtem petioled, on the branches ſeſſile. *Calyx-ſcales* linear-awl-ſhaped, ſpreading, reflexed. A native of the Eaſt Indies. 8. C. *bifrons.* Linn. Sp. Pl. 7. Mart. 9. Willd. 6. (Eupatoria conyzoides maxima canadenſis; Pluk. alm. 141. tab. 87. fig. 4.) "Leaves ovate-oblong, embracing the ſtem, ſerrated, wrinkled." *Root* thick, fibrous. *Stems* ſeveral, erect. *Leaves* rough. *Flowers* yellow, in round terminal bunches. A native of Canada, flowering in July. Diſtinct from Inula bifrons. 9. C. *bifoliata.* Linn. Sp. Pl. 9. Mart. 10. Willd. 7. (Eupatoria conyzoides integro jacobææ folio; Pluk. alm. 140. tab. 177. fig. 1. C. axillaris; Lam.?) "Leaves oval, toothed; peduncles two-leaved; bractes oppoſite;" Linn. "Leaves cuſpidate-toothed; lower ones petioled, roundiſh egg-ſhaped; upper ones ſeſſile, oblong, wedge-ſhaped at the baſe; racemes axillary, leafy at the baſe, peduncled;" Willd. "Leaves inverſely egg-ſhaped, unequally and finely toothed, petioled; racemes axillary, leafy at the baſe, forming a terminal panicle;" Lam. *Stem* a foot and half or two feet high, ſimple, ſlightly ſtriated, downy. *Leaves* alternate, ſoft, green, and almoſt ſmooth above, cinereous and downy underneath. *Flowers* ſmall; bractes truly alternate, though ſome ſeem oppoſite; calyxes villous, reddiſh; Lam. Deſcribed from a dried ſpecimen in the Herbarium of Commerſon. In ſmaller ſpecimens, probably the growth of a poor ſoil, the peduncles are one-flowered, with oppoſite bractes. In larger ſpecimens the racemes are from three to ſix-flowered; peduncled, furniſhed with two, either oppoſite or alternate bractes, and ſometimes with four alternate ones; bractes oblong, ſeſſile, generally entire; Willd. A native of the Eaſt Indies and the Iſle of France. 12. C. *pubigera.* Linn. Mant. 113. Mart. 11. Lam. 9. Willd. 8. Lour. Cochinchin. 495. (Sonchus volubilis; Rumph. Amb. 5. 299. tab. 103. fig. 2.) "Leaves oblong, ſomewhat toothed, nearly ſeſſile; peduncles woolly, about two-flowered." *Branches* with a few ſcattered hairs. *Leaves* alternate, wedge-ſhaped at the baſe, green on both ſurfaces, with a few ſcattered hairs, not ſcabrous; Linn. *Stem* ſomewhat ſhrubby, eight feet high, cylindrical, climbing, branched. *Leaves* broad-lanceolate, ſomewhat pubeſcent, ſcattered, petioled. All the florets immerſed in a ſimple down; Lour. A native of the Eaſt Indies and China. 11. C. *ſtricta.* Willd. 13. "Leaves linear-lanceolate, attenuated at the baſe, quite entire, hairy; flowers in corymbs; ſtem panicled, ſtiff." *Root* annual. *Stem* a foot and half high, erect; branches ſhort, erect, cloſe to the ſtem. *Leaves* alternate, numerous, an inch long, obtuſe, with a point, narrowed at the baſe. *Corymbs* ſmall, faſtigiate at the tops of the branches. *Flowers* ſmall; down reddiſh. A native of the Eaſt Indies. 14. C. *caneſcens.* Linn. jun. Sup. 367. Mart. 5. Willd. 18. Thunb. prod. 153. (C. pinifolia; Lam. 18. Elichryſum peregrinum anguſtifolium floſculis ſpadiceis in apices crinitos deſinentibus; Seb. Muſ. 1. 38.) "Leaves linear, ſtiff, folded back at the edges; downy underneath; panicle faſtigiate." Whole plant hoary. *Stem* from twelve to fifteen inches high, nearly ſimple, cylindrical, ſtiff, lateral branches ſhort. *Leaves* three inches long, a line broad. *Flowers* purple; calyx ſhort; ſcales imbricated, lanceolate, villous, only half the length of the flowers; down intermixed with the florets; giving the flowers a feathered appearance. 15. C. *oleæfolia.* Lam. 20. Willd. 15. (C. orientalis pumila incana oleæfolio; Tourn. cor. 33.) "Leaves lanceolate, attenuated at the baſe, obtuſe, downy; corymb terminal; ſtem ſimple." *Root* perennial. *Stem* ſeven or eight inches high, erect. *Leaves* not an inch long, three or four lines broad, ſcattered. *Flowers* in a cloſe faſtigiate corymb; peduncles ſcaly; calyx oblong; ſcales cloſely imbricated, egg-ſhaped, obtuſe; down reddiſh, longer than the calyx. A native of America. 16. C. *viſcoſa.* Mart. 34. Houſt. MSS. "Leaves egg-ſhaped, ſerrated, villous; flowers axillary and terminal." *Root* annual. Whole herb viſcid. *Stem* a foot high, branched. *Leaves* one at each joint, ſeſſile. *Flowers* white; peduncles ſlender; generally three-flowered. *Seeds* chaffy. A native of La Vera Cruz. 17. C. *mollis.* Willd. 19. "Leaves rhomboid-egg-ſhaped, nearly ſeſſile, toothed, pubeſcent, tomentous underneath; ſtem naked upwards; flowers in a corymb." *Branches* cylindrical, ſtriated. *Leaves* an inch long, very white underneath. *Corymb* terminal; branches alternate, few-flowered, divaricated; peduncles one-flowered; calyx-ſcales linear-lanceolate; down long, ſnow-white. 18. C. *chenopodifolia.* Lam. 12. Willd 20. "Leaves ovate-deltoid, unequally ſerrated, ſoft; racemes ſhort, terminating the ſtem and branches." *Stem* tomentous upwards. *Leaves* alternate, petioled, tomentous when young, afterwards nearly ſmooth. *Flowers* whitiſh, ſeſſile, four or five together at the top of the ſtem and branches; calyx-leaves linear, very narrow, tomentous, almoſt equal; bractes cloathed with fine ſilky decumbent hairs. A native of the Iſle of Bourbon. There is a variety with broader, roundiſh-egg-ſhaped leaves, a little cut at the baſe. 19. C. *cinerea.* Linn. Sp. Pl. 14. Mart. 16. Lam. 3. Willd. 21. (Senecio indica, foliis ternis crenatis; Burm. Zeyl. 211. tab. 96. fig. 1. S. indicus atriplicis folio; Mor. Hiſt. 106. tab. 17. fig. 7. Olus ſcrophinum; Rumph. 6. tab. 14. fig. 1.) "Leaves egg-ſhaped, ſlightly crenate; lower ones obtuſe, upper ones acute; panicles naked, terminal;" Lam. *Root* annual. *Stem* about a foot high, ſlender, pubeſcent. *Leaves* ſmall, rather diſtant, narrowed into a petiole, cinereous-green, whitiſh underneath. *Flowers* purple, ſmall; peduncles branched, almoſt capillary; calyx-ſcales acute; down white, longer than the calyx. A native of the Eaſt Indies. 20. C. *prolifera.* Lam. 7. Willd. 22. (Sonchus volubilis Javanus; Rumph. 5. 299. tab. 104. 1?) "Branches proliferous at the top; leaves egg-ſhaped, toothed-angular, narrowed into a petiole; corymbs cloſe, terminal." *Branches* finely ſtriated, full of pith, ſcabrous, producing near the top ſome ſmaller villous branches, and giving the plant a proliferous appearance. *Leaves* ſmall, acute, green, and almoſt ſmooth above, hoary, and cloathed with ſhort hairs underneath. *Corymb* almoſt ſeſſile; calyx-ſcales awl-ſhaped, down white, the length of the calyx. A native of the iſland of Java. 21. C. *heterophylla.* Lam. 8. "Some of the leaves a little heart-ſhaped;

others rounder; flowers panicled." *Stem* about a foot and half high, branched, finely ſtriated, cloathed with very ſhort hairs. *Leaves* rather ſmall, petioled, cinereous underneath. *Flowers* ſmall; calyx-ſcales acute, purpliſh at the tip; down white, a little longer than the calyx. A native of the Eaſt Indies. 22. C. *lacera.* Lam. 5. Burm. Ind. 180. tab. 59. fig. 1. "Leaves ſomewhat lyrate, appearing torn, downy; flowers nodding." *Stem* about a foot and half high, ſimple, cylindrical, cottony. *Leaves* alternate, obtuſe; lower ones petioled. *Flowers* in a ſmall terminal panicle or raceme; peduncles axillary, very ſhort, often in pairs; calyxes villous; ſcales imbricated, very narrow, awl-ſhaped; down whitiſh, not longer than the calyx. A native of Java. 23. C. *hirſuta.* Linn. Sp. Pl. 19. Mart. 19. Willd. 24. Burm. Ind. 180. Lour. Cochinchin. 495. "Leaves oval, quite entire, ſcabrous, hirſute underneath." *Stem* a foot high, upright, ſimple, cylindrical, hairy. *Leaves* ſcattered, ſomewhat acute, ſometimes edged with very minute teeth. *Flowers* yellow, crowded, terminal; calyx ſhort, hairy. A native of Java, China, and Cochinchina. 24. C. *pauciflora.* Willd. 25. "Leaves lanceolate-obovate, attenuated above and below, ſmooth, ſcabrous underneath, ſerrated; branches one-flowered." *Root* annual. *Stem* from half a foot to a foot and half high, erect, ſtriated, a little branched towards the top. *Leaves* an inch and half long, green. *Flowers* large, ſolitary, terminating the branches; calyx-ſcales awl-ſhaped; down ſcabrous. A native of Africa, about the river Senegal. 25. C. *ægyptiaca.* Mart. 27. Willd. 26. Hort. Kew. 3. 183. (Erigeron ægyptiacum; Linn. Mant. 112. E. ſerratum. Forſk. ægyp. 148. C. capitata ſive globoſa; Bocc. Sic. 13. tab. 7. fig. B. Moriſ. hiſt. 3. 114. tab. 20. fig. 14. Jacobæa ægyp. fol. glauco coronopi; Boerh. lugdb. 99.) "Leaves oblong-ſpatulate, toothed, hairy; flowers in ſomewhat globular panicles; calyx-ſcales awl-ſhaped, ſoft." *Root* annual. *Stem* a foot and half high, erect, ſomewhat ſtriated, green, pubeſcent, a little viſcid. *Leaves* alternate, ſeſſile, ſcarcely half embracing the ſtem, rather obtuſe. *Flowers* yellow, terminal, four or five together, on purpliſh peduncles; calyx roundiſh; ſcales awl-ſhaped; florets minute; thoſe of the circumference numerous; piſtils yellow, quickly vaniſhing, ſurrounding the diſk with a broad downy ring. A native of Sicily and Egypt. 26. C. *Gouani.* Linn. Mant. 469. Willd. 27. (Erigeron Gouani; Jacq. Hort. 3. 43. tab. 79.) "Leaves lanceolate, ſerrated near the top, ſcabrous at the edges; lower ones inverſely egg-ſhaped; flowers cluſtered; calyx-ſcales lanceolate, membranous at the margin." *Stem* a foot high, ſimple, with a few erect hairs. *Leaves* alternate, half embracing the ſtem, even-ſurfaced. *Flowers* panicled; calyx roundiſh, imbricated; ſcales ſmooth, convex, cloſe; florets of the circumference apetalous, more numerous than thoſe of the diſk; ſtigma bifid, oblong. A native of the Canary Iſlands. 27. C. *ſenegalenſis.* Willd. 28. "Leaves oblong, inverſely egg-ſhaped, toothed; teeth near the baſe; deeper flowers in ſomewhat of a cloſe corymb." *Stem* ſtriated, hairy, hiſpid. *Leaves* ſeſſile, ſcabrous on both ſurfaces with callous points; lower ones an inch long. *Flowers* at the top of the ſtem; calyx-ſcales linear-lanceolate, ſcabrous. A native of Africa, about the river Senegal. 28. C. *dentata.* Willd. 29. "Leaves lanceolate, embracing the ſtem, dilated at the baſe, pubeſcent, toothed; branchlets one-flowered; peduncles elongated; ſtem hairy." *Stem* cylindrical, branched. *Leaves* an inch long. *Flowers* on long peduncles; calyx-ſcales linear-awl-ſhaped, ſcabrous; lower ones ciliated. A native of Africa about the river Senegal. 29. C. *villoſa.* Willd. 30. "Leaves lanceolate, embracing the ſtem, dilated at the baſe, villous, ſerrated; branchlets one-flowered; ſtem villous." But little different from the preceding. 30. C. *aurita.* Linn. jun. Sup. 367. Mart 24. Lam. 17. Willd. 31. "Leaves toothed; root-ones ſmoothiſh, inverſely egg-ſhaped; ſtem ones oblong, pubeſcent, ſomewhat pinnatifid at the baſe; ſtem panicled; calyx-ſcales awl-ſhaped; outer ones hairy." *Root* annual. *Stem* a foot high, erect, red, hairy; branches erect, ſimple. *Root-leaves* marked with red veins, widely ſerrated, and crenated between the ſerratures; ſtem-leaves ſomewhat lanceolate, ſoft; ſerrated near the top; ſinuated in the middle; ſomewhat pinnated at the bottom; ſerrate-toothed along the whole margin; pinnæ two or three on each ſide, ſpreading. *Flowers* white, ſmall; thoſe of the circumference linear; piſtils longer, erect. A native of the Eaſt Indies. 31. C. *guineenſis.* Willd. 32. "Leaves toothed; root-ones ſcabrous, inverſely egg-ſhaped; thoſe of the ſtem lanceolate, villous, ſomewhat pinnatifid at the baſe; ſtem panicled; flowers in corymbs; calyx-ſcales lanceolate; outer ones villous." *Root* annual. *Stem* a foot and half or two feet high, erect, villous. *Root-leaves* an inch and half or two inches long, obtuſe, remotely ſerrated; lower ſtem-leaves inverſely egg-ſhaped, an inch long, widely-toothed, deeply auriculate-toothed at the baſe; thoſe of the branches half an inch long, lanceolate, villous, toothed, ſomewhat pinnatifid at the baſe; teeth profound; teeth of the baſe quite entire, not ſerrated as in the preceding. *Flowers* in a terminal corymb; calyx-ſcales lanceolate, acute; outer ones ſhorter, villous. Nearly allied to the preceding, but differs in the form of the calyx, and the teeth of the lower leaves. A native of Guinea. 32. C. *amplecicaulis.* Lam. 10. Willd. 35. "Leaves lanceolate, nearly embracing the ſtem, ſomewhat toothed, hairy; ſtem branched, divaricated; peduncles one-flowered." *Root* annual. *Stem* from half a foot to a foot high. *Root-leaves* inverſely egg-ſhaped, toothed; thoſe of the ſtem oblong or lanceolate, remotely toothed, almoſt entire towards the top of the branches. *Flowers* reſembling thoſe of C. aurita; peduncles axillary, ſolitary, an inch or an inch and half long. A native of the Eaſt Indies. 33. C. *obliqua.* Willd. 34. (Erigeron obliquum; Linn. Mant. 572.) "Leaves egg-ſhaped, nearly embracing the ſtem, finely toothed, oblique; ſtem much branched: peduncles one-flowered." *Root* annual. *Stem* three inches long, erect, cylindrical, hairy. *Leaves* alternate, veined, not wrinkled, fragil, beſet with a few ſcattered hairs. *Flowers* yellow, ſolitary, numerous; calyx cylindrical, pubeſcent; ſcales numerous, equal, awl-ſhaped, approximate; florets of the circumference ſcarcely conſpicuous, numerous; ſtigmas of the diſk erect, of the circumference ſpreading. A native of the Eaſt Indies. 34. C. *orientalis.* Willd. 35. (C. orientalis Aſteris attici folio; Tourn. Cor. 35.) "Leaves ſcabrous, ſerrated; lower ones inverſely egg-ſhaped, petioled; upper ones lanceolate, ſeſſile; flowers terminal, cluſtered." *Root* perennial. *Stem* cylindrical, ſtriated, hiſpid-ſcabrous, branched at the upper part; branches ſhort, ſimple. *Flowers* yellow, crowded, in a ſort of corymb at the top of the ſtem and branches; calyx-ſcales awl-ſhaped. A native of Armenia. 35. C. *ſicula.* Willd. 36. (Erigeron ſiculum; Linn. C. ſicula annua, foliis atro-virentibus; Boc. Sic. 62. tab. 31. fig. 4. Moriſ. hiſt. 3. 115. tab. 20. fig. 28. Pluk. phyt. 168. fig. 2.) "Leaves linear-lanceolate, ſcabrous, nearly entire, revolute at the edges; ſtem panicled; peduncles one-flowered, leafy; lower calyx-ſcales lax." *Root* annual. *Stems* red. *Flowers* ſmall; peduncles covered with minute linear, recurved leaves. In other reſpects reſembling erigeron graveolens, but without a ray. Allied alſo to inula pulicaris. A native of Sicily and the ſouth of France. 36. C. *fœtida.* Willd. 37. (Erigeron fœtidum. Linn. Senecio africanus perennis; Pluk. alm. 343. tab. 223. fig. 3.) "Leaves linear, attenuated at the baſe, mucronate; corymbs peduncled, cloſe, terminal." *Root* perennial, too nearly allied to inula fœtida, but has no ray. A native of Africa. 37. C. *pungens.* Lam. 21. Willd 38. (C. memphitica; Vaill. act. 1719. p. 501.) "Leaves tricuſpidate, awl ſhaped, pungent; ſtem panicled, angular, ſmooth." *Stem* a foot high, branched. *Leaves* alternate, diſtant; two lateral ſegments very ſhort. *Flowers* yellow, large, ſolitary, terminal; calyx top-ſhaped or oblong, imbricated; ſcales egg-ſhaped, ſmooth; inner ones mucronate; down reddiſh, the length of the calyx. A native of Egypt, about Grand Cairo.

* * *Stems ſhrubby.*

38. C. *ſaxatilis.* Linn. Sp. Pl. 3. Mart. 4. Lam. 23. Willd. 40. (Helichryſo ſylveſtri ſimilis; Bauh. Prod. 123. Elichryſum ſylveſtre latifolium; Tourn. 452. Helichryſum capitulis ſingularibus brevibus; Mor. hiſt. 3. [illegible] . H[illegible]he; Bocc. Muſ. 142. tab. 104. Chry[illegible] major; Barrel. Ic. 425.) "Leaves [illegible] ſomewhat toothed; peduncles very long, one-flowered." *Root* perennial. *Stems* about a foot high, ſlender, branched, cottony, a little procumbent when young. *Leaves* an inch and half long, two lines broad, green above, whitiſh underneath. *Flowers* yellow, ſolitary, on long peduncles; calyx-ſcales oblong, ſomewhat ſcarious at the tip, lax. A native of Spain, Italy, the South of France, Paleſtine, &c. 39. C. *rupeſtris.* Linn. Mant. 113. Mart. 6. Willd. 41. (C. ſaxatilis β. Lam. C. tomentoſa; Forſk. Ægyp. 75.) "Leaves ſpatulate, ſomewhat toothed, downy; peduncles elongated, one-flowered." Very like the preceding, but the flowering ſtems have axillary branches of ſmaller leaves. *Leaves* broader, ſhorter, more obtuſe, all except the lowermoſt white on both ſides. *Flowers* yellow; peduncles ſhorter and thicker, with one or two lanceolate, not briſtle-ſhaped, bractes; calyx ſcales not acute and patulous, but rather obtuſe and cloſely imbricated; outer ones egg-ſhaped, brown at the tip; middle ones linear, obtuſe, with a brown line on the back. A native of Arabia. 40. C. *ſordida.* Linn. Mant. 466. Mart. 3. Lam. 22. Willd. 39. (Gnaphalium ſordidum; Linn. Sp. Pl. Elichryſum ſylveſtre anguſtifolium, capitulis conglobatis; Bauh. Pin. 264. Stæchus citrina ſpuria, longioribus foliis; Bar. Ic. 368. & 277.) "Leaves linear, quite entire; peduncles long, three-flowered." Nearly allied to C. ſaxatilis. *Stem* reſembling that of lavender, about a foot high, ſlender, cottony. *Leaves* very narrow, ſoft, cottony, whitiſh. *Flowers* ſmall; peduncles long, ſlender, cottony; calyxes conic; ſcales imbricated, a little ſcarious at the tip. A native of the South of France and Italy. 41. C. *ericoides.* Lam. 51. Willd. 43. "Leaves linear, revolute, downy underneath; flowers globular, ſolitary, terminating the branches." *Stem* much branched; branches downy near the top. *Leaves* reſembling thoſe of phylica ericoides, ſmall, numerous, approximate, ſcattered, ſpreading. *Flowers* at the top of the lateral branches, which are ſo diſpoſed as to give the ſtems the appearance of being covered with flowers; calyx-ſcales linear, ſcarcely imbricated; outer ones downy on the back; down reddiſh. A native of Peru. 42. C. *thyoides.* Lam. 42. Illus. Pl. 697. fig. 5. Willd. 44. "Leaves embracing the ſtem, egg-ſhaped, acute, keeled, compreſſed, imbricated in two rows; flowers ſolitary, ſeſſile, lateral." A very ſingular plant in the form and diſpoſition of its leaves, with ſomewhat of the habit of a Thuia. *Stem* a foot and half high, cylindrical, cottony towards the ſummit; branches in two rows, gradually diminiſhing in length from the bottom of the ſtem to the top. *Leaves* ſmall, numerous, concave, villous on the inſide. *Flowers* axillary; calyx-ſcales few, oblong, ſmooth and even; down reddiſh. A native of Peru, found by Joſeph Juſſieu. 43. C. *cupreſſiformis.* Lam. 43. Ill. Pl. 697. fig. 3. Willd. 45. "Whole plant ſmooth; leaves minute, inverſely egg-ſhaped, keeled, imbricated in four rows; flowers ſolitary, terminal." A plant as ſingular as the preceding, with the habit and foliage of a cypreſs, and the flowers of an Athanaſia. *Stem* rather thick, ſtiff, ſlender branched. *Leaves* thickly covering the branches. *Flowers* yellow, ſolitary, ſeſſile; calyx cylindrical; ſcales imbricated, obtuſe, inner ones the longeſt. Found by Commerſon in the Straits of Magellan. 44. C. *lycopoides.* Lam. 44. Ill. Pl. 697. fig. 2. Willd. 46. "Leaves awl-ſhaped, imbricated, preſſed cloſe to the branches; flowers ſolitary, terminal." A ſhrub ſix or ſeven inches high. *Stem* ſtiff; branches erect, generally faſciculated ſo as to reſemble lycopodium ſelago. *Leaves* three lines long, ſmooth, convex at the back, with two lateral furrows. *Flowers* white or lemon-coloured, ſeſſile; calyx-ſcales imbricated, ſimilar to the leaves but ſmaller; down white, twiſted and appearing curled. Found by Commerſon in the Iſle of Bourbon. 45. C. *bryoides.* Lam. 45. Willd. 47. "Proſtrate; leaves linear, crowded, hoary underneath; branchlets terminated with a ſeſſile flower." A ſmall ſhrub. *Stem* divided into numerous, ſhort, procumbent branches, throwing out fibrous roots; branches erect, in cloſe tufts ſomewhat in the manner of a Bryum. *Leaves* ſmall, numerous, placed very near each other, green above, whitiſh and cottony underneath. *Flowers* yellow, ſolitary; calyx almoſt cylindrical, containing from ſix to eight florets; ſcales imbricated, oblong; down the length of the calyx. Found by Commerſon in the Straits of Magellan. 46. C. *linearifolia.* Lam. 49. Willd. 48. "Smooth; leaves linear, nearly entire, narrowed towards the baſe; racemes ſhort, leafy, terminal." A ſmall much-branched ſhrub; branches ſlender, leafy towards the top, ſlightly ſtriated. *Leaves* an inch long, two lines broad. *Flowers* ſeſſile or nearly ſo; calyx oblong, imbricated; inner ſcales linear-lanceolate, white and ſcarious at the edges; down reddiſh, the length of the calyx. A native of the Iſle of Bourbon. 47. C. *punctata.* Willd. 49. "Leaves linear, acuminate, attenuated at the baſe, ſlightly marked with concave dots; peduncles very long, one-flowered." *Branches* cylindrical, ſtriated, ſmooth. *Leaves* an inch and half long, alternate, crowded, ſomewhat fleſhy, rather ſcabrous, quite entire and ſcabrous at the edges. *Peduncles* at leaſt half a foot long, ſolitary or in pairs, beſet with awl-ſhaped diſtant ſcales; calyx-ſcales lanceolate, acute; down reddiſh. A native of Chili. 48. C. *canarienſis.* Willd. 50. "Leaves linear, attenuated at the baſe, rather obtuſe, ſerrated; corymbus terminal." *Branches* cylindrical; younger ones pubeſcent. *Leaves* alternate, crowded, ſpreading, green on both ſurfaces, ſomewhat ſcabrous. *Flowers* yellow; peduncles ſcaly; calyx-ſcales oblong, cloſely imbricated. A native of the Canaries. 49. C. *incana.* Willd. 51. (Erigeron incanum; Vahl. Symb. 1. 72.) "Leaves linear, attenuated at the baſe, ſomewhat toothed, downy; corymbus terminal." *Branches* downy. *Leaves* ſeſſile, approximate, rather acute, a little revolute at the margin. *Corymbs* many-flowered; calyx-ſcales linear, ſomewhat villous; down ferruginous, longer than the calyx. A native of Arabia Felix. 50. C. *inuloides.* Mart. 25. Willd. 52. Hort. Kew. 3. 182. (Chryſocoma dichotoma; Linn. jun. Supp. 359. Jacq. Ic. Rar. 1. tab. 171.) "Leaves wedge-ſhaped-linear, obtuſe, crenate-toothed, ſmooth; anthers two-briſtled." *Stem* ſmooth, proliferous, dichotomouſly branched. *Leaves* rather ſhort, a little obtuſe, ſomewhat ſcabrous, with minute points.

Flowers yellow, in terminal ſimple corymbs; peduncles hirſute; bractes awl-ſhaped; calyx purpliſh. A native of rocky ground in the iſland of Teneriſſe. 51. C. *tomentoſa.* Mart. 31. Mill. Dict. Houſt. MSS. "Leaves oblong-egg-ſhaped, downy, cinereous underneath, flowers terminal, on branching peduncles." *Stem* ten or twelve feet high, much branched. *Leaves* alternate, on ſhort petioles. *Flowers* white, in looſe unilateral ſpikes. A native of La Vera Cruz in New Spain. 52. C. *chryſocomoides.* Willd. 53. Desfont. Atl. 2. 269. tab. 232. "Leaves linear, quite entire, villous; hairs preſſed cloſe; peduncles leafy, one-flowered." Whole plant cinereous-green, cloathed with ſhort ſoft hairs preſſed cloſe to the ſurface. *Stems* a foot and half high, ſlender, branched. *Leaves* ſpreading. *Flowers* in looſe panicles, on filiform peduncles; calyx ovate-cylindrical, ſcales linear, awl-ſhaped, imbricated, pubeſcent, membranous at the edges; florets of the circumference very ſmall, ſcarcely conſpicuous, without teeth. A native of Barbary. 53. C. *coronopus.* Lam. 35. Willd. 54. "Viſcid leaves linear-lanceolate, ſerrated ſerratures oblong, turned upwards; flowers globular in terminal corymbs." 54. C. *glutinoſa.* Lam. 32. "Leaves lanceolate, ſerrated, green on both ſurfaces; viſcid when young." A ſhrub four or five feet high, ſmooth. *Branches* lax, cylindrical, ſlightly ſtriated, leafy towards the ſummit. *Leaves* ever-green, petioled, acute, ſhining. *Flowers* yellow, numerous, ſmall, in a compound terminal corymb; calyx roundiſh, imbricated with egg-ſhaped ſcales; florets of the circumference very ſmall; down white, ſhort. A native of the Iſle of France. 55. C. *appendiculata.* Lam. 31. Willd. 66. "Leaves lanceolate, ſerrated, downy underneath, appendicled at the baſe." *Branches* tubercled, cottony towards the ſummit. *Leaves* near four inches long, about an inch broad, green above, cottony and whitiſh underneath, furniſhed at the baſe with ſome narrow appendages which are decurrent along the petiole. *Flowers* yellow, numerous, in a compound terminal corymb; peduncles and calyx cottony; bractes at the diviſions of the peduncles linear. Found by Commerſon in the Iſle of Bourbon. 56. C. *ſalicifolia.* Mart. 32. Lam. 33. Willd. 55. "Leaves linear-lanceolate, quite entire, revolute at the edges, attenuated upwards and downwards, downy underneath, corymb terminal, compound." *Branches* cylindrical, tubercled; younger ones downy. *Leaves* reſembling thoſe of Salix viminalis, two inches long, alternate, petioled. *Corymb* divaricated; peduncles downy; calyxes cylindrical, imbricated; outer ſcales egg-ſhaped, pubeſcent; inner ones longer, linear, ſmooth. There is a variety with very narrow, almoſt filiform leaves. 57. C. *laurifolia.* Lam. 34. Willd. 56. "Leaves oblong-lanceolate, narrowed at the baſe into a petiole, nearly entire; corymb terminal, compound, ſpreading." A very large ſhrub. *Branches* cylindrical, almoſt ſmooth, leafy on their upper part. *Leaves* about ſix inches long, rather more than an inch broad, ſcattered, ſlightly pubeſcent, ſometimes ſlightly crenulate. *Flowers* numerous, globular; peduncles cloathed with ſhort, woolly hairs; calyx-ſcales ovate-lanceolate, almoſt ſmooth; down reddiſh. Found by Commerſon in the Iſle of Bourbon. It ſeems to have ſome affinity with Baccharis arborea of Linnæus. There is a variety with ſmooth leaves broader at the top, ſmaller flowers and longer down, which perhaps may prove a diſtinct ſpecies. 58. C. *uniflora.* Mart. 38. Mill. Houſt. MSS. "Leaves lanceolate, acute, ſeſſile; flowers ſolitary, lateral, calyxes coloured." *Stem* eight or ten feet high, with numerous, long, ſlender branches. *Leaves* three inches long, three quarters of an inch broad in the middle. *Leaves* growing cloſe to the ſtems of the ſmaller branches. *Flowers* white, with a purple calyx, ſitting cloſe to the baſe of the leaves, one at each joint of the branch. A native of Carthagena in New Spain. 59. C. *purpuraſcens.* Mart. 42. Willd. 9. Swartz. prod. 112. (C. odorata minor: Brown. Jam. 318. C. major odorata; Sloan. Hiſt. 1. 258. tab. 158. fig. 1.) "Leaves ovate-lanceolate, ſerrated, ſomewhat downy; ſtem ſomewhat herbaceous, ſimple below, corymbous above; flowers egg-ſhaped." *Stem* four or five feet high (ſixteen or twenty inches; Brown.) *Leaves* on the ſtem and lower branches four inches long, one inch broad in the middle, on ſhort petioles; on the upper branches much narrower, acute. *Flowers* purple, in round terminal bunches. A native of Jamaica. 60. C. *trinervis.* Mart. 37. Lam. 13. Willd. 10. "Leaves egg-ſhaped, ſmooth, three-nerved, quite entire, ſeſſile; flowers in terminal ſpikes; ſtem ſhrubby." Mill. "Leaves ovate-lanceolate, quite entire, ſmooth, three-nerved; ſtem-leaves alternate, thoſe of the branches nearly oppoſite." Lam. *Stem* ſix or ſeven feet high, dividing into ſeveral woody branches. *Flowers* white. Sent by Robert Millar from Carthagena in New Spain. Miller. *Stem* ſmooth, leafy, full of pith, with numerous lateral and axillary branches. *Leaves* acute, on very ſhort petioles. *Flowers* in a naked, moderate ſized, panicle at the ſummit of the ſtem and branches; calyx ſmooth, imbricated with egg-ſhaped ſcales; down reddiſh, longer than the calyx. Found by Commerſon in Brazil. It perhaps may be doubted whether Millar's be the ſame plant. 61. C. *ſerrulata.* Lam. 14. Willd. 11. "Leaves ovate-lanceolate, broader at the baſe, acutely ſerrated, petioled, nearly ſmooth; corymbs branched, terminal." *Stem* two or three feet high, hard, full of pith, cylindrical, almoſt ſmooth, branched. *Leaves* alternate, acute, three-nerved. *Calyx* ſmooth, imbricated; down reddiſh. A native of Brazil. 62. C. *madagaſcarienſis.* Lam. 15. Willd. 12. "Leaves lanceolate-linear, diſtantly ſerrated, ſmooth; panicle cymous, lax, terminal." *Leaves* three or four inches long, four or five lines broad, erect, quite ſmooth, on ſhort petioles. *Flowers* ſmall; calyx ſhort, ſmooth, imbricated; down reddiſh. A native of Madagaſcar. 63. C. *candida.* Linn. Sp. Pl. 12. Mart. 13. Lam. 19. Willd. 16. (C. cretica fruticoſa, folio molli candidiſſimo; Tourn. Cor. 33. C. ſaxatilis folio filaginis; Buxb. Cent. 2. 23. tab. 17. Jacobæa cretica Incana; Barr. Ic. 217.) "Leaves egg-ſhaped, downy; flowers crowded; peduncles lateral and terminal." Whole plant white and cottony. *Stem* ſomewhat ſhrubby, ſix inches high or more, rather ſlender, erect, cylindrical. *Leaves* on long petioles, entire, ſoft. *Flowers* purple; peduncles one, two, or three-flowered; bractes oblong, ſeſſile, ſituated juſt below the calyx; calyx ſhort, imbricated; ſcales oblong, lanceolate, lax. A native of the iſland of Candia. Linnæus mentions a rayed variety. 64. C. *verbaſcifolia.* Willd. 17. (C. verbaſci foliis ſerratis; Tourn. Inſt. 455. After tomentoſus luteus verbaſci folio; Bocc. Sic. 60. tab. 31. fig. 2. After raguſinus; Zann. Hiſt. 33.) "Leaves egg-ſhaped, petioled, crenate, obtuſe, downy, wrinkled with veins; peduncles one-flowered, ſolitary, terminal and axillary, thickened upwards." *Stems* like thoſe of C. candida. *Leaves* an inch, or an inch and half long, on long petioles. *Flowers* yellow. In other reſpects ſimilar to the preceding. A native of Sicily, Greece, and Armenia. 65. C. *balſamifera.* Linn. Sp. Pl. 13. Mart. 15. Lam. 11. Willd. 18. (C. odorata; Rumph. Amb. 6. tab. 24. fig. 1.) "Leaves oblong-lanceolate, doubly toothed, acute, downy underneath, wrinkled with veins; petioles toothed; corymb terminal, divaricated." *Stem* from four to ſix feet high, branched. *Leaves* large, profoundly toothed at the baſe, where they appear pinnatifid,

tifid, very ſoft; upper ones entire. *Flowers* in terminal panicled racemes; peduncles and calyx cloathed with a fine, whitiſh cottony down; calyx-ſcales narrow, awl-ſhaped; down reddiſh, longer than the calyx. A native of the Eaſt Indies. It has an aromatic ſmell, reſembling that of ſage. 66. C. *chinenſis*. Linn Sp. Pl. 16. Mart. 18. Lam. 4. Willd. 23. Lour. Cochin. 496. Burm. Ind. 179. (Senecio amboinicus; Rumph. Amb. 6. 36. tab. 14. fig. 2.) "Leaves lanceolate-egg-ſhaped, reflex-ſerrated, downy underneath; flowers terminal, cluſtered." *Stem* ſomewhat ſhrubby, four feet high, erect, cylindrical, ſmooth, [illegible] at the top. *Leaves* hardiſh, petioled, alternate. [illegible]llow, peduncled, terminal. *Receptacle* ſomewhat [illegible]ur. *Flowers* ſeldom more than three together. Linn. The plant deſcribed by La Marck, which is cultivated in the Paris garden, has a ſtem only a foot high, and blueiſh purple flowers. In other reſpects it correſponds with the above deſcription. 67. C. *corymboſa*. Mart. 33. Mill. Houſt. MSS. "Arboreſcent; leaves lanceolate; flowers in terminal corymbs, on branching peduncles." *Stem* fourteen or ſixteen feet high, divided at the top into many woody branches. *Leaves* alternate, on ſhort petioles. *Flowers* white. Sent by Dr. Houſton from La Vera Cruz in New Spain. 68. C. *baccharis*. Mart. 41. "Leaves ovate-oblong, obtuſe, ſerrated, half embracing the ſtem; flowers in terminal corymbs." *Stem* ten or twelve feet high, ſending out many ſtrong woody branches. *Flowers* purple. A native of Campeachy. 69. C. *tortuoſa*. Linn. Hort. Clif. 405. Mart. 12. Willd. 57. "Stem crooked; leaves ovate-oblong, quite entire; racemes reflexed." *Branches* ſomewhat hirſute, ſtriated, ſimple. *Leaves* veined, ſcabrous on both ſurfaces, on very ſhort petioles. *Flowers* in ſimple, ſhort, terminal, and axillary racemes, alternate, ſeſſile, turned upwards; calyx roundiſh, imbricated; ſcales egg-ſhaped, inner ones lanceolate; down ſetaceous, faſtigiate. A native of La Vera Cruz. 70. C. *ſcandens*. Mart. 36. Mill. Houſt. MSS. "Leaves lanceolate, ſcabrous, nerved, ſeſſile; racemes recurved; flowers aſcending; peduncles lateral; ſtem climbing." *Stem* fourteen or ſixteen feet high, much-branched. *Leaves* the ſize of thoſe of the bay tree, and full as thick in their texture. *Flowers* white, in long unilateral racemes. A native of La Vera Cruz. 71. C. *rigida*. Mart. 43. Willd. 58. Swartz. Prod. 113. "Leaves petioled, inverſely egg-ſhaped, entire, ſcabrous, veined underneath; ſpikes zig-zag; flowers unilateral, in pairs." A native of Jamaica. 72. C. *amygdalina*. Lam. 38. "Leaves petioled, ovate-lanceolate, ſerrated, ſomewhat downy; flowers in a terminal corymb." *Leaves* reſembling thoſe of the almond-tree, much veined underneath. *Calyx* almoſt ſmooth, ſhort, imbricated; ſcales lanceolate, a little ſcarious at the edges; down reddiſh. Found by Commerſon in the Iſle of Bourbon. There is a variety with nearly ſeſſile leaves, cloathed on both ſurfaces with a whitiſh almoſt ſilky down. 73. C. *pedunculata*. Mart. 40. "Leaves ovate-lanceolate, three-nerved; peduncles very long, terminal; flowers in a corymb." *Stem* ſix or ſeven feet high, branched. *Leaves* ſmooth, alternate, on ſhort petioles. *Flowers* purple; calyx-ſcales ſhort, chaffy. A native of Campeachy. 74. C. *melaſtomoides*. Lam. 40. "Leaves egg-ſhaped, ſeſſile, toothed, three-nerved, naked and wrinkled above, clothed with a ſilky down underneath." *Leaves* alternate, ſometimes five-nerved, an inch and half long. *Flowers* collected into a denſe terminal corymb; calyx-ſcales linear-acute, almoſt equal, a little ſcarious at the edges; down reddiſh, a little longer than the calyx. Found by Commerſon in the Iſle of Bourbon. 75. C. *lithoſpermifolia*. Lam. 41. Willd. 62. "Leaves lanceolate, toothed at the tip, hairy on both ſurfaces, crowded; inner calyx-ſcales dry." A humble ſhrub, not more than four or five inches high. *Stem* branched; branches leafy at the ſummit. *Leaves* narrowed towards the baſe, almoſt three-nerved, near an inch and half long. *Flowers* in a terminal corymb; peduncles villous, with narrow bractes; calyx-ſcales linear-acute; outer ones villous. Found by Commerſon in the Iſle of France. 76. C. *heliotropifolia*. Lam. 37. Willd. 63. "Leaves ſeſſile, oblong, quite entire, ſomewhat downy; corymb terminal, villous; flowers cluſtered." *Leaves* four or five inches long, one inch broad, growing near each other at the top of the branches, clothed on both ſurfaces with a cottony reddiſh down. *Flowers* from four to ſix in a corymb; peduncles villous; calyx-ſcales linear, villous; down reddiſh, longer than the calyx. Found by Commerſon in the Iſle of Bourbon. 77. C. *panamenſis*. Willd. 64. "Leaves ſeſſile, ovate-lanceolate, ſcabrous, quite entire, triply-nerved; panicle terminal." *Stem* cylindrical, ſtriated, ſmooth. *Leaves* an inch and half long, reticularly veined. *Peduncles* long, one or two-flowered; calyx-ſcales oblong, adpreſſed; down reddiſh. 78. C. *pyrifolia*. Lam. 36. Willd. 65. "Leaves egg-ſhaped, acuminate, ſomewhat toothed, ſmooth; corymb panicled, lax." *Branches* ſmooth. *Leaves* alternate, petioled. *Flowers* whitiſh; calyx ſhort, ſmooth, imbricated; down reddiſh, longer than the calyx. Found by Commerſon in the iſland of Java. 79. C. *argentea*. Lam. 24. Willd. 67. "Leaves egg-ſhaped, tomentous-ſilky, half embracing the ſtem; flowers ſeſſile, terminal, cluſtered." Abundantly clothed, like a gnaphalium, with a ſilvery ſilky down. *Stem* cylindrical, ſimple. *Leaves* ſcattered, numerous. *Flowers* yellow, two or three together; florets ſhorter than the calyx; calyx-ſcales narrow, erect, bearded." Found by Commerſon in the Iſle of Bourbon. 80. C. *populifolia*. Lam. 25. Willd. 68. "Leaves heart-ſhaped, petioled, downy, quite entire; calyxes hemiſpherical." *Branches* ſhort, thick, ſtiff, knotty, cottony, ſtriated, leafy towards the ſummit. *Leaves* acute. *Flowers* large, from five to ſeven in a terminal corymb; peduncles an inch long, ſimple, thickened under the calyx, angular; calyx cottony, imbricated; florets numerous; down reddiſh, longer than the calyx, ſtiffiſh. Found by Commerſon in the Iſle of France. 81. C. *carolinenſis*. Willd. 69. Jacq. Ic. rar. 3. tab. 585. "Leaves ovate-lanceolate, quite entire, hoary, downy underneath; corymb terminal, compound." *Stem* five feet high. *Branches* cylindrical, downy. *Leaves* at leaſt two inches long, petioled. *Flowers* violet, ſmall; calyx-ſcales oblong, downy. A native of Carolina, Florida, and the Bahama Iſlands. 82. C. *odorata*. Linn. 15. Mart. 17. Lam. 26. Willd. 70. (C. verbaſci folio undulato; Plum. Sp. 9. Burm. Amer. tab. 97. Tourn. Inſt. 455. C. major odorata, five baccharis: Sloan. Jam. Hiſt. 1. 258. tab. 152. fig. 1. β C. folio verbaſci dentato; Plum. Sp. 9. Burm. Amer. tab. 97. Tourn. 455.) "Leaves egg-ſhaped, petioled, ſomewhat toothed, downy; flowers aggregate, in a corymb; calyxes hemiſpherical." An odoriferous ſhrub, from four to ſix feet high. *Stem* erect, branched. *Leaves* four or five inches long, more than two inches broad, ſome entire, others ſlightly toothed. *Flowers* purple: peduncles ſhort, cottony; calyx imbricated, cottony; ſcales ſhort, rather obtuſe. A native of South America. 83. C. *arboreſcens*. Linn. Sp. Pl. 18. Mart. 20. Lam. 27. Willd. 71. Plum. Sp. 10. Burm. Amer. tab. 132. fig. 2. (C. fruticoſa flore pallido purpureo; Sloan. Jam. 124. Hiſt. 1. 257. Eupatorium erectum hirſutum, foliis oblongis rugoſis Brown. Jam. 313.) "Leaves egg-ſhaped, quite entire, acute, downy underneath; ſpikes recurved, unilateral, bractes reflexed.” Four or five feet high. *Stem* erect, branched towards the top; branches divaricated, ſub-divided, bending down, diverging, villous, with a blackiſh ſhaggineſs. *Leaves* two inches long, alternate, on ſhort petioles, wrinkled, green above; pale, pubeſcent, and nerved underneath. *Flowers* pale purple, in a unilateral ſpike, or rather raceme. A native of South America. 84. C. *ſcorpioides.* Lam. 28. “Leaves ovate-lanceolate, petioled, entire, even-ſurfaced; ſpikes unilateral, revolute, naked.” Nearly allied to the preceding, and perhaps only a variety, but its leaves are even-ſurfaced above, and almoſt ſmooth underneath. *Flowers* in linear racemes, recurved like the tail of a ſcorpion; calyx-ſcales lanceolate; inner ones a little villous at the tip; down white. Found by Commerſon in Brazil. 85. C. *fruticoſa.* Linn. Sp. Pl. 17. Mart. 21. Lam. 29. Willd. 72. (C. fruteſcens, cydoniæ folio; Plum. Sp. 9. Burm. Amer. tab. 95. fig. 1. Tourn. 455.) “Leaves egg-ſhaped, quite entire, obtuſe; flowers ſeſſile, alternate; branchlets zig zag.” A petty ſhrub, reſembling roſemary, but with longer and more ſlender branches. *Leaves* numerous, alternate, petioled, white with down. *Flowers* purple, axillary, ſolitary. A native of South America. 86. C. *inciſa.* Mart. 29. Willd. 43. Hort. Kew. 3. 184. “Leaves egg-ſhaped, ſomewhat heart-ſhaped, hairy-viſcid, toothed, auricled at the baſe; receptacle honey-combed.” Whole plant clothed with viſcid hairs. *Stem* three feet high. *Leaves* an inch long, petioled, deeply cut. *Corymbs* terminal, few-flowered, on long peduncles. A native of the Cape of Good Hope, found by Francis Maſſon. 87. C. *arbutifolia.* Lam. 52. Willd. 74. “Leaves egg-ſhaped, veined, ſharply toothed, crowded; flowers ſeſſile, terminal, globular.” A ſmooth ſhrub, a foot and half high, or more. *Branches* erect, generally faſciculated, leafy on their upper part, naked towards the baſe, and marked with the ſcars of fallen leaves, with a decurrent line on each ſide. *Leaves* ſcattered, ſeſſile, approximate, narrowed at the baſe. *Flowers* rather large, cluſtered; calyx imbricated; ſcales ovate-lanceolate; down reddiſh. Found by Joſeph Juſſieu in Peru. 88. C. *myrſinites.* Lam. 48. Willd. 75. “Leaves lanceolate, two-toothed; flowers globular, ſomewhat cluſtered, terminal.” *Branches* ſlender, leafy on the upper part, ſomewhat angular. *Leaves* ſmall. *Flowers* very ſmall, almoſt ſeſſile; calyx imbricated; ſcales egg-ſhaped, acute, ſlightly ciliated on the upper edge. A native of St. Domingo. 89. C. *magellanica.* Lam. 47. Willd. 76. “Smooth; leaves very ſmall, ovate-wedge-ſhaped, obſoletely three-toothed; flowers lateral, ſolitary, terminating the branchlets.” A low, much-branched, ſpreading ſhrub. *Leaves* numerous, approximate, obtuſe. *Flowers* oval, ſeſſile; calyx-ſcales egg-ſhaped. Found by Commerſon in the ſtraits of Magellan. 90. C *cuneifolia.* Lam. 46. Willd. 77. (Erigeron tricuneatum; Linn. jun. Supp. ?) “Smooth; leaves wedge-ſhaped, toothed towards the tip; flowers axillary and terminal, ſomewhat cluſtered.” Much-branched, viſcid. *Leaves* ſeſſile. *Flowers* nearly ſeſſile; calyx egg-ſhaped, imbricated; ſcales ovate-acute, a little ſcarious, fringed towards the tip; down reddiſh, longer than the calyx. Found by Commerſon near Monte Video, and at the ſtraits of Magellan. The younger Linnæus's plant was found by Mutis in New Mexico. 91. C. *retuſa.* Lam. 39. Willd. 78. “Leaves ovate-wedge-ſhaped, retuſe, crenated near the tip, pubeſcent; flowers globular, terminal, and axillary, forming a corymb.” *Stem* a foot and half or two feet high; branches numerous, cylindrical, naked, and knotty below, leafy near the ſummit. *Leaves* ſcattered, thickiſh, ſucculent, with three or five longitudinal nerves. *Flowers* whitiſh; peduncles branched, pubeſcent; calyx hemiſpherical, imbricated; ſcales egg-ſhaped, inner ones ſomewhat ſcarious and lacerated at the edges; hermaphrodite florets of the diſk numerous; female ones of the circumference in two or three ranks. Found by Commerſon in the Iſle of Bourbon. 92. C. *buxifolia.* Lam. 50. Willd. 79. “Smooth; branches ſtiff; leaves oblong-egg-ſhaped, quite entire; flowers lateral, ſeſſile.” About four or five feet high. *Branches* erect, cloſe, ſomewhat filiform, angular, tubercled, leafy towards the ſummit. *Leaves* ſix or ſeven lines long, ſcattered, approximate, almoſt ſeſſile, narrowed towards the baſe. *Flowers* axillary, ſolitary; calyx imbricated; ſcales ovate-oblong, ſlightly ciliated near the tip; down whitiſh. Found in Peru by Joſeph Juſſieu. 93. C. *carthagenenſis.* (C. ſpicata; Mart. 39.) “Leaves egg-ſhaped, three-nerved; flowers in axillary ſpikes.” *Stem* ten or twelve feet high, dividing at the top into many woody branches. *Leaves* an inch long, alternate, ſitting cloſe to the branches, acuminate. *Flowers* white. A native of Carthagena in New Spain.

* * *Leaves decurrent.*

Herbaceous or Shrubby.

94. C. *geniſtelloides.* Lam. 56. Willd. 80. (Canambaya; Marg. Braſ. 78.) “Stems ſomewhat ſhrubby, without leaves, nearly ſmooth; rings interrupted by joints, terminated by a ſhort ſcale; flowers ſeſſile, lateral, alternate.” *Stems* from a foot to three feet long. *Wings* between each joint, broader on one ſide than on the other, decuſſated, green. *Flowers* yellow, ſituated at the joints in the upper part of the plant, ſolitary in the axil of the ſcale; calyx round, almoſt ſmooth, imbricated; ſcales ovate-acute; down reddiſh. A native of Peru. 95. C. *articulata.* Lam. 57. Ill. Pl. 697. fig. 4. Willd. 81. “Stem much branched, interruptedly winged; leaves oblong-elliptical, ſhorter than the joints; flowers panicled.” *Stem* a foot and half high; branches compound, ſmooth, viſcid towards the ſummit. *Flowers* pale yellow, ſeſſile, almoſt globular, often cluſtered together in a kind of terminal ſpike or panicle; calyx imbricated, ſcales obtuſe. Found by Commerſon at Monte Video. 96. C. *ſagittalis.* Lam. 58. Willd. 82. “Leaves decurrent, lanceolate, finely toothed, a little ſcabrous, green on both ſurfaces; flowers cluſtered together at the top of the branches.” *Stem* winged as in the two preceding. *Leaves* alternate, two or three inches long. *Flowers* from three to five in a cluſter; calyx ſhort; ſcales egg-ſhaped, ſomewhat pubeſcent; florets numerous; down longer than the calyx. Found by Commerſon at Monte Video. 97. C. *criſpata.* Willd. 83. Vahl. 1. 71. Forſk. Arab. 119. n. 495. “Leaves lanceolate, ſerrate-toothed, naked; peduncles one-flowered; ſtem ſhrubby.” Whole plant ſmooth. *Stem* erect, ſtriated; branches and peduncles with curled tooth-ſinuated wings. *Leaves* an inch and half long, remote. *Flowers* two or three at the top of the branches; peduncles half an inch long; calyx-ſcales linear-lanceolate, the length of the florets in the circumference. A native of Arabia Felix. 98. C. *arabica.* Willd. 84. (Erigeron decurrens; Vahl. Symb. 1. 72.) “Leaves linear, quite entire, downy; flowers panicled.” *Stem* erect, ſtriated, pubeſcent, downy near the top; branches woody. *Leaves* an inch and half long. *Pedicels* capillary, with two minute bractes near the top; calyxes villous; ſcales briſtle-ſhaped, ſhorter than the down. A native of Arabia Felix. 99. C. *thapſoides.* Willd. 85. Marſch. de Biberſt. Fl. Caucas. “Leaves egg-ſhaped, mucronate, downy; lower ones ſerrated; flowers in corymbs.” *Root* perennial. A native of Mount Caucaſus, near the ſhores of the Caſpian ſea. 100. C. *virgata.* Linn. Sp. Pl. 5. Mart. 22. Lam. 53. Willd. 86. (C. helenii folio; Pl. Sp. 9.

Burm. Amer. tab. 98. fig. 2. C. anguſtifolia ſubincana; Brown. Jam. 318. Helichryſum caule alato; Sloan. Jam. 125. Hiſt. 1. 206. tab. 152. fig. 5.) "Leaves linear-lanceolate, finely ſerrated, downy underneath; ſpikes terminal, elongated, interrupted." *Root* perennial, woody. *Stem* about two feet high, erect. *Leaves* five or ſix inches long, alternate, green and ſmooth above, whitiſh and downy underneath. *Flowers* pale purple, ſeſſile, lower ones three together, upper ones ſolitary; calyx oblong, imbricated; ſcales acute, rather hairy. A native of St. Domingo, Jamaica, and Carolina. 101. C. *rugoſa*. Willd. 87. Vahl. Symb. 1. 71. "Leaves elliptical, crenated, downy underneath; flowers in a head." *Branches* woody; wings quite entire, ſmooth on one ſide, very downy on the other. *Leaves* an inch and half long, wrinkled, ſmooth above, downy underneath. *Peduncles* the length of the leaves, from the axils of the upper leaves. A native of Brazil. 102. C. *alopecuroides*. Lam. 54. Willd. 88. Plum. Sp. 9. Burm. Amer. tab. 98. fig. 1. "Leaves egg-ſhaped, finely ſerrated, downy underneath; ſpike terminal, denſe, interrupted at the baſe." *Root* perennial, ſpindle-ſhaped, woody. *Stems* about two feet high; wings green on one ſide, white and downy on the other. *Leaves* alternate; green, ſmooth, ſomewhat wrinkled above, whitiſh and downy underneath. *Flowers* ſeſſile; calyx imbricated, downy at the baſe; inner ſcales longer and ſmooth towards the tip; down rather long. A native of Martinico and Brazil. 103. C. *ſpicata*. Lam. 55. Willd. 809. Cav. Ic. 1. 8. tab. 12. "Stem ſomewhat ſhrubby, ſimple; leaves ovate-lanceolate, finely ſerrated, downy underneath; ſpike terminal, denſe, entire." *Stem* a foot and half high, erect, ſtriated with green and white. *Leaves* from three to four inches long, ſix or eight lines broad, alternate, green and ſmooth above, white and downy underneath. *Flowers* ſeſſile; calyx clothed with a thick down, imbricated; ſcales narrow-lanceolate, inner ones longer. Female florets intermingled with the hermaphrodites. A native of South America. Obſ. As the genera baccharis and conyza now ſtand, this ſpecies belongs to the former. 104. C. *redolens*. Willd. 90. (Gnaphalium redolens; Forſt. Prod. n. 535.) "Leaves lanceolate, quite entire, downy underneath; ſpikes terminal, glomerated." *Stem* woody, branched. *Leaves* half an inch long, obtuſe. *Spikes* half an inch long; calyxes villous. A native of New Caledonia. 105. C. *decurrens*. Linn. Sp. Pl. 6. Mart. 23. Willd. 91. (C. alopecuroides, β. Lam.?) "Leaves lanceolate, finely ſerrated; ſtem ſomewhat dichotomous; flowers axillary, ſeſſile, glomerated." *Root* annual. Whole plant downy. *Stem* about three inches long, erect. A native of the Eaſt Indies.

Obſ. The only eſſential diſtinction between baccharis and conyza conſiſts in the former having the hermaphrodite and female florets intermingled with each other; whereas, in the latter, the female florets are all collected in the circumference, but without rendering the compound flower properly radiate. In dried ſpecimens, it is not always poſſible to determine theſe characters with certainty; ſo that, as La Marck obſerves, ſome of the foregoing ſpecies may belong to baccharis. Juſſieu, Gærtner, and La Marck, are of opinion, that the two genera are ſcarcely diſtinct. The latter, however, ſuggeſts that two genera might be formed out of them, diſtinguiſhed by the form of the calyx: one of them with the calyx of erigeron, *i. e.* not properly imbricated, having linear, nearly equal ſcales in ſeveral ranks; the other with the calyx of eupatorium, *i. e.* ſtrictly imbricated. If any of the ſpecies ſhould be found to have all the florets hermaphrodite, they muſt be referred to eupatorium. Erigeron differs in having a radiate flower.

Willdenow, in the third part of his third volume, publiſhed ſince our article baccharis went to the preſs, has added the following ſpecies to that genus. 1. B. *viſcoſa*, 4. Lam. "Leaves elliptical, rather acute, three-nerved, quite entire, petioled; younger ones viſcid." *Flowers* in terminal, compound, peduncled corymbs. A native of the Iſles Mauritius and Bourbon. 2. B. *arbutifolia*, 6. Vahl. Symb. 3. 97. "Leaves oblong, ſeſſile, rigid, acutely ſerrated, reticularly veined; corymb terminal; flowers cluſtered." A ſmooth ſhrub. A native of Peru. 3. B. *ſeſſiliflora*, 7. Vahl. 3. 97. "Leaves oblong, ſeſſile, toothed, and entire; flowers terminal, ſeſſile." *Flowers* twice as large as thoſe of B. halimifolia. A native of Brazil. 4. C. *villoſa*, 9. Vahl. 3. 98. "Leaves lanceolate, petioled, ſerrated on the upper part, villous-downy underneath." *Branches*, *peduncles*, and *pedicels*, villous-downy. *Corymbs* long, peduncled, faſtigiate; calyx-ſcales briſtle-ſhaped. A native of Arabia Felix. 5. C. *tridentata*, 12. Vahl. 3. 98. "Leaves ſeſſile, wedge-ſhaped, even-ſurfaced, three-toothed at the tip." *Flowers* in terminal and axillary corymbs. A native of Brazil. 6. B. *dioica*, 13. Vahl. 3. 98. tab. 74. "Leaves wedge-ſhaped, ſomewhat retuſe, quite entire, even-ſurfaced, three-nerved; flowers dioicous." *Flowers* from four to ſeven, ſeſſile, cluſtered. A native of Montſerrat and Dominica.

Conyza aſteroides of Linnæus and Martyn is aſter conyzoides of Willdenow. It is excluded from the preſent genus by its radiate flower.

CONYZA *ægyptiaca juniperifolia*; Vaill. See STAEHELINA *ſpinoſa*.

CONYZA *æthiopica, flore bullato aureo*; Pluk. See CHRYSOCOMA *comaurea*.

CONYZA *africana fruteſcens, foliis ericæ hamatis*. See STOEBE *æthiopica*.

CONYZA *africana fruteſcens, folio ſalviæ*; Tourn. See TARCHONANTHUS *camphoratus*.

CONYZA *africana latifolia fætida*; Pluk. Moris. See GNAPHALIUM *fætidum*.

CONYZA *africana tenuifolia ſubfruteſcens*; Dill. See CHRYSOCOMA *ſcabra*.

CONYZA *americana fruteſcens fætidiſſima*; Dill. See BACCHARIS *fætida*.

CONYZA *americana ſcandens, foliis ſubrotundis*; Amm. Herb. See MIKANIA *houſtonis*. *Eupatorium*; Houſt. Linn.

CONYZA *anthelmintica*; Linn. See VERNONIA *anthelmintica*.

CONYZA *aquatica, aſteris flore aureo*; C. Bauh. See INULA *britannica β*.

CONYZA *arboreſcens lutea, folio trifido*; Plum. See CALEA *lobata*.

CONYZA *aromatica fruteſcens mauritanica*; Pluk. See PTERONIA *camphorata*.

CONYZA *cærulea acris*; C. Bauh. See ERIGERON *acre*.

CONYZA *cærulea alpina major*; C. Bauh. See ERIGERON *uniflorum*.

CONYZA *cærulea alpina minor*; C. Bauh. See ERIGERON *alpinum*.

CONYZA *capitata, ſeu globoſa*; Bocc. See INULA *viſcoſa*.

CONYZA *Dioſcoridis*; Raw. See BACCHARIS *Dioſcoridis*.

CONYZA *fæmina Theophraſti*; C. Bauh. See ERIGERON *graveolens*.

CONYZA *fætida*; Lam. See BACCHARIS *fætida*.

CONYZA *fruteſcens, foliis anguſtioribus*; Few. Peruv. See BACCHARIS *ivæfolia*.

CONYZA *fruticoſa ciſti odore*; Sloan. See EUPATORIUM *villoſum*.

CONYZA *fruticoſa ciſti odore, floribus pallide purpureis*; Sloan. See CALEA *jamaicenſis*.

CONYZA *helenitis mellita incana*; Lob. See CINERARIA *campeſtris*.

CONYZA *incana*; C. Bauh. See CINERARIA *campeſtris*.

CONYZA *lini foliis aſperis*; Amm. Ruth. See CHRYSOCOMA *biflora*.

CONYZA *lobata*; Linn. See CALEA *lobata*.

CONYZA *major altera*; C. Bauh. See BACCHARIS *Dioſcoridis*.

CONYZA *major altera*; Thal. See BUPHTHALMUM *ſalicifolium*.

CONYZA *major*; Dod. See INULA *viſcoſa*.

CONYZA *major, flore globoſo*; C. Bauh. See INULA *pulicaris*.

CONYZA *marina*; Magnol. Moris. See ERIGERON *tuberoſum*.

CONYZA *mas Theophraſti*; C. Bauh. See INULA *viſcoſa*.

CONYZA *media aſteris flore luteo*; C. Bauh. See INULA *dyſenterica*.

CONYZA *media criſpa*; Rai. See INULA *pulicaris β*.

CONYZA *media, monſpelienſi affinis*; J. Bauh. See INULA *ſpiræafolia*.

CONYZA *melitenſis*; Bocc. See INULA *fœtida*.

CONYZA *minima*; Dod. See INULA *pulicaris*.

CONYZA *minor exotica*; C. Bauh. See INULA *pulicaris β*.

CONYZA *minor hiſpanica*; Pluk. See INULA *pulicaris β*.

CONYZA *minor vera*; Lob. Barr. See ERIGERON *graveolens*.

CONYZA *paluſtris ſerratifolia*; C. Bauh. See SENECIO *paludoſus*.

CONYZA *pannonica lanuginoſa*; C. Bauh. Moriſ. See INULA *oculus chriſti*.

CONYZA *præalta*; Bocc. See INULA *bifrons*.

CONYZA *rugoſa*; Hort. Kew. See ERIGERON *rugoſum*.

CONYZA *ſcandens, ſolaris folio, anguloſa*; Plum. See MIKANIA *ſcandens*.

CONYZA *ſericea*; Willd. See CHRYSOCOMA *ſericea*.

CONYZA 3. *auſtriaca*; Cluſ. See INULA *oculus chriſti*.

CONYZA *ſyriæ*; J. Bauh. Rai. Gron. See BACCHARIS *Dioſcoridis*.

CONYZA *tomentoſa & incana*; Amm. Ruth. See CHRYSOCOMA *villoſa*.

CONYZIS AFFINIS; C. Bauh. See INULA *britannica*.

CONYZOIDES; Dill. See ERIGERON *acre*.

CONZ. See CONSARBRUCK.

CONZA, in *Geography*, a town of Naples, in the province of Principato Ultra, conſidered as the capital of the province; ſituated at the foot of the Apennines, near the head of the Oſauto; the ſee of an archbiſhop. The chief article of its commerce is marble. Diſtant 48 miles E. of Naples. N. lat. 40° 50′. E. long. 15° 10′.

COOCH BAHAR, or COOS-BAYHAR, a diſtrict of Bahar, in the province of Bengal, ſeparated from that of Rungpore, by the river Durlah. In this diſtrict, an uſage of a very ſingular kind has prevailed from remote antiquity, and actually exiſts at this day. If a reiut, or peaſant, owes a ſum of money, and cannot ſatisfy his creditor, he is compelled to give up his wife as a pledge, and poſſeſſion of her is kept till the debt is diſcharged. It ſometimes happens, according to report, that the wife of a debtor is not redeemed for the ſpace of one, two, or three years; and then, if during her reſidence and connection with the creditor, a family ſhall have been the conſequence, half of it is conſidered as the property of the perſon with whom ſhe lived, and half that of her real huſband. This country has a moſt wretched appearance, and its inhabitants are a miſerable and puny race. Thoſe of the lower ranks, without ſcruple, diſpoſe of their children for ſlaves, to any purchaſer, and for a very trifling conſideration. Nothing is more common, in this unnatural traffic, than to ſee a mother dreſs up her child, and bring it to market, with no other view or hope, than to enhance the price ſhe may procure for it. Indeed the extreme poverty and wretchedneſs of theſe people will ſufficiently appear, when we reflect that the value of the peaſant's ſubſiſtence amounts to no more than one penny a day, even allowing him to make his meal of two pounds of boiled rice, with a due proportion of ſalt, oil, vegetable, fiſh, and chili, the latter of which is a kind of red pepper, in univerſal uſe, made from the "capſicum annuum" of Linnæus. The ſituation of the diſtrict exhibits an union of facts, not unfrequently obſerved, *viz.* the great facility of obtaining food, and at the ſame time the wretched indolence of the lower order of inhabitants. Turner's Thibet, p. 11, &c.

COOGHEN, LEONARD VAN, in *Biography*, a painter, born at Haarlem in 1610, and ſcholar of Jac. Jordaens. He alſo amuſed himſelf with etching, and publiſhed two or three ſets of prints, in which the ſtyle of Salvator Roſa was imitated with the moſt happy ſucceſs. Theſe etchings, ſeveral of which repreſent groups of military figures, are dated from 1664 to 1666. He died in 1681. Heinecken.

COOK, JAMES, one of the moſt eminent navigators and diſcoverers of unknown territories and ſeas, recorded either in ancient or modern hiſtory, was deſcended from an obſcure family in Northumberland: his father, James Cook, having occupied the humble ſtation of a ſervant in huſbandry, and his mother, whoſe Chriſtian name was Grace, being a perſon of the ſame rank and condition. The ſubject of this article claims a more diſtinguiſhed notice, and a more extended detail of particulars, than we have been accuſtomed to introduce in thoſe biographical ſketches that occur in this work. Independently of the ſingular merit of captain Cook himſelf, to which a peculiar tribute is due, his voyages and diſcoveries are ſo immediately connected with ſcience, both geographical and nautical, as to entitle them to a conſpicuous place in a general Dictionary of the Arts and Sciences. The parents of captain Cook, who were noted in their lowly ſtation for honeſty, ſobriety, and diligence, were ſettled for ſome time before his birth at Marton, a village in the North Riding of Yorkſhire; and in this place their ſon James, deſtined to give celebrity to their name and family, was born on the 27th of October, in the year 1728. Having received the firſt rudiments of education at his native place, he was further inſtructed in writing, and the firſt five rules of arithmetic at Ayton, near which place his father was ſettled in the ſervice of Thomas Skottow, eſq.; and, at the age of 13 years, he was apprenticed to a ſhop keeper, at Staiths, a fiſhing town about 10 miles from Whitby. The ſea, however, was the object towards which he manifeſted an early inclination; and, in conſequence of ſome diſagreement with his maſter, he obtained his diſcharge, and determining to indulge his natural propenſity, he bound himſelf for ſeven years to Meſſrs. Walkers of Whitby, quakers by religious profeſſion, who employed two ſhips in the coal trade. At the expiration of his apprenticeſhip, he continued in veſſels of this deſcription, as a common ſailor, till at length he was appointed mate in one of Mr. John Walker's ſhips. At this time, he was not diſtinguiſhed by any peculiar traits of character, though without doubt he muſt have acquired a conſiderable degree of knowledge in practical navigation. In the ſpring of the year 1755, when hoſtilities commenced between England and France, Mr. Cook, and the ſhip to which he belonged, happened to be in the river Thames; and after concealing himſelf for ſome time, to avoid being impreſſed, he determined to enter voluntarily into the Britiſh navy. His firſt ſituation in his majeſty's ſervice, was on board the Eagle man of war, to the command of which, captain (afterwards ſir Hugh) Palliſer was appointed in October 1755. As an active diligent ſeaman, he recommended himſelf to the captain's notice; and in conſequence of his own acknowledged merit, as well as ſome private interference, he obtained on the 16th of May, 1759, a maſter's warrant for the Grampus ſloop; but this appointment not taking effect, he was made maſter of the Garland, a ſhip which had ſailed before he could join her; and therefore, on the 19th of May, he was appointed to the Mercury. This ſhip was deſtined to North America, where ſhe joined the fleet under the command of ſir Charles Saunders, which, in conjunction with the land forces under general Wolfe, was engaged in the famous ſiege of Quebec. As it was neceſſary to take the ſoundings in the river St. Lawrence, between the iſland of Orleans and the north ſhore, directly in the front of the French fortified camp at Montmorency and Beauport, Mr. Cook was recommended by captain Palliſer, who well knew his ſagacity and reſolution, to this difficult and hazardous ſervice. He performed it, with great perſonal riſk, to the ſatisfaction of his employers; and furniſhed the admiral with a complete and correct draught of the channel and ſoundings. Before this time, it is thought that he had ſcarcely ever uſed a pencil, and that he had no knowledge of drawing. He afterwards ſurveyed thoſe parts of the river, below Quebec, which navigators had found to be attended with difficulty and danger; this buſineſs was executed with his cuſtomary diligence and ſkill; and when his undertaking was finiſhed, his chart of the river St. Lawrence was publiſhed, with the neceſſary ſoundings and directions for navigating that river. This chart has ſuperſeded the neceſſity of any other. After the expedition to Quebec, Mr. Cook was appointed, by warrant from lord Colvill, maſter of the Northumberland man of war; and in this ſtation, his conduct was ſuch, as to gain him the eſteem and friendſhip of his commander. During the ſtation of his ſhip at Halifax, he read Euclid, and devoted his leiſure hours to the ſtudy of aſtronomy, and other branches of ſcience. In September 1762, the Northumberland came to Newfoundland, to aſſiſt in the recapture of the iſland from the French; and after this ſervice was accompliſhed, Mr. Cook ſurveyed the harbour of Placentia, and the heights of the place, with a diligence which engaged the notice of captain (afterwards admiral) Greaves, the governor of Newfoundland. The governor formed a very high opinion of his abilities and character; and this opinion was amply confirmed by the concurring teſtimony of all the officers under whom he had ſerved. Upon Mr. Cook's return to England, towards the cloſe of the year 1762, he married an amiable woman, who deſerved and enjoyed his tendereſt affection and regard. Early in the year 1763, he accompanied captain Greaves to Newfoundland, as ſurveyor of its coaſts; and having executed the buſineſs that had been aſſigned him, he returned to England. In April 1764, he was appointed, under the orders of commodore Palliſer, marine ſurveyor of Newfoundland and Labradore; and of the ſatisfactory manner in which he executed this office, the charts which he afterwards publiſhed, afford ſufficient evidence. Theſe ſervices were continued till the year 1767; and whilſt he was employed in them, he tranſmitted to the Royal Society an obſervation of the eclipſe of the ſun at Newfoundland, with the longitude deduced from it, (ſee Phil. Tranſ. vol. 57.) from which our navigator appears to have already acquired the character of an able mathematician. But a new and more intereſting ſcene opens upon us in the proſecution of theſe memoirs. A ſpirit of diſcovery had been excited towards the latter end of the 15th century, and in the following century it was very vigorous and active; but ſoon after the commencement of the 17th century, it began to decline: at a ſubſequent period, during the reign of king George II., it again began to revive; and two voyages were performed for the purpoſe of diſcovering a north-weſt paſſage through Hudſon's Bay. But the nobleſt diſplays of this ſpirit were exhibited during the preſent reign: and it was reſerved for Mr. Cook to furniſh the moſt illuſtrious example of its influence. Soon after the peace of 1763, two voyages round the world were undertaken by captains Byron, Wallis, and Carteret, to whom we are indebted for ſeveral diſcoveries, which ſerved to extend the knowledge of geography and navigation; but before the return of the two laſt of theſe commanders, another voyage was projected, on a more extenſive ſcale than either of the former. The tranſit of Venus in 1769, which was likely to be obſerved with the greateſt advantage in ſome of the iſlands of the South Sea, afforded a peculiar inducement to this expedition; and after a variety of preliminary conſultations and debates, Mr. Cook, who was ſtrongly recommended by Mr. Stephens, ſecretary to the admiralty, and by ſir Hugh Palliſer, who had long known his abilities and character, was appointed to the command of it, with the rank of a lieutenant in the royal navy, to which he was promoted on the 25th of May 1768. A veſſel of 370 tons, called the Endeavour, was prepared for this purpoſe; but before the neceſſary arrangements were compleated captain Wallis returned, and upon being conſulted he recommended Port Royal Harbour in George's iſland, now known by the name of Otaheite, as the moſt proper place for the propoſed obſervation of the tranſit. Lieutenant Cook was accompanied by Mr. Charles Green, who had been aſſiſtant to Dr. Bradley at the Royal Obſervatory at Greenwich, and alſo by Joſeph Banks, eſq. now ſir Joſeph Banks, bart. and preſident of the Royal Society, and Dr. Solander, gentlemen whoſe zeal for the promotion of ſcience have been uniform and ardent. Lieutenant Cook had further views in this voyage than the mere obſervation of the tranſit, and accordingly, when that buſineſs was accompliſhed, he was directed to purſue further diſcoveries in the great Southern Ocean. The complement of Cook's ſhip conſiſted of 84 perſons, beſides the commander; ſhe was victualled for 18 months; and furniſhed with 10 carriage and 12 ſwivel guns, together with an ample ſtore of ammunition and other neceſſaries. On the 26th of Auguſt our navigators ſet ſail from Plymouth Sound; and on the 13th of September anchored in Funchiale road, in the iſland of Madeira. Here they were hoſpitably entertained; and having laid in a freſh ſtock of beef, water, and wine, they left the iſland in the night of the 18th of September. In their way to Rio de Janeiro, they had an opportunity of accounting for that luminous appearance of the ſea, which had been often noticed by navigators, and aſcribed to various cauſes. They determined by experiment, fully to their ſatiſfaction, that the flaſhes which they had obſerved proceeded from ſome luminous animal. Their reception at Rio de Janeiro was very different from that which they had met with at Madeira; and it was through mere neceſſity that they were detained there from the 13th of November to the 7th of the following month, when they proceeded on their voyage. On the 14th of January 1769, lieutenant Cook entered the ſtrait of Le Maire, and having contended for ſome time with a violent tide, he anchored on the next day, firſt before a ſmall cove, which was underſtood to be Port Maurice, and afterwards in the bay of Good Succeſs During the continuance of the Endeavour in this ſtation, Mr. Banks, Dr. Solander, Mr. Monkhouſe the ſurgeon, and Mr. Green the aſtronomer, with their attendants and ſervants, and two ſeamen, aſcended the mountains in ſearch of plants. This excurſion has been often related, and the effect of the cold of the climate is well known. (See COLD. For an account of the inhabitants of the deſolate regions adjacent to this ſtrait; ſee LE MAIRE.) It has been a queſtion among former navigators which is the beſt paſſage from the Atlantic to the Pacific ocean; and the doubling of Cape Horn has been ſo much dreaded, that it has been thought more eligible to paſs through the ſtrait of Magalhaens or Magellan. Lieutenant Cook has ſettled this point; for he was no more than 33 days in coming round the land of Terra del Fuego, from the E. entrance of the ſtrait of Le Maire till he had advanced about 12 degrees to the weſtward and 3½ to the northward of the ſtraits of Magalhaens, and during this time the ſhip received ſcarcely any damage; whereas it would have required three months to reach the Pacific ocean through this ſtrait, and in paſſing it his people would have been much fatigued, and the anchors, cables, ſails, and rigging of the veſſel would have been much injured. In ſhort, lieutenant Cook, by ſetting the example of doubling Cape Horn, and by accurately aſcertaining the latitude and longitude of different places, as well as by his inſtructions to future voyagers, has performed the moſt eſſential ſervice to this part of navigation. In the proſecution of the voyage from Cape Horn to Otaheite, ſeveral iſlands were diſcovered, to which were given the names of Lagoon iſland, S. lat. 18° 47'. W. long. 139° 28', Thrumb-cap, S. lat. 18° 35'. W. long. 139° 48', Bow iſland, S. lat. 18° 23'. W. long. 141° 12', the Groups, the eaſternmoſt in S. lat. 18° 12'. W. long. 142° 42', Bird iſland, S. lat. 17° 48'. W. long. 143° 35', and Chain iſland, S. lat. 17° 23'. W. long. 145° 54'. Moſt of theſe iſlands were inhabited; and the verdure, or groves of palm-trees, which were viſible in ſome of them, gave them the appearance of a terreſtrial paradiſe to perſons who had ſo lately witneſſed the dreary coaſts of Terra del Fuego.

On the 13th of April the Endeavour anchored in Port Royal bay, called by the natives "Matavai," in the iſland of Otaheite. Having fixed upon a place proper for accompliſhing the grand object of their commiſſion, they erected an obſervatory, S. lat. 17° 29' 15". W. long. 149° 32' 30", and carried their aſtronomical quadrant, and ſome other inſtruments, on ſhore. On the following day, very much to their ſurpriſe and grief, the quadrant was not to be found. By the judicious and ſpirited exertions of Mr. Banks, the inſtrument was reſtored. The tranſit was obſerved with great advantage. A particular account of the obſervation may be ſeen in the Phil. Tranſ. vol. lxi. p. 397. See VENUS. As we ſhall have occaſion to mention ſome of the leading circumſtances that occurred on this and other viſits to Otaheite, under that article, we ſhall attend lieutenant Cook in his departure from the iſland. Previouſly to their ſetting ſail, Tupia, one of the natives, the prime miniſter of Oberea, when ſhe was in the height of her power, and chief prieſt of the country, who had been a conſtant companion of the Engliſh during their abode on the iſland, came on board the ſhip, with a boy thirteen years of age, and intreated that they might be permitted to proceed with them on their voyage. Lieutenant Cook gladly accepted the propoſal. On the 13th of July the Engliſh weighed anchor, and whilſt they were proceeding on their voyage, Tupia informed lieutenant Cook that at four of the neighbouring iſlands, which he diſtinguiſhed by the names of *Huaheine*, *Ulietea*, *Otaha*, and *Bolabola*, they might procure hogs, fowls, and other refreſhments, in great abundance. Accordingly, having paſſed *Tethuroa*, they approached the N.W. part of Huaheine on the 16th of July, and in the afternoon anchored in a ſmall but excellent harbour on the W. ſide of the iſland, called Owharre; and having procured a variety of neceſſary articles of refreſhment, they ſailed on the 19th for Ulietea, in a good harbour of which the ſhip anchored on the next day.

The lieutenant hoiſted an Engliſh jack on this iſland, and, in the name of his Britannic majeſty, took poſſeſſion of this, and the three neighbouring iſlands, Huaheine, Otaha, and Bolabola, all of which were in ſight. The harbour or bay in which the Endeavour had anchored was called by the native Oopoa, and extends almoſt the whole length of the eaſt ſide of the iſland. In its greateſt extent it is capable of accommodating any number of ſhips. After having ſurveyed the northern and ſouthern parts of this iſland, they ſet ſail on the 24th; but after encountering conſiderable danger and diſcovering ſeveral ſmall iſlands, they returned to Ulietea, and caſt anchor on the 1ſt of Auguſt in a harbour on the weſt ſide of the iſland. Tupia had previouſly apprized them of the formidable character of the inhabitants of Bolabola, but on intercourſe with them, and particularly with Opoony, they found there was no foundation for the terrors which Tupia had endeavoured to excite. Having finiſhed their neceſſary repairs, and obtained a freſh ſtock of proviſions, they prepared for leaving the iſland. The principal iſlands, about which the Engliſh had now ſpent ſomewhat more than three weeks, were ſix in number; viz. *Ulietea*, *Otaha*, *Bolabola*, *Huaheine*, *Tubai*, and *Maurua*; which ſee reſpectively. Our voyagers purſued their courſe till the 13th; when land was diſcovered bearing S.E., and which Tupia informed them was an iſland called *Oheteroa*. As the inhabitants manifeſted a hoſtile diſpoſition, lieutenant Cook, with equal wiſdom and humanity, made no attempt for landing. By Tupia our navigators were informed, that various iſlands lay at different diſtances, and in different directions from Oheteroa, between the ſouth and the north-weſt; and that to the north-eaſt there was an iſland called Manua, or Bird iſland. He alſo deſcribed ſeveral iſlands towards the weſt; probably Boſcawen and Keppel's iſlands, which had been diſcovered by Captain Wallis. The fartheſt iſland towards the ſouth, of which Tupia had any knowledge, was called *Moutou*, about three days ſail from Oheteroa. But his father, he ſaid, had informed him, that there were other iſlands farther to the ſouth. Lieutenant Cook determined, all circumſtances duly conſidered, to ſtand ſouthward in ſearch of a continent. On the 15th of Auguſt, our voyagers ſailed from Oheteroa, and on the 30th, in lat. 38° 20'. W. long. 147° 6', they obſerved a comet, the tail of which ſubtended an angle of 42 degrees. On the 6th of October they diſcovered an extenſive tract of land, which they at firſt conceived to be the "Terra Auſtralis incognita," but which proved, in the event, to be a part of New Zealand. Lieutenant Cook, having anchored, on the 8th, in a bay, at the entrance of a ſmall river, went on ſhore, accompanied by Mr. Banks and Dr. Solander, and attended with a party of men, in order to have ſome intercourſe with the natives. They aſſumed a very hoſtile appearance; and made attempts for running away with the pinnace, which had been left at the entrance of the river. On the next day they exhibited the ſame formidable aſpect, brandiſhing their pikes and lances. Tupia addreſſed them in a language, which was a dialect of their own and which they underſtood; informing them that our voyagers only wanted proviſions and water, in exchange for iron, the properties of which he explained as far as he was able. Their intentions, however, appeared to be unfriendly; and on the iron and beads, which were preſented to them, they ſeemed to ſet little value. Tupia told them at length, that if they proceeded to any farther violence, ſome of them muſt fall victims to the juſt retaliation of the Engliſh. This ſalutary counſel, however, produced no effect; and ſome were killed, and ſeveral wounded in the conflict that enſued. The ſeverity exerciſed on this occaſion, was very different from the conduct which Mr. Cook's prudence and humanity ſuggeſted in other caſes; and, on a calm review, it was not approved by himſelf; but he pleaded the nature of the ſervice in which he was employed and the neceſſity of obtaining a knowledge of the country, which he had previouſly attempted to acquire by kind treatment, and with a view to which he was at length obliged to recur to hoſtile and fatal meaſures. The lieutenant finding all his efforts to eſtabliſh an intercourſe with the natives unavailing, determined to re-embark, and on the 11th of the month he left this inhoſpitable place, which, as it had ſupplied him with no article except wood, he denominated *Poverty-bay*, called by the natives *Taoneróa*, or Long Sand, and ſituated in S. lat. 38° 42′, and W. long. 181° 36′. In this courſe he ſpent nearly ſix months, and made large additions to the knowledge of geography and navigation. By making the whole circuit of New Zealand, he aſcertained it to conſiſt of two iſlands. While the ſhip was hauling to the ſouth end of a ſmall iſland, called *Teahowary* by the natives, and by the lieutenant "Portland iſland," it ſuddenly fell into ſhoal water and broken ground. The inhabitants, perceiving its diſtreſs, put off in five canoes, and aſſumed a very formidable and menacing aſpect, and ſeemed to be prepared for action; and it was to little purpoſe that guns were fired in order to intimidate them. Whilſt ſome kind of traffic was carrying on with one of the canoes, Tupia's boy, who was ſtanding on the ſide of the ſhip, was ſeized by one of the New Zealanders, and carried off. Upon this atrocious act the marines were ordered to fire; and during the confuſion that enſued, the boy made his eſcape and ſwam to the ſhip; though he was purſued by the largeſt of the canoes. To the cape where this unhappy tranſaction occurred, Mr. Cook gave the name of "Cape Kidnappers;" it lies in S. lat. 39° 43′. W. long. 182° 24′. Between this cape and the iſland Portland is a bay, which, in honour of ſir Edward Hawke, the lieutenant called "Hawke's bay." While, on the 18th, the Endeavour lay a-breaſt of a peninſula within Portland iſland, called *Terakako*, two of the natives, ſuppoſed to be their chiefs, confided ſo far in Mr. Cook, as to venture on board the ſhip, and remained there all night, their canoe being hoiſted into the ſhip. On the 23d, while the ſhip was in *Tegadoo* bay, lieutenant Cook went on ſhore to examine the watering places, and found the water excellent and conveniently ſituated, and the diſpoſition of the people much more favourable than he expected. This lay in S. lat. 38° 22′ 24″, and W. long. 180° 47′. Here they ſupplied themſelves with as much wood and water as they wanted. On the 28th, ſome gentlemen of the Endeavour went on ſhore on an iſland which lies to the left hand of the entrance of Tolaga bay; and there ſaw the largeſt canoe which they had yet obſerved; her length being 68½ feet, her breadth 5 feet, and her height 3 feet 6 inches. While the ſhip was in Hicks's bay, the inhabitants of the adjoining coaſt were found to be very hoſtile. Early on the 1ſt of November, they counted 45 canoes coming from the ſhore towards the Endeavour, and ſeveral others following them from another place. Some of the Indians traded fairly; others added deriſion and inſolence to fraud; and though ſeveral ſmall ſhot were fired at them, the canoes merely dropped a-ſtern, and ſet up their ſong of defiance as they departed from the ſhip. In ſtanding weſtward from a ſmall iſland called *Mowtohora*, the Endeavour encountered ſome danger amidſt the adjacent rocks, but at length it eſcaped without injury near an iſland called by the lieutenant the *Mayor;* the inhabitants of the neighbouring coaſt diſplayed in many inſtances their hoſtility, and, in their traffic with our navigators, committed various acts of fraud and robbery. Here, *viz.* in S. lat. 36° 48′ 5½″, lieutenant Cook and Mr. Green made an obſervation of the tranſit of Mercury. In the mean while the ſhip was viſited by two large canoes, one of which indicated hoſtile intentions on the part of its crew. In the courſe of their traffic, they were guilty of an act of fraud, accompanied with menaces and defiance, which induced Mr. Gore to fire at the offender and to kill him. At length, however, in conſequence of ſmall ſhot fired over their heads, they all fled with the utmoſt precipitation. On the 10th, our commander, accompanied by Mr. Banks, and the other gentlemen, examined a large river that empties itſelf into the head of Mercury bay, and found the ſituation abounding with conveniences, capable of an eaſy defence, and furniſhing beds of excellent oyſters; this river Mr. Cook called Oyſter river. On the 15th he ſailed out of "Mercury bay," ſo called in conſequence of the obſerved tranſit of Mercury over the ſun, and lying in S. lat. 36° 47′. W. long. 184° 4′. Another river lies at the head of the bay, which is the beſt or ſafeſt place for a ſhip that wants to ſtay for any length of time. This the lieutenant, obſerving a number of Mangroves about it, called "Mangrove river." Before the Endeavour left the bay, Mr. Cook, having diſplayed the Engliſh colours, took formal poſſeſſion of the place in the name of his Britannic majeſty, king George III. In the range from Mercury bay ſeveral canoes appeared apparently for hoſtile purpoſes; but their occupiers were inſtantly diſperſed by a muſket ball, fired through one of their boats; although Tupia's oratory had proved ineffectual. While Mr. Cook remained in the "Bay of iſlands," he took occaſion to examine the interior part of the country and its produce. Some circumſtances occurred which produced diſagreement between the navigators and the inhabitants, and it required ſingular exertions of prudence, as well as of humanity on the part of Mr. Cook, to bring them to a termination. The number of inhabitants in the Bay of iſlands was found to be much greater than in any other part of New Zealand which the commander had hitherto viſited; and though they did not appear to be united under one head, and though their towns were fortified, they ſeemed to live together in perfect amity. The Endeavour on the 9th of December, lying becalmed in "Doubtleſs bay," an opportunity offered for making inquiries among the natives concerning their country; and Tupia enabled the lieutenant to learn, that at ſome diſtance, at a place called "Moore-whennua," the land would take a ſhort turn to the ſouthward, and thence extend no more to the weſt. This place the Engliſh gentlemen concluded to be the land diſcovered by Taſman, and which he had named "Cape Maria Van Diemen." The inhabitants, who ſeemed to be intelligent, farther informed them, that there was a country of great extent, to the N.W. by N. or N.N.W., called *Ulimaroa,* where it was underſtood that the people eat hogs. Our navigators, on the 30th of December, ſaw the land, which they judged to be "Cape Maria Van Diemen," and which correſponded with the account given of it by the Indians. The next day, they had demonſtrative evidence, from the appearance of mount Carmel, that, where they now were, the breadth of New Zealand could not be more than two or three miles from ſea to ſea. During this part of the navigation, they encountered, in S. lat. 35°, and in the midſt of ſummer, a long-continued and violent gale of wind; but as they were at a conſiderable diſtance from the land, they eſcaped the danger that alarmed them. The ſhore at "Queen Charlotte's Sound," where the Engliſh had arrived on the 14th of January, 1770, ſeemed to form ſeveral bays, into one of which lieutenant Cook propoſed to take the ſhip for neceſſary repairs, and for obtaining a recruit of wood and water, of which they were ſupplied with great plenty. On landing they found an Indian family, in which they found horrid and indiſputable proofs of the cuſtom of eating human fleſh. Evidences of the ſame cuſtom appeared likewiſe on ſeveral other occaſions. Whilſt they were near this part of the country, they were entertained with the moſt enchanting melody of birds, who began their ſong about two hours after midnight and continued it till ſun-riſe; thus reſembling the nightingales of our own country. Lieutenant Cook, upon aſcending one of the hills of the country, had a view of the ſea on the eaſtern ſide of it, and of a paſſage leading from it to that of the weſt, a little eaſt of the inlet where the ſhip lay. The main land, S.E. of this inlet, appeared to be a narrow ridge of very high hills, forming part of the S.W. ſide of the ſtrait. On the oppoſite ſide, the land trended away E. as far as the eye could reach; and to the S.E. was diſcovered an opening to the ſea, which waſhed the eaſtern coaſt. The lieutenant ſaw, alſo, on the E. ſide of the inlet, ſome iſlands which he had before taken to be part of the main land. In returning to the ſhip, he examined the harbour and coves that lie behind the iſlands which he had ſeen from the hills; and he employed the next day in farther ſurveys and diſcoveries:—the gentlemen of the ſhip alſo accompanied him in viſiting a town, which was built upon a ſmall iſland or rock, very difficult of acceſs, and which conſiſted of between 80 and 100 houſes; the inhabitants of which were very friendly and attentive, and furniſhed them with a large quantity of dried fiſh. From a hill of conſiderable height, which afforded a view of the coaſt to the N.W., the fartheſt land that appeared was an iſland at the diſtance of about 10 leagues, lying not far from the main; between this iſland and the place where the commander ſtood, he diſcovered, cloſe under the ſhore, ſeveral other iſlands, forming many bays, in which there appeared to be good anchorage for ſhipping. On the 30th of January the inlet where our voyagers now lay was named "Queen Charlotte's Sound," and a memorial was erected of their viſit to this place. At the ſame time Mr. Cook took formal poſſeſſion of this and the adjacent country in the name of king George III.; thus precluding the claims of future navigators, but reſerving to the original inhabitants their natural rights. On Monday, the 5th of February, the Endeavour, after encountering a violent ſtorm, got under ſail; but was ſoon obliged to come to an anchor a little above Motuara. Upon inquiring he learnt that there was a diſtant country, towards the north, called *Ulimaroa*; but he could obtain no farther particulars. Lieutenant Cook, on the 6th of February, got out of the Sound, and in the evening ſaw two ſmall iſlands, lying off "Cape Koamaroo," at the S.E. head of Queen Charlotte's Sound, and bearing E. at the diſtance of about four miles. The rapidity of the ſtream, occaſioned by the tide of ebb, endangered the ſhip, and it was reſcued by ſome favourable incidents; the narroweſt part of the ſtrait through which it was rapidly driven, lies between "Cape Tieravite," on the coaſt of the iſland of *Eaheinomauwe*, and "Cape Koamaroo;" the diſtance between them being eſtimated at four or five leagues. During Mr. Cook's long and minute examination of the coaſt of New Zealand, he gave names to the bays, capes, promontories, iſlands, and rivers, and other places which he ſaw or viſited; excepting in inſtances where their original appellations were learned from the natives. After having aſcertained New Zealand to be an iſland, Mr. Cook wiſhed to extend his acquaintance with the country. He completed his circumnavigation, by ranging from "Cape Turnagain," ſouthward along the eaſtern coaſt of *Poenammoo*, round "Cape South," and back to the weſtern entrance of the ſtrait which he had paſſed, and which has been very properly called Cook's *Strait*; which ſee. In this range an iſland, lying about five leagues from the coaſt of *Tovy-Poenammoo*, was diſcovered, and it was named "Banks's iſland." Lieutenant Cook, purſuing his courſe to the ſouthward, wiſhed to aſcertain, whether Poenammoo was an iſland or a continent. In the proſecution of this object he paſſed ſome dangerous rocks on the 9th of March, and on the ſame day reached a point of land called "South Cape," in S. lat. 47° 19'. W. long. 192° 12', which proved to be the ſouthern extremity of the country. On the 14th the Endeavour paſſed a ſmall narrow opening in the land, where was a ſafe and convenient harbour, formed by an iſland, which lay eaſtward in the middle of the opening. On the land behind this opening are mountains, the ſummits of which were covered with ſnow, that had recently fallen. The land on each ſide of the entrance of the opening, riſes almoſt perpendicularly from the ſea to a ſtupendous height: and, on this account lieutenant Cook did not chuſe to take the ſhip into the harbour. Before the 27th of March, the commander had circumnavigated the whole country of Tovy-Poenammoo, and arrived within ſight of the iſland before mentioned, lying nine leagues from the entrance into Queen Charlotte's Sound. With a view of obtaining a ſupply of water, he hauled round the iſland, and entered a bay, ſituated between that and Queen Charlotte's Sound, to which was given the name of *Admiralty-bay*; which ſee. Lieutenant Cook now directed his views towards Europe; and it was determined to return by the Eaſt Indies. In purſuance of this reſolution, it was propoſed that they ſhould ſteer eaſtward till they ſhould fall in with the eaſt coaſt of New Holland, and then follow the direction of that coaſt towards the north, till they ſhould arrive at its northern extremity. If that ſhould be found impracticable, it was farther reſolved that they ſhould endeavour to fall in with the land, or iſlands, ſaid to have been diſcovered by Quiros. For a farther account of *New* ZEALAND; ſee that article.

On the 31ſt of March our commander ſailed from "Cape Farewell" in New Zealand, S. lat. 40° 53'. W. long. 18°, and purſued his voyage towards the weſt. On the 19th of April "New Holland," or as it is now called, "New South Wales," came in ſight; and on the 28th, the ſhip anchored in *Botany-bay*; which ſee. During Mr. Cook's ſtay at this place, he cauſed the Engliſh colours to be diſplayed every day on ſhore, and took care that the ſhip's name, and the date of the year, ſhould be inſcribed on one of the trees near the watering-place. On the 6th of May our navigators ſailed from this bay; and in their farther progreſs lieutenant Cook gave the names marked upon the map to the bays, capes, points, and remarkable hills that appeared ſucceſſively in ſight. On the 14th, as the Endeavour advanced to the northward, being then in S. lat. 30° 22'. W. long. 206° 39', the land gradually roſe in height, ſo that it may be called a hilly country. Between this latitude and Botany-bay, it exhibits a pleaſing variety of ridges, hills, valleys, and plains, clothed with wood. On the 17th our navigators were in a bay called "Moreton's bay," S. lat. 26° 56′. W. long. 206° 28′; and from appearances they concluded that this bay opened into a river; but they had not then leiſure to aſcertain the fact. On the 22d, as they were purſuing their voyage from "Harvey's bay," they diſcovered that the land was covered with palm nut-trees, which they had not ſeen from the time of their leaving the iſlands within the tropic. Early in the next day they went on ſhore, in order to examine the country, and found a channel leading into a large lagoon. Here they diſcovered a ſmall river of freſh water, and room for a few ſhips to lie in great ſecurity. Near the lagoon grows the true Mangrove, ſuch as exiſts in the Weſt India iſlands, and the firſt of the kind that had been met with by our navigators. Among the iſlands and ſhoals they ſaw many large birds, which they judged to be pelicans, and on the ſhore a ſpecies of buſtard of a conſiderable ſize and excellent food; ſo that in honour of it they called the inlet *Buſtard-bay*. S. lat. 24° 4′. W. long. 208° 18′. Here they found a number of ſmall pearl-oyſters, among others of various kinds; ſo that Mr. Cook was of opinion, that an advantageous pearl-fiſhery might be eſtabliſhed in this place. On the 25th our voyagers, at the diſtance of one mile from the land, were a-breaſt of the point which Mr. Cook found to lie directly under the tropic of Capricorn, in W. long. 208° 58′, and he therefore called it "Cape Capricorn." On the 26th the ſhip, being under ſail, was ſurrounded with iſlands, which lay at different diſtances from the main land; and here Mr. Banks, in fiſhing, took two ſorts of crabs, ſuch as had not been ſeen before; one of them was adorned with a moſt beautiful blue, equal to the ultramarine, which tinged all his claws and joints, while the under part was white and highly poliſhed; the other was marked with ultramarine, more ſparingly, on his joints and toes, and on his back were three brown ſpots of a ſingular appearance. Lieutenant Cook finding a paſſage between the iſlands, ſailed to the northward, and anchored at about two miles diſtance from the main. A great number of iſlands were within ſight. Here Mr. Cook obſerving that the tide ebbed and flowed conſiderably, when the ſhip had anchored within the inlet, concluded that it was a river that might run pretty far up into the land. Our voyagers having gratified their curioſity with a variety of objects, but being diſappointed in their wiſhes of obtaining freſh water, determined to make a ſhort ſtay in this place. Before they left it, however, they were deſirous of more particularly examining the inlet, in which the ſhip lay; its breadth was found to be from two to five miles, upon a direction S. W. by S.; but here it opened every way, and formed a large lake, which to the N.W. communicated with the ſea. On the ſouth ſide of the lake was a ridge of hills; and various appearances indicated that the country was inhabited. The country, in general, in this part of New South Wales, appeared ſandy and barren, and deſtitute of the accommodations which would fit it for being poſſeſſed by ſettled inhabitants. This inlet, from its want of freſh water, was called by Mr. Cook "Thirſty Sound." S. lat. 22° 20′. W. long. 210° 18′. On the 31ſt our voyagers left the place and proceeded, till on the 7th of June they perceived on one of the iſlands, which they were paſſing, the appearance of cocoa-nut trees; but upon examination, theſe were miſtaken for a ſmall kind of cabbage-palm. On the 8th, when the Endeavour was in the midſt of a cluſter of ſmall iſlands, our navigators diſcerned, with their glaſſes, upon one of the neareſt of them, about 30 of the natives, men, women, and children, ſtanding together and attentively looking at the ſhip. This was the firſt inſtance of curioſity that had been obſerved among the people of the country. They were wholly naked; their hair was ſhort, and their complexion reſembled that of the other inhabitants that had been before obſerved. In navigating the coaſt of New South Wales, for an extent of 22 degrees of latitude, or more than 1300 miles, lieutenant Cook had conducted his veſſel in ſafety; but on the 10th of June, as he was purſuing his courſe from a bay, which he had called "Trinity bay," the Endeavour fell into a ſituation peculiarly critical and dangerous; having been lifted over a ledge of rock, and lying in a hollow within it. Her ſheathing boards were obſerved by the light of the moon to be floating away from her, and at laſt her falſe keel, ſo that every moment it was expected the whole company would be ſwallowed up by the ruſhing in of the ſea. The ſhip was expeditiouſly lightened as much as poſſible, and every exertion was made without murmur and with the greateſt alacrity to eſcape the imminent peril to which their lives were expoſed. So ſenſible were the ſailors of the awfulneſs of their ſituation, that not an oath was heard among them. When morning dawned upon them they had a clearer view of their danger. Providentially, however, it became a dead calm, and high water came on at eleven in the morning: but it was neceſſary ſtill further to lighten the ſhip, and two pumps were inſtantly worked to diſcharge the water that ruſhed in. For the tide at midnight they waited with anxious and awful expectation: in the mean while the leak increaſed to a very alarming degree; and though the ſhip righted, it was expected that ſhe muſt go to the bottom as ſoon as ſhe ceaſed to be ſupported by the rock. The floating of the ſhip, which in other circumſtances, would have been the means of their ſalvation, was in their ſituation, a ground of ſerious alarm; becauſe it might precipitate their deſtruction. Their poſſibility of eſcape was precarious, if the ſhip ſunk; and the coaſt on which they were to be thrown, if any of them eſcaped, was inhabited by naked ſavages, from whoſe compaſſion they might derive no relief. The deciſive moment at length arrived; and the ſhip was heaved into deep water, without admitting more water than when ſhe lay upon the rock. The men had experienced long anxiety and were ſinking with fatigue; and in an exhauſted ſtate they threw themſelves upon the deck, and after ſhort intervals and pauſes of reſt, renewed their laborious and almoſt fruitleſs exertion; for the leak gained upon the pumps. In this ſtate of anxiety and labour, an accident occurred, which had almoſt terminated, at once, all their efforts. The planking which lines the ſhip's bottom is called the cieling; between which and the outſide planking there is a ſpace of about eighteen inches. From this cieling only, the man who had attended the well had taken the depth of the water, and had given the meaſure accordingly. But the perſon, who relieved him, meaſured the depth to the outſide planking, which had the appearance of the leak's having gained upon the pumps eighteen inches in a few minutes. The miſtake, however, was ſoon detected; and this accident, at firſt ſo alarming, became, in the event, highly advantageous. New hopes, from a diſcovery that their ſituation was not ſo dangerous as they apprehended, inſpired new vigour; and before eight in the morning the pumps gained conſiderably on the leak. At eleven o'clock the Endeavour was once more under ſail, and ſtood for the land. They wiſhed, however, to ſtop the leak; and Mr. Monkhouſe, one of the midſhipmen, propoſed to the commander an expedient which had preſerved a merchant ſhip, which had ſprung a leak that admitted more than four feet water in an hour. This was called *fothering* the ſhip. (See Fothering.)

The expedient ſucceeded; and it was owing partly to a fragment of rock, which had filled up one of the holes of the ſhip, that ſhe did not ſink and involve her whole company in inevitable deſtruction. In conſequence of the diſtreſs experienced by the whole crew on this occaſion, lieutenant Cook called a point in ſight, which lay to the northward, in S. lat. 16° 6′. W. long. 214° 39′, "Cape Tribulation." On the 14th a ſmall harbour was diſcovered, excellently adapted for repairing the damage which the ſhip had ſuſtained. Another alarming circumſtance, which occurred at this time, was the acceſs of the ſcurvy, that began to make its appearance among the ſhip's company, and that rendered it ſtill more neceſſary to get on ſhore. On the 17th the ſhip put in for the harbour, the entrance of which was a narrow channel. Tents were erected for the accommodation of the ſick; and all of them, except Mr. Green, manifeſted ſymptoms of recovery. On the 29th of June an emerſion of Jupiter's firſt ſatellite was obſerved, from which they obtained the longitude of the place 214° 42′ 30″ W., its latitude being 15° 26′ S. A plan of the harbour was taken; and Mr. Cook aſcended a hill, from which he obſerved, to his great concern, innumerable ſandbanks and ſhoals, lying in every direction of the coaſt. To the northward there was the appearance of a paſſage, by which lieutenant Cook had the only chance of getting clear, in the proſecution of his voyage. By a large ſupply of fiſh, he was able to diſtribute 2½ pounds to each man; a quantity of greens, being procured, were boiled with the peas: and by theſe means the ſhip's company obtained a very conſiderable refreſhment. On the 2d of July our lieutenant ſent the maſter out of the harbour, to ſound about the ſhores, and to ſearch for a paſſage to the northward. In a ſubſequent inveſtigation, a paſſage to the ſea was diſcovered between the ſhoals, which conſiſted of coral rocks, and which had furniſhed cockles of an enormous ſize, inſomuch that one of them was more than ſufficient for two men. Other ſhell-fiſh were alſo found in great abundance. At high water the ſhip floated; but a leak having been diſcovered, it was neceſſary to lay her aſhore a ſecond time. The ſeveral damages being repaired, the ſhip was again floated at high water, and preparations were made for proceeding on the voyage. To this harbour Mr. Cook gave the name of "Endeavour river." The maſter, having been diſpatched to re-examine the paſſage, which he had before diſcovered, reported that he had been miſtaken. In the mean while, the inhabitants of the country, who had been very reſerved in holding any intercourſe with the navigators, became more familiar, in conſequence of the commander's prudent management. Here they diſcovered an animal, called by the natives *kanguroo*, which, being dreſſed, proved to be excellent meat; and they were alſo furniſhed with great plenty of turtle, ſuperior to any which the gentlemen ever taſted in England. The turtle was of the ſpecies called green turtle, and they weighed from two to three hundred pounds. The inland country was agreeably diverſified by hills, valleys, and large plains, which in many places were richly covered with wood. The longitude of their ſtation, determined by an obſervation of the emerſion of Jupiter's firſt ſatellite, July the 16th, was 214° 53′ 45″; that on the 29th of June had given 214° 48′ 30″, the mean of which was 214° 48′ 7½″ W. The Indians were very hoſtile and fraudulent; and ſo daring and inſolent, that nothing would diſperſe them but ſmall ſhot repeatedly fired from the muſkets. In order to incommode our navigators, they ſet fire to the graſs, which blazed in various directions. On the 4th of Auguſt, after frequent unſucceſsful attempts to diſengage the ſhip from the harbour, ſhe got under ſail; but many difficulties occurred; and on the 5th, the lieutenant had not kept his courſe long before ſhoals were diſcovered in every quarter, which obliged him, at the approach of night, to come to an anchor. On the morning of the 10th, the weather, which had been boiſterous, became more moderate, and the commander weighed anchor, and ſtood in for the land; determining to ſeek a paſſage along the ſhore to the northward. In purſuance of this reſolution, the Endeavour proceeded in her courſe, and at noon came between the farthermoſt head-land that lay in ſight, and three iſlands which were four or five leagues to the north of it, out at ſea. Here they thought there was a clear opening before them, and began to hope that they were once more out of danger. In this hope, however, they were ſoon diſappointed, and therefore the lieutenant gave to the head-land, in S. lat. 14° 56′. W. long. 214° 43′, the name of "Cape Flattery." After ſteering for ſome time along the ſhore, for what was believed to be the open channel, an officer at the maſt-head cried aloud that he ſaw land a-head, which extended quite round to the three iſlands; and that between the ſhip and them there was a large reef. Mr. Cook himſelf diſcerned the reef, but was of opinion that the ſuppoſed land was a cluſter of ſmall iſlands. In this ſtate of uncertainty, however, he thought it moſt prudent to come to anchor, under a high point, from which he could have an extenſive view of the ſea and country. This eminence he called "Point Look-out." In the proceſs of inveſtigating the ſhoals and channel between them, the lieutenant, accompanied by Mr. Banks, diſcovered an iſland on which were no animals except lizards; and he therefore called it "Lizard iſland." In their return to the ſhip, they landed on a low ſandy iſland, abounding with an incredible number of birds; and as they here found the neſt of an eagle, they called it "Eagle iſland." At length, after much deliberation, it was reſolved to quit the coaſt entirely, till they could approach it with leſs danger; and in purſuance of this reſolution, the Endeavour, on the 13th, got under ſail, and ſucceſsfully paſſed through one of the channels or openings in the outer reef, which Mr. Cook had previouſly obſerved. The ſituation of our navigators was now happily changed; and after three months' anxiety and ſuſpence, they found themſelves in an open ſea, with deep water. The paſſage or channel, through which the Endeavour paſſed into the open ſea beyond the reef, lies in S. lat. 14° 32′. It is diſtinguiſhed by the three high iſlands within it, to which, on account of the uſe they may be of in guiding the way of future voyagers, our commander gave the appellation of "Iſlands of Direction." New dangers, which created alarm and required freſh exertions, occurred; but every man did his duty with as much calmneſs and regularity as if no danger had been near. It was indeed the high and magnanimous ſpirit of the commander, which inſpired his people with ſuch reſolution and vigour. On the coaſt of a new and unknown country he braved all perils, and determined to aſcertain whether this country did, or did not, join to New Guinea: a queſtion which he had fixed upon reſolving, from the firſt moment that he had come within ſight of land. To the opening, through which he had paſſed with ſo much hazard, the commander, under a proper ſenſe of gratitude to the Supreme Being, gave the name of "Providential channel." In the proſecution of the voyage, the navigators, on the 19th, were encompaſſed on every ſide with rocks and ſhoals; but they were little moved, as perils had been familiar to them. On the 21ſt, as no land could be ſeen, they conceived hopes of having at laſt found a paſſage into the Indian ſea; but to determine this matter with greater certainty, lieutenant Cook reſolved to land upon an iſland, which lies in the S.E. point of the paſſage. Accordingly he, accompanied by Mr. Banks and Dr. Solander, aſcended a high hill, from which no land could be ſeen between the S.W. and W.S.W.; ſo that Mr. Cook had not the leaſt doubt of finding a channel, through which he might paſs to New Guinea. As he was now about to quit the coaſt of New Holland, which he had traced from lat. 38° to this place, and where he was certain no European had ever been before, he once more hoiſted Engliſh colours, taking poſſeſſion of the whole eaſtern coaſt, with all the bays, harbours, rivers, and iſlands ſituated upon it, from lat. 38° to lat. 10½° S. in right of his majeſty king George III., and by the name of *New South Wales*. Having performed this ceremony upon the iſland, hence called "Poſſeſſion iſland," they reimbarked in their boat; and on the 23d Mr. Cook was confirmed by ſeveral circumſtances in his opinion, that he had arrived to the northern extremity of New Holland, and that to the weſtward he had an open ſea. Theſe circumſtances afforded him peculiar ſatisfaction, not only becauſe the dangers and fatigues of the voyage were drawing to a concluſion, but becauſe it could no longer be doubted whether New Holland or New Guinea were two ſeparate iſlands. The N.E. entrance of the third lies in S. lat. 10° 39′. W. long. 218° 36′; and the paſſage is formed by the main land, and by a congeries of iſlands to the N.W., called by Mr. Cook the "Prince of Wales's iſlands," and which may probably extend as far as to New Guinea. To the channel through which he paſſed, he gave the name of "Endeavour ſtraits."

From the coaſt of New South Wales, the lieutenant ſteered, on the 23d of Auguſt, for the coaſt of New Guinea; but in the proſecution of his voyage he fell upon a dangerous ſhoal, which expoſed him to great danger; but he fortunately eſcaped; and on the 3d of September arrived within ſight of New Guinea, and brought to within three or four miles of land. Some of the ſhip's company went on ſhore, but they were ſuddenly attacked by the natives, who had for ſome time concealed themſelves in the woods. See New Guinea. Our voyagers leaving this coaſt, haſtened to the weſtward; and purſuing their courſe, they diſcovered on the 6th of September a ſmall iſland N.N.W.; and another low iſland, extending from that quarter to N.N.E. Unleſs theſe two iſlands belong to the "Arrou iſlands," they have no place in the charts; and if they do belong to theſe, they are laid down at too great a diſtance from New Guinea. Mr. Cook found the E. part of them in S. lat. 7° 6′. W. long. 225°. On the 7th, when the ſhip was in S. lat. 9° 30′, and W. long. 229° 34′, our navigators ought to have been in the ſight of the Weaſel iſles, which are laid down in the charts at the diſtance of 20 or 25 leagues from the coaſt of New Holland; but Mr. Cook, as he did not ſee them, concluded that they muſt have been laid down erroneouſly. In purſuing their courſe, our navigators paſſed the iſlands of Timor, Timor-lavet, Rotle, and Seman. When they were near theſe two latter iſlands they obſerved a phenomenon in the heavens, in ſome reſpects reſembling, but in others differing from, the Aurora Borealis. Having paſſed all the iſlands between Timor and Java, lieutenant Cook did not expect to meet with any other in that quarter; but on the 17th he obſerved an iſland bearing W.S.W., which he thought to be a new diſcovery. When they came to the N. ſide of it, they ſaw houſes and cocoa-nut trees, and numerous flocks of ſheep. Here they landed; the commander thinking he might thus ſupply the neceſſities of the ſhip's company, and remove both the ſickneſs and the diſcontent which had ſpread among them. This proved to be the iſland of Savu; which ſee. On the 21ſt of September our navigators left Savu, and on the 1ſt of October came within ſight of the iſland of Java; and on the 9th they ſtood in for Batavia road, where the Endeavour was ſecured from a ſtroke of lightning by the chain that was attached to it. The injurious effects of this climate were felt by our voyagers within nine days after their arrival; and Mr. Monkhouſe, the ſurgeon of the ſhip, fell, on the 5th of November, the firſt ſacrifice to this fatal country. Tayeto, Tupia's boy, died the 9th, and Tupia ſurvived him only a few days. The repair of the Endeavour, which had been very much damaged, and which appeared to be in a very alarming ſtate, was an object to which Mr. Cook, though himſelf affected by the climate, directed his particular attention, and it was performed much to his ſatisfaction. When this buſineſs was accompliſhed, on the 27th of December, the ſhip ſtood out to ſea; and on the 5th of January 1771, came to an anchor under the S.E. ſide of "Prince's iſland," where the gentlemen of the ſhip, after having paid their reſpects to the king, commenced a traffic with the natives for turtles, fowls, fiſh, monkies, ſmall deer, and vegetables. On the 15th the commander weighed, and ſtood out for ſea. In the proſecution of the voyage to the Cape of Good Hope, the ſeeds of diſeaſe, which had been received at Batavia, appeared with very threatening ſymptoms, and reduced the navigators to a very melancholy ſituation. The ſhip was a mere hoſpital; the water taken in at Prince's iſland was purified with lime; and in order farther to guard againſt infection, the commander ordered all the parts of the veſſel between the decks to be waſhed with vinegar. So fatal, notwithſtanding every precaution, was the diſeaſe, that almoſt every night a dead body was committed to the ſea. The loſs amounted in all to 23 perſons, beſides the ſeven who died at Batavia. Among theſe were Mr. Green the aſtronomer, Mr. Parkinſon, natural hiſtory painter, Mr. Monkhouſe the midſhipman, another midſhipman, &c. &c. Theſe calamitous events contributed moſt probably to turn the attention of Mr. Cook to thoſe methods of preſerving the health of ſeamen, which he afterwards purſued with ſuch remarkable ſucceſs. On the 15th of March the Endeavour arrived off the Cape of Good Hope; and a proper place was provided on ſhore for the accommodation and recovery of the ſick. Lieutenant Cook having ſtaid here whilſt the ſick of his crew were recovered, neceſſary ſtores were procured, and the veſſel refitted, till the 14th of April, ſtood out of the bay, and proceeded on his voyage homeward. In the morning of the 29th, he croſſed his firſt meridian, having circumnavigated the globe in the direction from eaſt to weſt; the conſequence of which was that he had loſt a day, an allowance for which had been made at Batavia. On the 1ſt of May he arrived at St. Helena, and on the 4th he departed from this iſland, and purſued his courſe in ſafety. On the 10th of June, land, which proved to be the Lizard, was diſcovered; on the 11th the ſhip ran up the channel; next morning he paſſed Beachy head; and in the afternoon of the ſame day anchored in the Downs, and went on ſhore at Deal. Thus ended Mr. Cook's firſt voyage round the world, in which he had gone through ſo many dangers, explored ſo many countries, and exhibited the ſtrongeſt proofs of his poſſeſſing an eminently ſagacious and active mind; a mind that was equal to every perilous enterpriſe, and to the boldeſt and moſt ſucceſsful efforts of navigation and diſcovery.

Mr. Cook having thus recommended himſelf to the protection of government, and the favour of his ſovereign, was promoted in the progreſſive order of the naval ſervice, to be a commander in his majeſty's navy, Aug. 29, 1771;

1771; an officer inferior in rank only, but equal in advantage to that of poſt-captain. On the 21ſt of May 1772, captain Cook communicated to the Royal Society by a letter to Dr. Maſkelyne, "An Account of the flowing of the Tides in the South Sea, &c." (ſee Phil. Tranſ. vol. lxii. p. 357-8.) The curioſity of the public was much excited by the reports of lieutenant Cook's voyage; and it was amply gratified by Dr. Hawkeſworth's Account, in 3 vols. 4to. Extenſive and intereſting was the knowledge obtained in conſequence of this voyage; but the queſtion concerning a ſouthern continent remained ſtill undecided. The reign of our preſent ſovereign George III. has been favourable to every kind of ſcientific and literary inquiry; and the earl of Sandwich, who, at the period to which we now refer, was at the head of the admiralty, was eminently capable of comprehending and diſpoſed alſo to encourage the moſt enlarged views and ſchemes with regard to navigation and diſcovery. By his particular recommendation, it was reſolved to appoint a commiſſion for determining the long diſputed queſtion relating to the exiſtence of a ſouthern continent. Quiros ſeems to have been the firſt perſon who ſuggeſted the idea of ſuch a continent; but though he was ſent out to aſcertain it, he failed in the attempt. Mr. Dalrymple had now excited the public attention to this object, by his Hiſtorical Collection, in 2 vols. 4to. of the ſeveral voyages and diſcoveries in the ſouth Pacific Ocean, 1770, 1771. When the Board of Admiralty determined to take up the buſineſs, captain Cook was immediately fixed upon as the perſon beſt qualified for conducting an enterpriſe which was to give the utmoſt poſſible extent to the geography of the globe, and the knowledge of navigation. Two ſhips, ſimilar in conſtruction to the Endeavour, were provided for this purpoſe; the largeſt of the two, which conſiſted of 462 tons burthen, was named the Reſolution; and to the other, conſiſting of 336 tons burthen, was given the name of the Adventure. On the 28th of November 1771, captain Cook was appointed to the command of the former; and, about the ſame time, Mr. Tobias Furneaux was promoted to the command of the latter. The complement of the Reſolution, in officers and men, was fixed at 112 perſons, and that of the Adventure at 81. In the equipment of theſe ſhips, attention was directed to every circumſtance that could contribute to the comfort and ſucceſs of the voyage. Lord Sandwich was ſingularly attentive on the occaſion; and both the navy and victualling boards took care to procure for the ſhips the beſt ſtores and proviſions, together with an ample ſupply of antiſcorbutic articles, ſuch as malt, ſour krout, ſalted cabbage, portable broth, ſoup, muſtard, marmalade of carrots, and inſpiſſated juice of wort and beer. Scientific objects were alſo duly regarded. Mr. William Hodges, an excellent landſcape painter, Mr. Reinhold Foſter, and his ſon, well informed in natural hiſtory, and Mr. William Wales, and Mr. William Bayley, ſkilful aſtronomers, were appointed to accompany the expedition; they were furniſhed with the beſt inſtruments for obſervation, and particularly with four time-pieces, three of Mr. Arnold's conſtruction, and one of Mr. Kendal's, upon the principles of Mr. Harriſon. Captain Cook, on board the Reſolution, joined the Adventure in Plymouth Sound, on the 3d of July 1772, and there received his inſtructions, which comprehended, without entering into a minute detail, the moſt enlarged plan of diſcovery that is known in the hiſtory of navigation. He was inſtructed not only to circumnavigate the whole globe, but to circumnavigate it in high ſouthern latitudes, making ſuch traverſes, from time to time, into every corner of the Pacific ocean not before examined, as might finally and effectually reſolve the much agitated queſtion about the exiſtence of a ſouthern continent, in any part of the ſouthern hemiſphere, to which acceſs could be had, by the efforts of the boldeſt and moſt ſkilful navigators.

On the 17th of July, captain Cook ſailed from Plymouth, and on the 29th anchored in Funchiale road, in the iſland of Madeira. Having ſupplied himſelf with water, wine, and other neceſſaries, he left the iſland Aug. 1ſt, and ſailed to the ſouthward. As he proceeded, he made three puncheons of beer of the inſpiſſated juice of malt, and the liquor was briſk and drinkable; though on account of the heat of the weather, and the agitation of the ſhip, the juice was in a high ſtate of fermentation. If it could be kept from fermenting, this would be a moſt valuable article at ſea. At St. Jago, one of the Cape de Verd iſlands, he ſtopped to procure a freſh ſupply of water. On the 20th of the month, they were delayed with rain; but to guard againſt the pernicious effects of rain on any future occaſion, captain Cook took care to well air and dry the ſhip with fires between the decks, and to ſmoak its damp places; beſides, the people were ordered to air their bedding, and to waſh and dry their cloaths, whenever they had an opportunity; ſuch was the reſult of theſe precautions, that there was not one ſick perſon on board the Reſolution. On the 8th of September, the ſhip croſſed the line in W. long. 8°, and proceeded on its voyage. On the 29th, being near the Cape of Good Hope, the whole ſea, as far as our voyagers could ſee, became at once, as it were, illuminated. In order to aſcertain the true cauſe of this phenomenon, which had in the former voyage been attributed to luminous inſects, captain Cook examined ſome buckets of water, and found in them a number of globular inſects, about the ſize of a common pin's head, and quite tranſparent. Mr. R. Forſter was ſatisfied that theſe were the cauſe of the ſea's illumination. On the 30th, the Reſolution and Adventure anchored in Table bay; and the captains on going a-ſhore, were received by the governor with great politeneſs. On the 22d of November, our commander ſailed from the Cape, and proſecuted his voyage in ſearch of a ſouthern continent. He directed his courſe for Cape Circumciſion; but, by tempeſtuous weather, our voyagers were driven far to the eaſtward of their intended courſe, being in S. lat. 48° 41′. E. long. 18° 24′, ſo that they had no hopes of reaching this Cape. In this gale, they had the misfortune to loſe the principal part of the live ſtock on board, conſiſting of ſheep, hogs, and geeſe.

On the 10th of December, in S. lat. 50° 40′, and long. 2° E. of the Cape of Good Hope, they began to meet with iſlands of ice, one of which was judged by captain Cook to be about 50 feet high, and half a mile in circuit. The weather was hazy, and danger was imminent. On the 18th they happily got clear of the field of ice. They were now in S. lat. 55° 8′, and long. 24° 3′. An opinion had been entertained, that ſuch ice was formed in bays and rivers; and hence our voyagers were led to conclude, that land was not far diſtant. But they proceeded without finding it. The whole crew began to complain much of cold, and therefore the captain directed the ſleeves of their jackets to be lengthened with baize, and ordered a cap to be made for each, ſtrengthened with canvas. This ſeaſon, it ſhould be recollected, was with them the middle of ſummer. As ſome of the crew appeared to have ſymptoms of the ſcurvy, freſh wort was given them every day. By the 29th, the commander was ſatisfied that the field of ice, along which the ſhips had ſailed, did not join to any land. Determining to run as far W. as the meridian of Cape Circumciſion, a gale ſprung up on the 31ſt, which brought with it ſuch a ſwell of ſea, as rendered a continuance among the ice perilous; our navigators, therefore, hauled to the ſouth. On the 1ſt of January 1773, the gale abated, and the people had a ſight of the moon, which they had obſerved but once, ſuch was the ſtate of the weather ſince they had left the Cape of Good Hope. They were now in S. lat. 58° 53′ 30″, and E. long. 9° 34′ 30″. In this ſituation, land, if it had exiſted, might have been at the diſtance of 14 or 15 leagues; but as it was not viſible, captain Cook concluded it to be very probable, that Bouvet had miſtaken mountains of ice for land. Upon the whole, there was reaſon to believe that no land was to be met with under this meridian, between the latitude of 55 and 59 degrees, as ſome had ſuppoſed. From the ice, however, captain Cook derived the advantage of procuring a ſupply of freſh water, which was ſweet, and well taſted. On the fields of ice, they obſerved penguins, albatroſſes, and other birds; but the prevalent opinion, that ſuch birds never go far from land, was now found to be erroneous. On the 17th of January captain Cook, having reached the latitude of 67° 15′ S., could advance no farther; and as the ice towards the ſouth exhibited no appearance of any opening, he thought it prudent not to perſevere in ſailing farther ſouthward, more eſpecially as the ſummer was already half ſpent, and there was no proſpect of being able to get round the ice. He, therefore, determined to ſearch for the land which had lately been diſcovered by the French, and ſeparated the ſhips at an interval of four miles, the weather being occaſionally clear, as the beſt method of inveſtigation. On the 1ſt of February our voyagers were in S. lat. 48° 30′, and E. long. 58° 7′, nearly in the meridian of the iſland of St. Mauritius. From the perpetual high ſea which had been lately met with, captain Cook inferred that there could be no great extent of land to the weſt. But whilſt he was ſteering eaſtward, in S. lat. 49° 13′, captain Furneaux ſuggeſted that the land was to the N.W. of them, as he had obſerved the ſea to be ſmooth when the wind blew in that direction. Captain Cook, in deference to this opinion, purſued the ſearch; and the reſult was a conviction, that, if any land was near, it could be only an iſland of inconſiderable extent. In this part of the ſouthern ocean the mean variation of the compaſs was 29° 4′ W. When the ſun was on the ſtarboard of the ſhip, the variation was the leaſt; and when on the larboard ſide, the greateſt. A ſeparation now took place between the two ſhips, and the Reſolution was under a neceſſity of purſuing its voyage alone. As they proceeded they were ſatisfied that the ſight of oceanic birds, which frequent high latitudes, are no ſure ſigns of the vicinity of land. In the morning of the 17th, lights were ſeen in the heavens, ſimilar to thoſe which are known in the northern hemiſphere under the appellation of Aurora Borealis. On the 20th our navigators thought they ſaw land to the ſouth-weſt; but they found, on endeavouring to approach it, that they had been deceived by clouds, and nothing could be diſcerned but ice iſlands. At night the Aurora Auſtralis was again ſeen, aſſuming a very brilliant and luminous appearance, diſcovering itſelf firſt in the eaſt, and ſoon ſpreading over the whole heavens. On the 23d, in S. lat. 61° 52′. E. long. 95° 2′, our navigators, in the midſt of mountains of ice, were on every ſide ſurrounded with danger; and hence captain Cook was led to alter his purpoſe of once more croſſing the Antarctic circle; and on the 24th he ſtood to the north, expoſed to the hazard of injury from large pieces of broken ice, in very thick and hazy weather. In ſailing from the 25th to the 28th captain Cook was convinced to a certainty, that no land, of any conſiderable extent, could lie within 100 or 150 leagues from eaſt to ſouth-weſt. As he proceeded on his voyage from the 28th of February to the 11th of March, he had ample reaſon for concluding, from the ſwell of the ſea and other circumſtances, that there could be no land to the ſouth, that did not lie at a great diſtance. By obſervation of the ſun and moon on the 13th and 14th they were in S. lat. 58° 22′. E. long. 136° 22′. Mr. Kendal's and Mr. Arnold's watches gave each of them 134° 42′; and this was the firſt and only time, in which they had pointed out the ſame longitude ſince the ſhips had left England: the greateſt difference, however, between them, ſince our navigators had left the Cape, had not much exceeded two degrees. Farther evidence occurred to our commander, as he advanced in his courſe, that he had left no land behind him, in the direction of W. S. W., and that no land lay to the S. on this ſide of 60 degrees of latitude. On the 17th he therefore determined to quit the high ſouthern latitudes, being now in S. lat. 59° 7′, and E. long. 146° 53′, and to proceed to New Zealand, in ſearch of the Adventure, and for the refreſhment of his people. He had alſo a deſire of viſiting the eaſt coaſt of Van Diemen's land, in order to gain ſatisfaction whether it joined the coaſt of New South Wales. But the wind preventing his accompliſhing this object; he ſhaped his courſe for New Zealand, and came to anchor on the 26th in "Duſky bay." He had now been 117 days at ſea, in which time he had ſailed 3660 leagues, without once coming within ſight of land. So ſalutary had been the effects of ſweet wort and ſeveral articles of proviſion, and eſpecially of the frequent airing and ſweetening of the ſhip, that there was only one man on board who could be ſaid to be afflicted with the ſcurvy; and his diſorder was occaſioned by a bad habit of body and a complication of other diſeaſes. On the 27th the ſhip entered "Pickerſgill Harbour," ſo called from the name of the gentleman by whom it had been firſt diſcovered, and ſituated in S. lat. 45° 47′ 26½″ S. and E. long. 166° 18′. Here wood for fuel and other purpoſes was immediately at hand: and a fine ſtream of freſh water was not above 100 yards from the ſtern of the veſſel. Having ſelected a ſuitable place on the ſhore for future operations, captain Cook employed ſome of the crew in the brewing of beer from the branches or leaves of a tree reſembling the American black ſpruce, which, with the addition of the inſpiſſated juice of wort and melaſſes, would make, as he knew, a very wholeſome liquor, and ſupply the want of vegetables of which the country was deſtitute. While captain Cook continued in this ſituation, he took every opportunity of examining the bay. See DUSKY *Bay*.

On the 11th of May, captain Cook left Duſky bay, and directed his courſe for Queen Charlotte's Sound, where he expected to find the Adventure; but on the 17th, the wind flattened to a calm, the ſky became ſuddenly obſcured by dark denſe clouds, and there was every prognoſtication of a tempeſt. Soon after ſix water ſpouts were ſeen, four of which roſe and ſpent themſelves between the ſhip and the land; but they all ſpent themſelves without doing any injury. On the next day the Reſolution came within ſight of Queen Charlotte's Sound, and there capt. Cook had the ſatisfaction of finding the Adventure; after a ſeparation of fourteen weeks, captain Furneaux had an opportunity of examining Van Diemen's land; and it was his opinion that there are no ſtraits between this land and New Holland, but a very deep bay. He met likewiſe, with farther proofs, that the New Zealanders are eaters of human fleſh. On the morning after captain Cook's arrival in Queen Charlotte's Sound, he went on ſhore and returned with a boat-load of ſcurvy-graſs, celery, and other vegetables; and he gave orders that they ſhould be boiled, with wheat and portable broth, every day for breakfaſt, and with peaſe and broth for dinner. Experience had taught him that theſe vegetables, thus dreſſed, are very beneficial to ſeamen, in removing various ſcorbutic complaints. The intercourſe with the natives of the country was of a friendly nature; and proved advantageous in a variety of reſpects, particularly in ſupplying a quantity of fiſh. On the 2d of June, when the ſhips were almoſt ready to put to ſea, captain Cook ſent on ſhore a male and female goat; and captain Furneaux left at Cannibal cove, two breeding ſows, and a boar. It is a remarkable circumſtance, that during captain Cook's ſecond viſit to Charlotte Sound, he could not recollect the face of any one perſon he had ſeen three years before, nor did it appear that a ſingle Indian had any knowledge of him. Hence he infers, that in the interval the natives had either been driven away, or had removed, of their own accord, to ſome other ſituation. Not one-third of the inhabitants, formerly obſerved, ſeemed to be now there; their ſtrong hold on the point of Motuara was deſerted, and in every part of the Sound many forſaken habitations were diſcovered.

In the captain's opinion, the place had never been very populous. From comparing the two voyages, it appears that the Indians of Eahei-nomauwe are in ſomewhat of a more improved ſtate of ſociety than thoſe of Tavai-poenammoo. During captain Cook's ſtay in the Sound, he had obſerved that the ſecond viſit to this country had not mended the morals of the natives of either ſex. He had always looked upon the females of New Zealand as more chaſte than the generality of Indian women. But he was now told, that the male Indians were the chief promoters of a ſhameful traffic, and that, for a ſpike-nail, or any other thing they valued, they would oblige the women to proſtitute themſelves, whether it was agreeable or contrary to their inclinations. At the ſame time, no regard was paid to the privacy which decency required. The account of this fact muſt be read with concern by every well-wiſher to the good order and happineſs of ſociety, even without adverting to conſiderations of a higher nature. On the 7th of June captain Cook put to ſea from Queen Charlotte's Sound together with the Adventure; and on the 1ſt of Auguſt, when they were in S. lat. 25° 1′, and W. long. 134° 6′, they were nearly in the ſituation aſſigned by captain Carteret for "Pitcairn's iſland," diſcovered by him in 1767; but they did not obſerve it. As our commander advanced in his courſe, every circumſtance concurred to convince him that between the meridian of America and New Zealand there is no ſouthern continent; and that there is no continent farther to the ſouth unleſs in a very high latitude. But the inveſtigation and deciſion of the fact were reſerved for the employment of the enſuing ſummer. It was the 6th of Auguſt before the ſhips had the advantage of the trade wind; which they got at S.E. in S. lat. 19° 36′. W. long. 131° 32′. Having obtained this wind, captain Cook directed his courſe to the W.N.W. and proceeded in the track purſued by M. de Bougainville. To four of the iſlands which he paſſed, he gave the names of "Reſolution iſland," "Doubtful iſland," "Furneaux iſland," and "Adventure iſland," which ſee reſpectively. Theſe are ſuppoſed to be the ſame that were ſeen by M. de Bougainville; and they, with ſeveral others, conſtitute a cluſter of low and half-drowned iſles, which that gentleman diſtinguiſhed by the name of the Dangerous Archipelago. On the 15th of Auguſt the ſhips came within ſight of "Oſnaburg iſland," or Maitea, which had been diſcovered by captain Wallis. Having eſcaped being wrecked on the coaſt of Otaheite, they anchored, on the 17th, in Oaitipiha bay, near the S.E. end of the iſland; and they were immediately crowded with the inhabitants of the country, who brought with them cocoa-nuts, plaintains, bananas, apples, yams, and other roots, which were exchanged for nails and beads. On the 24th the ſhips put to ſea, and arrived the next evening in Matavai-bay; but before they could come to anchor, the decks were crowded by the natives, many of whom were known to captain Cook or by moſt of whom he was well remembered. At Oparree the tents and aſtronomer's obſervatories remained, on the ſame ſpot from which the tranſit of Venus had been obſerved in 1769. As ſoon as the ſick were recovered, the water completed, and the neceſſary repairs of the ſhips finiſhed, captain Cook determined to put to ſea, and on the 1ſt of September he ordered the veſſels to be unmoored. In the mean while lieutenant Pickerſgill returned from Attahourou, where he had been to procure hogs; and in this expedition he had ſeen Oberea, in a very humble ſituation, compared with that which ſhe had formerly occupied. In the evening of this day a favourable wind having ſprung up, the commander put to ſea; on which occaſion he diſmiſſed his Otaheite friends ſooner than they wiſhed to depart; but well ſatisfied with his kind and liberal treatment. From Matavai captain Cook directed his courſe for the iſland Huaheine; this he reached the next day, and on the 3d of September anchored in the harbour of Owharre. Both the captains landed upon the iſland, and being cordially received by the natives, commenced a trade with them. Every thing was conducted with mutual confidence and harmony till the 6th, when ſeveral circumſtances occurred on the part of the natives, which interrupted the friendly intercourſe. Captain Cook at length complained to Oreo, the king, of their inſolence and frauds, who was much concerned on the occaſion; and exerted himſelf to obtain redreſs and to puniſh the delinquents. It was from the iſland Huaheine that captain Furneaux received into his ſhip a young man named Omai, a native of Ulietea, of whom ſo much hath ſince been known and written. This choice was at firſt diſapproved by captain Cook, who thought that this youth was not a proper ſample of the inhabitants of the Society iſlands; being inferior to many of them in birth and acquired rank, and not having any peculiar advantage with reſpect to ſhape, figure, or complexion. The captain afterwards found reaſon to be better ſatisfied with Omai's having accompanied our navigators to England. At Huaheine the veſſels, though their ſtay was ſhort, obtained very plentiful ſupplies of proviſions. Not leſs than 300 hogs, beſides fowls and fruit, were procured. From Huaheine our navigators ſailed for Ulietea, where trade was carried on in the uſual manner, and a moſt friendly intercourſe renewed between captain Cook and Oreo, the chief of the iſland. An interruption took place in the intercourſe between the ſhips and the natives, which was occaſioned by a miſapprehenſion on the part of the latter, and which upon proper explanation was ſoon rectified. So that proviſions were furniſhed at Ulietea no leſs plentifully than at Huaheine. Captain Cook eſtimated that the number of hogs, which had been obtained, amounted to 400 or upwards. Our commander, by his ſecond viſit to the Society iſlands, gained a farther knowledge of their general ſtate and of the cuſtom of the inhabitants. With regard to a certain diſorder, captain Cook was not able to determine whether it was known to the iſlanders before they were viſited by the Europeans; but he found upon inquiry that the introduction of it, if of recent origin, was unanimouſly aſcribed to the voyage of M. de Bougainville.

ville. Captain Cook wiſhed to ſatisfy himſelf, whether human ſacrifices conſtituted a part of the religious cuſtoms of theſe people. From Omai he afterwards learned that the inhabitants of the Society iſlands offer human ſacrifices to the Supreme Being. The knowledge he was able to obtain concerning their religion was very defective. With regard to the character of their women, he was enabled to rectify a prevailing error; and he does them juſtice by informing us, that the favours both of the married women and of the unmarried, of the better ſort, were as difficult to be obtained in the Society iſlands as in any other country. And as to the unmarried females of the lower claſs, there were many who would not admit of any indecent familiarities. This voyage enabled our commander to gain ſome further knowledge concerning the geography of the Society iſles; and he found it highly probable, that Otaheite is of greater extent than he had computed it in his former eſtimation. On the 17th of September captain Cook ſailed from Ulietea, directing his courſe to the weſt, with an inclination to the ſouth. Land was diſcovered on the 23d, to which he gave the name of “Harvey's iſland.” S. lat. 19°18'. W. long. 158°54'. On the 1ſt of October he reached the “iſland of Middleburg.” From Middleburg the ſhip ſailed to “Amſterdam,” the natives of which iſland were no leſs diſpoſed than thoſe of the former to maintain a friendly intercourſe with the Engliſh. A few old rags at this iſland were ſufficient for the purchaſe of a pig or a fowl.

Although the natives of Amſterdam were of a friendly diſpoſition, they were not entirely free from the thieviſh propenſity which pertained to the iſlanders of the Southern Ocean. The two iſlands of Middleburg and Amſterdam are guarded from the ſea by a reef of coral rocks, extending from the ſhore about 100 fathoms. Similar to this, in a great meaſure, is the ſituation of all the tropical iſles which our commander had ſeen in that part of the globe: and hence ariſes an evidence of the wiſdom and goodneſs of Providence; as by ſuch a proviſion nature has effectually ſecured them from the encroachments of the ſea, though many of them are mere points, when compared with the vaſt ocean by which they are ſurrounded The two iſlands above-mentioned are ſituated between the lat. of 21° 29' and 21° 3' S., and between the long. of 174° 40' and 175° 15' W. See AMSTERDAM and MIDDLEBURG.

On the 7th of October captain Cook proceeded on his voyage: next day he paſſed the “iſland of Pilſtart,” diſcovered by Tanoram, and ſituated in S. lat. 22° 26'. W. long. 175° 59'. On the 21ſt he made the land of New Zealand, at the diſtance of 8 or 10 leagues from Table cape. To a chief, who came off in a canoe, he gave two boars, two ſows, four hens, and two cocks, and a quantity of ſeeds, of wheat, French and kidney beans, peaſe, cabbage, turnips, onions, carrots, parſnips, and yams. On the 3d of November the Reſolution was brought into Ship Cove, in Queen Charlotte's Sound. After his arrival, the firſt object of the captain was to provide for the repair of his ſhip, and the next to examine into the ſtate of his bread, much of which had become unfit for uſe. To the inhabitants, who reſided at the Cove, he gave a boar, a young ſow, two cocks, and two hens, which he had brought from the Society Iſlands; and at the bottom of the weſt bay he ordered to be landed three ſows and a boar, together with two cocks and two hens; together with as much food as would laſt them 10 or 12 days. In the ſecond viſit of our navigators to New Zealand, they met with indubitable evidence that the inhabitants were eaters of human fleſh; but it was captain Cook's firm opinion, that the only fleſh that was eaten by theſe people was that of their enemies who had been ſlain in battle. Our commander did not leave New Zealand without making ſuch remarks on the coaſt between Cape Teerawhitte and Cape Palliſer, as may be of uſe to future navigators. As the Adventure had been ſeparated from the Reſolution, and was thought to be no where upon the iſland, captain Cook gave up all hopes of ſeeing her any more during the voyage. On the 26th of November the captain ſailed from New Zealand, in ſearch of a continent, and ſteered to the ſouth, inclining to the eaſt. Some days afterwards, our navigators reckoned themſelves to be antipodes to their friends in London, and conſequently at as great a diſtance from them as poſſible. The firſt ice iſland which they ſaw, was on the 12th of December, in S. lat. 62° 10'. W. long. 172°. In the proceſs of the voyage ſuch iſlands continually occurred, and the navigation became daily more difficult and dangerous. In S. lat. 67° 5', our voyagers all at once got within ſuch a cluſter of theſe iſlands, and of looſe pieces, that they found it almoſt impoſſible to eſcape. However, being releaſed, the Reſolution, on the 22d of the month, was in the higheſt latitude ſhe had yet reached, *viz.* 67° 31'. W. long. 142° 54'; and circumſtances became ſo unfavourable, that captain Cook determined to return towards the north. Here was no probability of finding land, or a poſſibility of getting farther ſouth. As our navigators advanced to the N.E., on the 24th, the ice-iſlands increaſed very much upon them; and in the midſt of about 100, they ſpent Chriſtmas day. As captain Cook, agreeably to his late reſolution, had traverſed a large extent of ocean, without ſeeing land, he again directed his courſe towards the ſouth; and by the 30th of January, 1774, after encountering innumerable obſtructions, he reached to S. lat. 71° 10'. W. long. 106° 54'. Farther it would have been extreme folly to have proceeded. The captain was of opinion, in which moſt of the gentlemen on board concurred, that the ice now in ſight extended quite to the pole, or might join to ſome land, to which it might have been fixed from the earlieſt time. Compelled at laſt by inevitable neceſſity to tack, and to ſtand towards the north, captain Cook formed a reſolution of ſpending the enſuing winter within the tropic. He was well ſatisfied, that no continent was to be found in this ocean, but that which muſt lie ſo far ſouth as to be wholly inacceſſible, on account of ice. If a continent exiſted in the Southern Atlantic Ocean, he was ſenſible that he muſt have the whole ſummer before him, in order to explore it. Upon the ſuppoſition, that no land could be found, he might reach the Cape of Good Hope by April: in that caſe he would have finiſhed the buſineſs of finding a continent, which was indeed the firſt object of the voyage. But this could not ſatisfy the comprehenſive and magnanimous mind of our commander. He had a good ſhip, expreſsly ſent out on diſcoveries, a healthy crew, and wanted neither ſtores nor proviſions. In ſuch circumſtances, to have quitted this Southern Pacific Ocean would have been betraying, as he thought, not only a want of perſeverance, but of judgment, in ſuppoſing it to have been ſo well explored, that nothing farther could be done. Although he had proved that, if there were a continent, it muſt lie far to the ſouth, there remained room for very large iſlands, in places as yet unexamined. He was alſo perſuaded, that his continuing for ſome time longer in this ſea would be ſerviceable to geography and navigation, and other ſciences. Thus he reaſoned; and accordingly it was his intention firſt to go in ſearch of the land, ſaid to have been diſcovered by Juan Fernandez, in the laſt century, in about the lat. of 38°; and if he failed in finding this land, he propoſed to direct his courſe in queſt of “Eaſter iſland,” or “Davis's land.” He next intended to go within the tropic, and ſo proceed weſtward till he arrived at Otaheite, where it was neceſſary for him to explore the Adventure. It was alſo in his contemplation to run as far weſt as the "Terra Auſtral del' Eſpiritu Santo," diſcovered by Quiros, and called by M. de Bougainville the "Great Cyclades." Hence he propoſed to ſteer to the ſouth, and ſo back to the eaſt, between the latitudes of 50° and 60°. In the execution of this plan, it was his purpoſe to attain the length of Cape Horn, in the enſuing November, when he ſhould have the beſt part of the ſummer before him, to explore the ſouthern part of the Atlantic ocean. When he communicated this extenſive plan, comprehending hazards and difficulties without number, to his officers, they unanimouſly and chearfully concurred. In purſuing his courſe to the north, captain Cook became well aſſured that the diſcovery of Juan Fernandez, if any ſuch was ever made, could be nothing more than a ſmall iſland. Our captain was at this time confined to his bed by a bilious colic: by the attention of Mr. Patten, the ſurgeon, he was relieved, and at length the diſorder ſubſided; but his ſtomach was ſo weak, that he could taſte nothing but the broth and fleſh of a favourite dog, belonging to Mr. Forſter. On the 11th of March our navigators came within ſight of "Eaſter iſland," or "Davis's land." in S. lat. 27° 5′ 30″. W. long. 109° 46′ 20″. On the 6th and 7th of April they came within ſight of four iſlands, which they knew to be the "Marqueſas." To one of them captain Cook gave ehe name of "Hood's iſland;" and as ſoon as the ſhip was brought to an anchor in Madre de Dios, or Reſolution bay, in the iſland of "Chriſtina," a traffic commenced, in the courſe of which the natives would frequently keep the goods, without making any return. Theft was ſo common, that it was impoſſible to guard againſt it; and one of the thieves was accidentally killed by a ſhot, in the act of ſtealing. After ſome time the trade was carried on in a better manner; and the ſhip was ſupplied with yams, plantains, bread-fruit, a few cocoa-nuts, fowls, and ſmall pigs. From the Marqueſas captain Cook ſteered for Otaheite, with a view of falling in with ſome of the iſlands diſcovered by former navigators, and eſpecially by the Dutch, the ſituation of which had not been accurately determined. In the courſe of the voyage he paſſed a number of low iſlets, connected together by reefs of coral rocks. One of theſe iſlands was "Tiookea," diſcovered and viſited by Byron. Beſides paſſing by "St. George's iſlands," ſo named by captain Byron, captain Cook diſcovered four others, which he called "Palliſer's iſles." On the 22d he anchored in Matavai bay, at Otaheite, where he took meaſures for the repairs of the ſhip. During his ſtay at Otaheite, he maintained a moſt friendly connection with the inhabitants; and a continual interchange of viſits took place between him and Otoo, Towka, and other chiefs of the country. On the 15th of May, our captain anchored in O'wharre harbour, in the iſland of Huaheine, where he procured bread-fruit, cocoa-nuts, and other vegetables in abundance; but there was a ſcarcity of hogs. When they were leaving the iſland, the good old chief, Oreo, was the laſt man that left the veſſel. At parting, captain Cook told him that they ſhould meet each other no more: Oreo wept, and ſaid, "let your ſons come, we will treat them well." At Ulietea nothing particular occurred. It was the laſt requeſt of Oreo, the chief, to captain Cook, that he would return; and when he could not obtain a promiſe to that effect, he aſked the name of his burying place. Oreo's anguiſh at parting was very great: "he looked up at the ſhip, burſt into tears, and then ſunk down into the canoe." On the 6th of June, the day after our voyagers left Ulietea, they ſaw land, which they found to be a low reef iſland, about four leagues in compaſs, and of a circular form, called "Howe iſland," diſcovered by captain Wallis, and ſituated in S. lat. 16° 46′. W. long. 154° 8′. Another reef iſland was ſeen on the 16th, to which captain Cook gave the name of "Palmerſton iſland," in S. lat. 18° 4′. W. long. 163° 10′. On the 20th land was again ſeen, called by captain Cook "Savage iſland," S. lat. 19° 1′. W. long. 169° 37′. Purſuing his courſe to the W.S.W., captain Cook paſſed by a number of ſmall iſlands, and on the 26th anchored on the north ſide of "Anamooka," or "Rotterdam," S. lat. 20° 15′. W. long. 174° 31′. While the captain was on ſhore at this iſland, he got the names of 20 iſlands which lie between the N.W. and N.E.; but two of them are moſt remarkable on account of their great height, *viz.* "Amattafoa," and "Oghao." From the N.W. to the S. of Rotterdam, round by the E. and N., it is encompaſſed by many ſmall iſles, ſand-banks, and breakers: no termination of them could be ſeen to the N., and they may poſſibly reach as far S. as Amſterdam, or Tongataboo. Together with Middleburg or Eaoowe and Pilſtart, theſe form a group, containing about three degrees of latitude and two of longitude; and captain Cook called them the "Friendly iſles, or Archipelago." Purſuing their courſe to the weſt, our navigators diſcovered land on the 1ſt of July, which they found to be a ſmall iſland, to which captain Cook gave the name of "Turtle iſle," on account of the number of turtle which were ſeen on the coaſt. On the 16th high land was ſeen to the S.W., which was the Auſtralis del' Eſpiritu Santo of Quiros, or the Great Cyclades of M. de Bougainville. After exploring the coaſt for ſome days, the captain anchored in a harbour of the iſland of "Mallicollo," which he called "Port Sandwich," ſituated on the N.E. ſide of the iſland, not far from the S.E. end, in S. lat. 16° 25′ 20″. E. long. 167° 57′ 23″. On the 23d of July our navigators, having gotten to ſea, diſcovered three or four ſmall iſlands; and at this time the Reſolution was not far from the "iſle of Ambryu," "the iſle of Paoom," and "the iſle of Apee;" S.E. of which latter iſland was diſcovered a group, which captain Cook called "Shepherd's iſles." Amidſt the number of iſlands now obſerved, one only appeared to be uninhabited: it conſiſted of a remarkable peaked rock, acceſſible only to birds, and obtained the name of the "Monument." In the farther courſe of the ſhip to the ſouthward, our navigators approached other iſlands, which they found to conſiſt of one large iſland, and three or four ſmaller ones. The two principal of the latter were called "Montagu" and "Hinchinbrook;" and the large iſland captain Cook named "Sandwich," in honour of his patron, the earl of Sandwich. Purſuing his diſcoveries, he came to an iſland, called by the natives "Erromangu," in a bay of which he anchored. As the inhabitants behaved treacherouſly, captain Cook called a promontory, or peninſula, near which a ſkirmiſh happened, "Traitor's Head," in S. lat. 18° 43′. E. long. 169° 28′. From this place the captain ſailed for an iſland, before diſcovered, on which he propoſed to make ſome ſtay, for the purpoſe of obtaining a ſupply of wood and water. This iſland was called "Tanna;" and three others near it were diſtinguiſhed by the names of "Immer," "Errona," or "Footoona," and "Annatom." The harbour in which he anchored was called by him "Port Reſolution," after the name of the ſhip; it was ſituated in S. lat. 19° 32′ 25½″, and E. long. 169° 44′ 35″. To this Archipelago, or group of iſlands, which captain Cook particularly examined, he gave the name of "New Hebrides." The ſeaſon of the year came on when captain Cook propoſed to return towards the ſouth; but he improved the intervening time in exploring any land which he might yet meet with between the New

Hebrides and New Zealand, at which place it was his intention to refreſh his people, and to renew his ſtock of wood and water for another ſouthern courſe. Sailing with this view, September the 1ſt, he diſcovered land on the 4th; and the Reſolution anchored next day in a harbour belonging to it. The inhabitants behaved to him in a very civil and friendly manner; and he returned their kindneſs with preſents to their chief. Captain Cook gave this iſland the name of "New Caledonia." On one of the ſmall adjoining iſlands the captain found a ſpecies of ſpruce pine, of which ſpars and very good maſts might be made, and called it the "iſle of Pines." To another, which afforded ample employment to the botaniſts, he gave the name of "Botany iſle." The captain, before he left this iſland, was enabled ſo far to ſurvey it as to aſcertain, that, excepting New Zealand, it is probably the largeſt iſland in the South Pacific ocean. Another iſland was obſerved of good height, and five leagues in circuit, to which was given the name of "Norfolk iſle," in S. lat. 29° 2′ 30″. E. long. 168° 16′. On the 18th of October our captain anchored in Ship Cove, in Queen Charlotte's Sound, on the coaſt of New Zealand; and his intercourſe with the inhabitants was altogether peaceable and friendly. Mr. Wales, on this occaſion, accurately aſcertained the latitude and longitude of this ſound, and found the bottom of Ship Cove to be in S. lat. 41° 5′ 56½″, and E. long. 174° 25′ 7½″. The 10th of November captain Cook left New Zealand, in the proſecution of his great object, or the determination of the queſtion concerning the exiſtence of a ſouthern continent. Having ſailed in different latitudes, extending from 43° to 55° 48′ S., till the 27th, the ſhip being in W. long. 138° 56′, he gave up all hopes of finding any more land in this ocean. He therefore reſolved to ſteer directly for the weſt entrance of the ſtraits of Magalhaens, with a view of coaſting the S. ſide of Terra del Fuego, round Cape Horn, to the ſtrait Le Maire. In the proſecution of this voyage, on the 17th of December, he reached the W. coaſt of Terra del Fuego, and on the 20th anchored in a place to which he gave the name of "Chriſtmas Sound." The whole coaſt and country were deſolate and unintereſting. Near every harbour, however, freſh water and wood for fuel were obtained. The country alſo abounds with wild fowl, and particularly geeſe. See CHRISTMAS *Sound*, and *Terra del* FUEGO. On the 28th, captain Cook left Chriſtmas Sound, and proceeded round Cape Horn, through ſtrait Le Maire, to Staten land. Having paſſed this famous Cape on the next day, he entered the ſouthern Atlantic ocean. On Staten iſland he found a port, on the 1ſt of January, which, from this circumſtance, was denominated "New Year's Harbour." In the ſmall iſlands adjacent to Staten land, and called "New Year's Iſles," captain Cook perceived a harmony between the different animals of the place, which he thought deſerving of being recorded. It ſeemed, he ſays, as if they had entered into a league not to diſturb each other's tranquillity. The greater part of the ſea coaſt is occupied by the ſea-lions; the ſea-bears take up their abode in the iſle; the ſhags are poſted on the higheſt cliffs; the penguins fix their quarter where they have the moſt ready communication with the ſea; and the reſt of the birds chuſe the moſt retired places. All theſe animals were occaſionally ſeen to mix together like domeſtic cattle and poultry in a farm yard, without any attempt on the part of one to moleſt the other. Nay, the captain had often obſerved the eagles and vultures ſitting on the hills among the ſhags, while none of the latter, whether old or young, appeared to be in the leaſt diſturbed at their preſence. Should it be aſked, how do theſe birds of prey live? The captain anſwers the queſtion, by ſuppoſing, that they feed on the carcaſes of ſeals and birds, which periſh by various cauſes. It is probable, from the immenſe quantity of animals with which the iſle abounds, that ſuch carcaſes exiſt in great numbers. On the 4th of January, captain Cook ſailed from Staten iſland, in order to reconnoitre that extenſive coaſt laid down by Mr. Dalrymple in his chart, in which is the gulf of St. Sebaſtian. As he had ſome doubt of the exiſtence of ſuch a coaſt, he determined to make the weſtern point of the gulf; but when he came to the different points of it, he could diſcover neither land nor any unequivocal ſigns of it. Proceeding in his voyage, land was ſeen on the 14th, but being almoſt wholly covered with ſnow, it was at firſt miſtaken for an iſland of ice. This was named from its firſt obſerver, "Willis's iſland," S. lat. 54°. W. long. 38° 23′. Another larger iſland, on which was a very conſiderable number of birds, was called "Bird iſland." On the 17th captain Cook landed in a bay of an extenſive tract of country, very deſolate in its appearance, which he took poſſeſſion of in his majeſty's name. The bay, ſituated in S. lat. 54° 5′. W. long. 37° 18′, he called "Poſſeſſion bay," and the country, which proved to be an iſland 70 leagues in circuit, was called the "iſle of Georgia," ſituated between 53° 57′, and 54° 57′ S. lat., and 38° 13′, and 35° 34′ W. long. On the 27th captain Cook, having left Georgia the 25th, computed that he was in S. lat. 60°. Here he was ſatisfied there could be no land in the direction towards the W., from which there was a long hollow ſwell; and hence he inferred, that the extenſive coaſt laid down in Mr. Dalrymple's chart of the ocean between Africa and America, and the gulf of St. Sebaſtian, doth not exiſt. An elevated coaſt, obſerved on the 31ſt, was called the "Southern Thule," S. lat. 59° 13′ 30′. W. long. 27° 45′. To the more diſtinguiſhed tracts of country, diſcovered from Jan. 31ſt to Feb. 6th, captain Cook gave the names of "Cape Briſtol," "Cape Montagu," "Saunders's iſle," "Candlemas iſles," and "Sandwich's land." The laſt is either a group of iſlands, or elſe a point of the continent; for the captain was firmly of opinion, that a conſiderable tract of land exiſted near the pole, which was the ſource of moſt of the ice that is ſpread over this vaſt ſouthern ocean. He thought it probable that this land muſt extend fartheſt to the N., where it is oppoſite to the ſouthern Atlantic and Indian oceans. Ice had always been found by him farther to the north in theſe oceans than any where elſe, and this he judged could not be the caſe if there were not land of conſiderable extent to the ſouth. See *Southern* CONTINENT.

Captain Cook having accompliſhed the great object of his navigation round the globe, began to direct his views towards England. Many circumſtances relating to the ſtate of his proviſions, and the health of his crew, contributed to haſten his return. In his courſe to the Cape of Good Hope, he ſearched for the iſles of "Denia" and "Marſeveen," laid down in Halley's variation chart, in S. lat. 41° 30′, and about 4° of longitude E. of the meridian of the Cape of Good Hope; but after ſailing from February 25th to March 13th, no ſuch iſlands could be diſcovered. On the 22d of March he anchored in Table bay; having ſailed from the time of leaving the Cape of Good Hope, to his return thither, no leſs than 20,000 leagues, which was an extent of voyage nearly equal to three times the equatorial circumference of the earth. It could not therefore be ſurpriſing, that the rigging and ſails of the Reſolution ſhould be eſſentially damaged, and even worn out; and yet in the whole of this run, made in every latitude between 9° and 71°, ſhe did not ſpring either low-maſt, top-maſt, lower or top-ſail yard; nor did ſhe ſo much as break a lower or top-maſt ſhroud; theſe happy circumſtances were owing to the good properties of the veſſel, and the ſingular care and abilities of her officers. Captain Cook having completed the neceſſary repairs, and ſupplied himſelf with requiſite ſtores and proviſions, left the Cape on the 27th of April, and reached the iſland of St. Helena on the 15th of May; on the 28th he anchored on the iſland of Aſcenſion, and arrived at the iſland of Fernando de Noronha, on the 9th of June. In the progreſs of the voyage, he made an experiment upon the ſtill for procuring freſh water; the reſult of which was, that the invention is uſeful upon the whole, but that it would by no means be adviſable to truſt to it entirely; more eſpecially as captain Cook was convinced, that nothing contributes more to the health of ſeamen, than a plentiful ſupply of water. On the 16th of July, the captain anchored in the bay of Fayal, one of the Azores iſlands; and on the 19th, proceeded with all expedition for England. On the 30th, he anchored at Spithead, and landed at Portſmouth; having been abſent from Great Britain three years and 18 days, during which time, and all changes of climate, he had loſt but four men, and only one of them by ſickneſs. The able manner in which captain Cook had conducted this voyage, and the diſcoveries he had made, could not fail to recommend him to the protection and encouragement of thoſe who had patronized the undertaking. The noble lord who had taken a lead in the plans of navigation and diſcovery, was ſtill at the head of the admiralty-board; and recommended by him to his majeſty, our navigator was raiſed, on the 9th of Auguſt, to the rank of a poſt-captain, and three days after, appointed a captain in Greenwich hoſpital; a ſituation which was intended to afford him a pleaſing and honourable reward for his illuſtrious labours and ſervices. Moreover, ſo important were his diſcoveries to ſcience in general, that on the 29th of February 1776, he was unanimouſly choſen a member of the Royal Society; and on the evening of the 7th of March, when he was admitted, a paper was read containing an account of the method he had taken to preſerve the health of the ſeamen. (See Philoſ. Tranſ. vol. lxvi. p. 402—406.) Another paper was communicated, at the requeſt of the preſident, ſir John Pringle, on the 18th of April, relative to the tides in the South Sea, *viz.* thoſe in the Endeavour river, on the eaſt coaſt of New Holland. (See Phil. Tranſ. ibid. p. 447, &c.) It was alſo reſolved by the preſident and council to beſtow on captain Cook ſir Godfrey Copley's gold medal. The preſident, according to his cuſtom, delivered an elaborate diſcourſe on the ſubject of the paper, which was thus diſtinguiſhed.

The particulars of this voyage were related by captain Cook himſelf, in a manner that redounds to his reputation as a writer. His ſtyle is natural, clear, and manly; being well adapted to the ſubject and to his own character. The ſuperintendence of the publication was undertaken by his learned and valuable friend, Dr. Douglas, who lately died in the ſee of Saliſbury, and whoſe promotion afforded pleaſure to perſons of literature of every denomination. The hiſtory of the voyage was recommended to the public by the accuracy and excellence of its charts, and by a great variety of engravings from the curious and beautiful drawings of Mr. Hodges. It was followed by the publication of the original aſtronomical obſervations, which had been made by Mr. Wales in the Reſolution, and Mr. Bayley in the Adventure.

The illuſion of a "Terra Auſtralis incognita," to any purpoſes of commerce, colonization, and utility, having been diſpelled; another geographical queſtion of very general intereſt remained to be determined; and that was the practicability of a northern paſſage to the Pacific ocean. Many perſons had conceived that there was a ſhorter, a more commodious, and a more profitable courſe of ſailing to Japan and China, and, indeed, to the Eaſt Indies in general, than by the tedious circuit of the Cape of Good Hope. To find a weſtern paſſage round North America had been attempted by ſeveral bold adventurers from Frobiſher's firſt voyage, in 1576, to thoſe of James and of Fox, in 1631. By theſe expeditions a conſiderable acceſſion was made to the knowledge of the northern extent of America, and Hudſon's and Baffin's bays were diſcovered. But the wiſhed-for paſſage, on that ſide, into the Pacific ocean, was ſtill unattained. Nor were the various attempts of our countrymen, and of the Dutch, to find ſuch a paſſage, by ſailing round the north of Aſia, in an eaſtern direction, attended with better ſucceſs. Wood's failure in 1676, ſeems to have terminated the long liſt of unfortunate expeditions in that century. The diſcovery had ceaſed for many years to be an object of purſuit. However, the queſtion was revived in the laſt century. Accordingly captain Middleton was ſent out by government in 1741, and captains Smith and Moore in 1746. But, though an act of parliament had been paſſed, enſuring a reward of 20,000*l.* to the diſcovery of a paſſage, the accompliſhment of their favourite object ſtill remained to be effected. Previouſly to the full execution of this deſign, lord Mulgrave ſailed with two ſhips, in order to determine how far navigation was practicable towards the north-pole. In this expedition his lordſhip encountered many difficulties. Nevertheleſs, the expectation of opening a communication between the Pacific and Atlantic ocean, by a northerly courſe, was not abandoned; and it was reſolved that a voyage ſhould be undertaken for that purpoſe. Captain Cook was inſtantly, and unanimouſly, thought to be in every reſpect the moſt proper perſon to accompliſh this difficult and hazardous, but very important and intereſting object. He had, however, done ſo much, and undergone ſo many trials, that his moſt zealous friends, and thoſe who were moſt ardently devoted to the object, could not think of aſking him to engage in freſh perils; the undertaking, however, became a ſubject of converſation at the table of lord Sandwich, when captain Cook was preſent. The object, with all the intereſts connected with it, excited the ardour of the captain's mind, and he offered to undertake the direction of the enterpriſe. The earl of Sandwich loſt no time; the matter was laid before the king; and captain Cook was appointed to the command of the expedition, Feb. 10, 1776. At the ſame time, it was agreed, that, on his return to England, he ſhould be reſtored to his ſituation at Greenwich: and, if no vacancy occurred during the interval, the officer who ſucceeded him was to reſign in his favour. All former navigators round the globe had returned to Europe by the Cape of Good Hope; but captain Cook undertook to accompliſh the arduous taſk by reaching the high northern latitudes between Aſia and America; and it is thought that the captain's own reflections on the ſubject ſuggeſted this plan. Inſtead, therefore, of a paſſage from the Atlantic to the Pacific, one from the latter into the former was to be tried. Accordingly captain Cook was ordered to proceed into the Pacific ocean, through the chain of new iſlands, which had been viſited by him in the ſouthern tropic. After having croſſed the equator into the northern parts of that ocean, he was to hold ſuch a courſe as might probably fix many intereſting points in geography, and produce intermediate diſcoveries, in his progreſs northward to the principal ſcene of his diſcoveries. With regard to his grand object, it was determined, after the moſt mature deliberation and inquiry, that, upon his arrival on the coaſt of New Albion, he ſhould proceed northward as far as the latitude of 65°, and not loſe any time in exploring rivers or inlets, or upon any other account, till he had gotten into that latitude. In the proſecution of this great deſign, motives of intereſt were annexed to obligations of duty. By a new law, paſſed in 1776, ſupplying the deficiencies of the act of 1745, it was enacted, "that if any ſhip belonging to any of his majeſty's ſubjects, or to his majeſty, ſhall find out, and ſail through, any paſſage, by ſea, between the Atlantic and Pacific oceans, in any direction, or parallel of the northern hemiſphere, to the northward of the fifty-ſecond degree of latitude, the owners of ſuch ſhips, if belonging to any of his majeſty's ſubjects, or the commander, officers, and ſeamen of ſuch ſhip belonging to his majeſty, ſhall receive, as a reward for ſuch diſcovery, the ſum of 20,000*l*." Two veſſels were fixed upon by government for the intended ſervice; the Reſolution and the Diſcovery; the former commanded by captain Cook, and the latter by captain Clerke. To the Reſolution was aſſigned the ſame number of officers and men, which ſhe had during her former voyage; and the only difference in the eſtabliſhment of the Diſcovery from that of the Adventure, was that ſhe had no marine officer on board. Both ſhips were equipped in the moſt complete manner, and furniſhed with ſuch an eſtabliſhment and apparatus, &c. as might moſt effectually conduce to the improvement of aſtronomy and navigation. As the ſhips were to touch at Otaheite and the Society iſlands, it was determined to carry Omai back to his native country, who returned with deep impreſſions of gratitude and reſpect for the liberal treatment which he had received during his abſence, and whilſt he continued in England. Captain Cook ſailed from the Nore to the Downs on the 25th of June, and on the 30th anchored in Plymouth Sound, where the Diſcovery was already arrived. On the 8th of July he received his inſtructions, with orders to proceed to the Cape of Good Hope. On the 12th he ſtood off Plymouth Sound, and proceeding in his courſe, touched at Teneriffe; anchoring on the 1ſt of Auguſt in the road of Santa Cruz. Having procured the neceſſary articles of refreſhment, he ſailed from Teneriffe on the 4th; and on the 13th arrived before Port Praya in the iſland of St. Jago, and then, not finding the Diſcovery there, ſtood out to the ſouthward. On the 1ſt of September, our navigator croſſed the equator in W. long. 27° 38′; and on the 8th, being near the eaſtern coaſt of Brazil, he took pains to ſettle its longitude, which he concluded to be 35½° or 36° W. On the 18th of October, the Reſolution came to an anchor in Table bay, at the Cape of Good Hope. On the 10th of November captain Cook had the ſatisfaction of ſeeing the Diſcovery arrive in the bay. Beſides the attention which our captain manifeſted to the ſtate of his ſhip, and the accommodation of his ſeamen in the further proſecution of his voyage, ſcientific objects engaged his particular notice. On the 30th of November he weighed from Table bay, and on the 3d of December got clear of the land. On the 12th land was ſeen, which was found, upon a nearer approach, to conſiſt of two iſlands. That which lies moſt to the ſouth, and is the largeſt, was eſtimated to be about 15 leagues in circuit; the northerly one was about nine leagues; and the two iſlands are about the diſtance of five leagues from each other. The largeſt lies in S. lat. 46° 53′, and E. long. 37° 46′; and the ſmaller one in S. lat. 46° 4′, and E. long. 38° 8′. They ſeemed to have a rocky and bold ſhore, and their ſurface is for the moſt part compoſed of barren mountains, the ſummits and ſides of which were covered with ſnow. Theſe two iſlands, with four others, which lie from nine to twelve degrees of longitude more to the eaſt, and nearly in the ſame latitude, had been diſcovered by captain Marion du Freſne, and Crozet, French navigators, in January 1772. As no names had been aſſigned to them in a chart of the Southern ocean, communicated by Crozet to captain Cook in 1773, our commander diſtinguiſhed the two larger ones by calling them "Prince Edward's iſlands." To the other four he gave the name of "Marion's" and "Crozet's" iſlands. Paſſing ſouthward of theſe iſlands, he ſhaped his courſe ſo as to get into the latitude of the land which had been diſcovered by M. de Kerguelen, a French navigator. On the 24th he obſerved land, which proved to be an iſland of conſiderable height, and about three leagues in circuit. He ſoon after diſcovered another iſland about the ſame ſize, and alſo a third, beſides ſome ſmaller ones. Another iſland was ſeen in S. lat. 48° 29′. E. long. 68° 40′, which was a high round rock, and which was called "Bligh's Cap." This he perceived to be the ſame with Kerguelen's "iſle of Rendezvous." As ſoon as the weather began to clear up, captain Cook ſteered in for the land, called "Kerguelen's land." At length a good harbour was diſcovered, in which the ſhips anchored on Chriſtmas day. Here the captain diſplayed the Britiſh flag, and named the place "Chriſtmas Harbour." On the 29th he left this harbour, and ranged along the coaſt, in order to diſcover its poſition and extent. In purſuing his courſe he met with ſeveral promontories and bays, together with a peninſula, all of which he has deſcribed and named. Another harbour, in which the ſhips anchored for one night, is ſituated in S. lat. 49° 3′, and E. long. 69° 37′, and was called "Port Palliſer." On the 30th, when this harbour was diſcovered, he came to a point, which proved to be the very eaſtern extremity of Kerguelen's land. This point was called "Cape Digby," and is ſituated in S. lat. 49° 23′, and E. long. 70° 34′. The reſult of captain Cook's examination of Kerguelen's land was, that it did not occupy an interval much exceeding 1¼ degree. From this deſolate coaſt our captain took his departure on the 31ſt, intending to touch at New Zealand; but on the 3d of January 1777, the wind veered to the north, and on the 12th the northerly winds ended in a calm; the ſhip being then in S. lat. 48° 40′. E. long. 110° 26′. On the 24th our voyagers diſcovered the coaſt of "Van Diemen's" land, and on the 26th came to an anchor in "Adventure bay." While captain Cook was at this country, he neglected no inquiry which could promote the knowledge of navigation, and other branches of ſcience. He ſettled the latitude and longitude of places, marked the variations of the compaſs, and recorded the nature of the tides. Adventure bay he found to be ſituated in S. lat. 43° 21′ 20″, and E. long. 147° 29′. On the 30th of January he ſailed from this bay, and on the 12th of February came to his old ſtation in Queen Charlotte's Sound, in New Zealand. Here he found that ten men, who had ſeparated from captain Furneaux's crew in the former voyage, had been murdered by the natives, and that their fleſh had been conſumed as food. The fear of revenge rendered them very averſe from approaching the Engliſh veſſels. On the 27th captain Cook got clear of New Zealand; and having met with unfavourable winds, it was not till the 29th of March that he diſcovered land, which was found to be an inhabited iſland, called "Mangeea," in S. lat. 21° 57′. E. long. 201° 53′. Purſuing his voyage, on the 30th he again found land, which was an iſland, called by the natives "Wateeoo," in S. lat. 20° 1′. E. long. 201° 45′. The next place which he viſited was a ſmall iſland called "Wennooa-ette," or "Otakootaia," in S. lat. 19° 15′. E. long. 201° 37.′ On the 5th he directed his courſe to "Harvey's iſland," which he had diſcovered in 1773, and which he now found to be well peopled. Having by various adverſe circumſtances been ſo much retarded in his progreſs, that nothing could be done this year in the high latitudes of the northern hemiſphere, he determined to bear away for the Friendly iſlands, where he was ſure of being abundantly provided. Accordingly he reached Palmerſton iſland in his courſe, where he obtained ſome refreſhment; and after leaving this iſland, he ſteered to the weſt, with a view of making the beſt of his way to "Annamooka." On the 28th of April, he touched at the iſland of "Komango," and on the 1ſt of May arrived at Annamooka. The only interruption of the harmony that ſubſiſted between our voyagers and the natives of this iſland aroſe from the thieviſh diſpoſition of many of them. In order to correct and counteract this propenſity, captain Clerke invented a mode of treatment which produced ſome effect, the putting of the thieves into the hands of the barber, who completely ſhaved their heads. They thus became objects of ridicule to their countrymen, and their rogueries were reſtrained. Captain Cook having exhauſted Annamooka of its articles of food, propoſed, on the 11th, to proceed directly for "Tongataboo." But it was recommended to him to touch at another iſland, or rather a group of iſlands, called "Hapaee," lying to the N.E., where he might be plentifully ſupplied with every refreſhment in the eaſieſt manner. Hapaee was therefore choſen for the next ſtation, where our commander arrived on the 17th, and met with a moſt friendly reception. Here the captain took an opportunity of examining not only Hapaee, but "Lefooga," and other neighbouring iſlands. On the 10th of June he arrived at "Tongataboo;" where he was kindly received, but ſomewhat moleſted by the thieviſh propenſity of the inhabitants. On the 10th he left Tongataboo, and two days after came to an anchor in the iſland of "Middleburg," or "Eooa," as it is called by the inhabitants. Captain Cook remained at the Friendly iſlands between two and three months; and his intercourſe with the natives was little interrupted. This intercourſe was productive of many advantages. See Friendly *iſlands.* On the 17th of July, captain Cook reſumed his voyage; and on the 8th of Auguſt, an iſland was diſcovered, called by the natives "Toobouai," and ſituated in S. lat. 23° 25′. E. long. 210° 37′. Purſuing his courſe he reached Otaheite on the 12th, and ſteered for Oheitepeha bay, deſigning to anchor there before he went down to Matavai. Omai's reception among his countrymen was not entirely of a flattering nature. Nothing that was peculiarly ſtriking occurred at their firſt meeting; his interview with his ſiſter, however, was agreeable to the feelings of nature; and his aunt threw herſelf at his feet, and bedewed them with tears of joy. On the 24th, the captain reſumed his old ſtation in Matavai bay. On this viſit he was fully ſatisfied that human ſacrifices formed a part of the religious inſtitutions of Otaheite; for he was witneſs to a ſolemnity of this kind, which he has particularly deſcribed with the juſt ſentiments of indignation and abhorrence. Here the captain was cured of a rheumatic complaint, extending from the hip to the foot in an extraordinary manner. The mother of Otoo, a chief of the iſland, his three ſiſters, and eight other women, undertook the cure. Being deſired to lay himſelf down amongſt them, as many as could get round him began to ſqueeze him with both hands, from head to foot, but more particularly in the part where the pain was lodged, till they made his bones crack, and his fleſh became a perfect mummy. After undergoing this diſcipline about a quarter of an hour, he was glad to be releaſed from his female friends. The operation, however, gave him immediate relief, ſo that he was encouraged to ſubmit to another rubbing down before he went to bed; the conſequence of which was, that he was tolerably eaſy the whole ſucceeding night. His female phyſicians repeated their preſcription the next morning, and again in the evening; after which his pains were entirely removed, and the cure was perfected. This operation, which is called "Romee," is univerſally practiſed among theſe iſlanders: being ſometimes performed by the men, but generally by the women. During this viſit of our voyagers to Otaheite, ſuch a cordial friendſhip and confidence ſubſiſted between them and the natives, as never once to be interrupted by any untoward accident. From Otaheite our voyagers ſailed on the 30th to Eimeo, where they anchored. The tranſactions on this iſland were, upon the whole, unpleaſant. On the 11th of October, the ſhip left it, and next day arrived at Owharre harbour, on the weſt ſide of Huaheine. Here they ſettled Omai to mutual ſatisfaction; having procured for him a portion of land and built a houſe, on the outſide of which was this inſcription:

Georgius Tertius, Rex. 2 *Novembris*, 1777.
Naves, { *Reſolution, Jac. Cook, Pr.*
Diſcovery, Car. Clerke, Pr.

After parting with Omai in an affectionate manner, and leaving him comfortably ſettled among ſeveral of his relatives, captain Cook arrived at Bolabola, the laſt of the Society iſlands, which he viſited on the 8th of December. Upon the whole, it has been obſerved, that the future felicity of the inhabitants of Otaheite, and the Society iſlands, will not a little depend on occaſional viſits from Europe, for it would have been better for theſe poor people, as captain Cook ſays, never to have known our ſuperiority in the accommodations and arts which render life comfortable, than, after once knowing it, to be again abandoned to their original incapacity of improvement. On the 8th of December our commander ſailed from Bolabola, and in the night between the 22d and 23d, croſſed the line in E. long. 203° 15′, and on the 24th diſcovered land, which was called "Chriſtmas iſland," the weſt ſide of it, on which was obſerved an eclipſe of the ſun, being in N. lat. 1° 59′. E. long. 202° 30′. On the 2d of January 1778, the ſhips reſumed their courſe towards the north, and in their progreſs diſcovered three iſlands. On the 22d they touched at one of theſe iſlands, called by the natives "Atooi," and where captain Cook found the horrid practice of eating human fleſh, which the inhabitants denominated "ſavoury eating." But it was aſcertained that enemies ſlain in battle, are the ſole objects of this abominable cuſtom. Near this was another iſland, called "Oneeheow," where our commander anchored on the 29th. It is obſerved, that the iſlands in the Pacific ocean, which European voyagers have diſcovered, have generally been found to lie in groups, or cluſters. This was the caſe with thoſe that were now viſited; and to which captain Cook gave the name of "Sandwich iſlands," which ſee. On the 2d of February, our navigators purſued their courſe to the northward; and on the 7th of March they diſcovered the coaſt of "New Albion," the ſhips being then in N. lat. 44° 33′. E. long. 235° 20′. In ranging on the weſt ſide of America, captain Cook gave names to ſeveral capes and head lands, which appeared in ſight. At length, on the 29th he anchored in an inlet, where the country appeared full of mountains, with ſnow covering their ſummits, interſperſed with vallies which produced high ſtraight trees, exhibiting a beautiful proſpect, as of one vaſt foreſt. The ſhips were now in N. lat. 49° 29′. E. long. 232° 29′. The inhabitants on the coaſt appeared to be diſpoſed to maintain a friendly intercourſe with ſtrangers; and a trade immediately commenced, the articles of which were the ſkins of various animals, ſuch as bears, wolves, foxes, deer, rackoons, polecats, and martins; and, particularly, ſea-otters. Garments made of theſe were alſo offered for ſale; the moſt extraordinary articles, however, were human ſkulls, and hands not quite ſtripped of their fleſh, ſome of which exhibited marks of having been upon the fire. In exchange the natives took knives, chiſſels, pieces of iron and tin, nails, looking-glaſſes, buttons, or any kind of metal. Although commerce was, in general, carried on with mutual honeſty, ſome of theſe people were no leſs inclined to theft than the iſlanders in the Southern ocean. Of all the uncivilized tribes, which our commander met with in his various navigations, he never found any who had ſuch ſtrict notions of their right to the excluſive property of every thing which their country produced, as the inhabitants of the Sound where he was now ſtationed. With captain Cook, very much to the honour of his character and of his country, it was a ſacred rule never to take any part of the property of the people whom he viſited, without an ample compenſation. Whilſt the ſhips were under repair for the proſecution of the expedition, our captain improved every opportunity that occurred for extending his knowledge of the manners and cuſtoms of the inhabitants, who, in general, treated him with great civility. The natives were much addicted to ſinging; and in ſome inſtances, the whole body joined, ſome in a ſlow, and others in a quicker time; accompanying their notes with the moſt regular motions of their hands, or with beating in concert with their paddles, on the ſides of the canoes, to which were added other very expreſſive geſtures. At the end of each ſong, they continued ſilent for a few moments, and then began again, ſometimes pronouncing the word *Hooee!* forcibly as a chorus. At our captain's firſt arrival in this inlet, he denominated it "King George's Sound;" but he afterwards was informed that the natives called it "Nootka." The entrance of the Sound is ſituated in the eaſt corner of Hope bay, in N. lat. 49° 53′. E. long. 233° 12′. On the 26th the repairs of the ſhips being completed, every thing was ready for the captain's departure. In the proſecution of the voyage to the north, and back again to the Sandwich iſlands, the incidents that occurred were chiefly of a nautical kind. The firſt place at which captain Cook landed, after his departure from Nootka Sound, was an iſland which he called "Kaye's iſland," ſituated at its S.W. point in N. lat. 59° 49′. E. long. 216° 58′. To an inlet in which the ſhips anchored on the 12th, he gave the appellation of "Prince William's Sound." Some days after leaving this Sound, our navigators came to an inlet, which they hoped would be found to communicate with the ſea to the north, or with Baffin's or Hudſon's bay to the eaſt; and therefore they determined particularly to examine it. In conſequence of a complete inveſtigation of this inlet, it was diſcovered to be a river, which was afterwards called "Cook's river." On the 6th of June they got clear of this river, and purſuing their voyage, they ſailed on the 19th, amidſt the group of iſlands, which had been called by Beering "Schumagin's iſlands." On the 21ſt, among ſome hills, on the main land, that towered above the clouds to a moſt amazing height, one was diſcovered to have a volcano, which continually threw up vaſt columns of ſmoke. It does not ſtand far from the coaſt, and is ſituated in N. lat. 54° 48′, and long. 195° 45′. The mountain is of a completely conical figure, and the volcano is at its very ſummit. A canoe, from an iſland in the neighbourhood, approached the ſhip, and the ſingle perſon on board bowed as he came near. From ſuch tokens of politeneſs, our captain reaſonably inferred, that the Ruſſians muſt have ſome communication and traffic with theſe people. On the 27th our voyagers reached an iſland, known by the name of "Oonalaſhka," the inhabitants of which behaved with a degree of politeneſs uncommon to ſavage tribes. The harbour of "Samgamooda," on the north ſide of the iſland, in which captain Cook came to an anchor, is ſituated in N. lat. 53° 55′. E. long. 193° 30′. On the 2d of July our voyagers left Oonalaſhka, and on the 16th were within ſight of a promontory, on which lieutenant Williamſon landed; but he found that the land, as far as his view extended, produces neither tree nor ſhrub, though the lower grounds were not deſtitute of graſs, and of ſome other plants. To this promontory, in N. lat. 58° 42′. E. long. 197° 36′, was given the name of "Cape Newenham." When our navigators, on the 3d of Auguſt, had advanced to the latitude of 62° 34′, they had the misfortune to loſe Mr. Anderſon, the ſurgeon of the Reſolution, who had for more than twelve months been lingering under a conſumption. Mr. Anderſon, who was a perſon of a cultivated underſtanding and agreeable manners, to diſtinguiſhed ſkill in his own profeſſion, added a very conſiderable knowledge in other branches of ſcience. An iſland, diſcovered ſoon after his death, was honoured with the appellation of "Anderſon's iſland." On the 9th captain Cook anchored under a point of land, to which he gave the name of "Cape Prince of Wales," ſituated in N. lat. 65° 46′. E. long. 191° 45′, and remarkable for being the moſt weſtern extremity of America hitherto explored. This extremity is diſtant from the eaſtern cape of Siberia only 13 leagues; and there our commander had the glory of aſcertaining the vicinity of the two continents, which had only been conjectured from the reports of the neighbouring Aſiatic inhabitants, and the imperfect obſervations of the Ruſſian navigators. Reſuming his courſe on the 10th, captain Cook anchored in a bay, the land of which was at firſt ſuppoſed to be a part of the iſland "Alaſchka;" but from the figure of the coaſt, from the ſituation of the oppoſite ſhore of America, and from the longitude, the captain thought to be more probably the country of the "Tſchutſki," on the eaſtern extremity of Aſia, which had been explored by Beering in 1728; and this was found to be the fact. From the bay of St. Lawrence, belonging to the country of the Tſchutſki, our navigators ſteered, on the 11th, to the eaſt, in order to get nearer to the coaſt of America. Afterwards, proceeding to the north, they reached, on the 17th, the latitude of 70° 33′, in longitude 197° 41′. On this day a brightneſs was perceived in the northern horizon, reſembling that which is reflected from ice, and which is commonly called the *blink*. In about an hour's time, the ſight of a large field of ice removed all doubt in captain Cook's mind with reſpect to the cauſe of the brightneſs of the horizon. The ſhips were ſoon cloſe to the edge of the ice, in lat. 70° 41′, and unable to proceed any farther. On the 18th, in lat. 70° 44′, the ice near them was as compact as a wall, and judged to be at leaſt ten or twelve feet high. Farther to the north, it appeared much higher. A prodigious number of ſea-horſes lay upon the ice; and ſome of them were procured for food, in order to ſupply the want of freſh proviſions. Our voyagers lived on the ſea-horſes as long as they laſted; and they were generally preferred to ſalt proviſions. Captain Cook continued, until the 29th, to traverſe the Icy ſea beyond Beering's ſtrait, in various directions, and through numberleſs obſtructions and difficulties. The ſeaſon, indeed, was now ſo far advanced, that it would have been highly imprudent to have made any farther attempts, till the next ſummer, at finding a paſſage into the Atlantic. Our commander's attention was now directed to the diſcovery of a proper place for obtaining a ſupply of wood and water; and to the manner in which he ſhould ſpend the winter, with ſome improvements in geography and navigation, and ſo as to be in a condition to return to the north, for a farther ſearch of a paſſage, in the enſuing ſummer. Before he proceeded to the ſouth, he employed a conſiderable time in examining the ſea and coaſts in the vicinity of Beering's ſtrait, on the ſide both of Aſia and America. In this examination, he aſcertained the accuracy of Beering, ſo far as he went; demonſtrated the errors with which Stæhlin's map of the new northern Archipelago abounds; and made large additions to the geographical knowledge of this part of the world. “It reflects,” as Mr. Coxe juſtly obſerves, “the higheſt honour even on the Britiſh name, that our great navigator extended his diſcoveries much farther in one expedition, and at ſo great a diſtance from the point of his departure, than the Ruſſians accompliſhed in a long ſeries of years, and in parts belonging or contiguous to their own empire.”

On the 2d of October, our voyagers came within ſight of the iſland of Oonalaſhka, and anchored again in Samganoodah harbour. Here, whilſt the ſhips were repairing, the ſeamen collected berries, with which the iſland abounds, and which, in conjunction with the ſpruce-beer, contributed effectually to eradicate every ſeed of the ſcurvy that might exiſt in either of the veſſels. They alſo procured an ample ſupply of fiſh. Captain Cook, on the 8th, received a very ſingular preſent, which was a rye-loaf, or rather a pye in the form of a loaf, for it incloſed ſome ſalmon, highly ſeaſoned with pepper. Captain Clerke received alſo the ſame kind of preſent. Theſe preſents, it was reaſonably ſuppoſed, came, by the hands of an Oonalaſhkan, from ſome Ruſſians in the neighbourhood. On the 10th corporal Lediard of the marines returned from his reſearches with three Ruſſian ſeamen, or furriers, who, with ſeveral others, reſided at “Engooehſhar,” where they had a dwelling-houſe, ſome ſtore-houſes, and a ſloop of about 30 tons burthen. From theſe perſons captain Cook derived every poſſible degree of information. Afterwards, another Ruſſian was introduced to our captain, whoſe name was Eraſim Gregorioff Sin Iſmyloff, and who was the principal perſon among his countrymen in this and the neighbouring iſlands. From him he obtained two charts, which he was permitted to copy. The firſt included the “Penſhinkian” ſea; the coaſt of Tartary, down to the latitude of 41°; the Kuril iſlands; and the peninſula of Kamtſchatka. The ſecond chart, which was the moſt intereſting, comprehended all the diſcoveries made by the Ruſſians to the eaſtward of Kamtſchatka, towards America; which, however, excluſively of the voyages of Beering and Tſcherikoff, amounted to little or nothing. Indeed captain Cook was aſſured, that no Ruſſians had even ſeen any part of the continent of America to the northward, excepting that which lies oppoſite to the country of the Tſchutkis. On the 26th, all things being ready for captain Cook's departure, he put to ſea, and ſailed for the Sandwich iſlands; it being his intention to ſpend a few months there, and then to direct his courſe to Kamtſchatka, ſo as to endeavour to reach that country by the middle of May, in the enſuing ſummer. On the 26th of November, when the ſhips had proceeded ſouthward to the latitude of 20° 55′, land was diſcovered, which proved to be the iſland of “Mowee,” one of the group of the Sandwich iſlands, with the inhabitants of which a friendly intercourſe was maintained. Another iſland was diſcovered on the 30th, called by the natives “Owhyhee.” Among the articles procured from the natives, was a quantity of ſugar-cane, a ſtrong decoction of which was found, upon trial, to be a very palatable beer; more eſpecially when improved with a few hops. On the 16th of January 1779, canoes in great numbers came out from all parts of the iſland, ſo that the two ſhips were ſurrounded with no fewer than a thouſand, crowded with people and laden with hogs, and other productions of the iſland. Some of them, however, manifeſted a thieviſh diſpoſition, and captain Cook, in order to check it, ordered two or three muſkets, and as many four pounders, to be fired over one of the canoes, which had carried away a rudder. Into a bay, affording good anchorage and freſh water, captain Cook reſolved to take the ſhips in order to refit, and to obtain every refreſhment which the place could afford. The bay in which the ſhips anchored on the 17th was called by the inhabitants “Karakakooa.” The veſſels were ſoon ſurrounded with a multitude of canoes; and the whole ſhore of the bay was covered with ſpectators, whilſt many hundreds were ſwimming round the ſhips like ſhoals of fiſh. Our navigators were much impreſſed by the ſingularity of the ſcene; and few of them lamented their unſucceſsful endeavours of getting homeward, the laſt ſummer, by a northern paſſage. “To this diſappointment,” ſays the captain, “we owed our having it in our power to reviſe the Sandwich iſlands, and to enrich our voyage with a diſcovery, which, though the laſt, ſeemed, in many reſpects, to be the moſt important that had hitherto been made by Europeans, throughout the extent of the Pacific ocean.” Such, alas! is the concluding ſentence of our illuſtrious commander's journal. Little did he then imagine, that a diſcovery which promiſed to annex no ſmall honour to his name, and to be productive of very agreeable conſequences, would be ſo fatal in the reſult. Little did he think, that the iſland of Owhyhee was deſtined to be the laſt ſcene of his exploits and the cauſe of his deſtruction.

The reception which the captain met with from the natives, on his proceeding to anchor in Karakakooa bay, was in a very high degree encouraging. The natives expreſſed their joy by ſinging and ſhouting, and by exhibiting a variety of wild and extravagant geſtures. During the long cruiſe of our navigators off the iſland of Owhyhee, the inhabitants had conducted themſelves in their dealings, almoſt univerſally, with fairneſs and honeſty; but after the arrival of the ſhips in the bay, they altered their conduct. The immenſe crowds of iſlanders that encompaſſed the ſhips afforded frequent opportunities of pilfering without the riſk of detection, and held out, eſpecially as their number was much ſuperior to that of the Engliſh, the proſpect of eſcaping with impunity. Another circumſtance to which the alteration in the conduct of the natives may be aſcribed, aroſe from the preſence and encouragement of their chiefs, into whoſe poſſeſſion the booty might be traced, and who were probably the inſtigators of the depredations that were committed. Soon after the Reſolution had gotten into her ſtation, three chiefs, one of whom named Koah, who was a prieſt, and in his youth had been a diſtinguiſhed warrior, viſited the ſhip; and in the evening, captain Cook, accompanied by Mr. Bayley and Mr. King, attended him on ſhore. The captain was received with great civility and a reſpect, on the part of the natives, approaching to adoration. The captain was particularly deſirous of procuring from the iſland ſome ſalted hogs for ſea-ſtore; and, with this view, of renewing former attempts in the operation for this purpoſe. The event anſwered his moſt ſanguine expectations. On the 26th captain Cook had his firſt interview with Terreeoboo, the king of the iſland; which was conducted with a variety of ceremonies, among which, the cuſtom of exchanging names, which among the iſlanders of the Pacific ocean is the ſtrongeſt pledge of friendſhip, was obſerved. The king, attended by ſeveral chiefs, was conducted in a pinnace on board the Reſolution; where they were received, apparently much to their ſatisfaction, with peculiar attention and reſpect. In the progreſs of the intercourſe which was carried on between our voyagers and the natives, the quiet and inoffenſive behaviour of the latter took away every apprehenſion of danger and inſpired an unſuſpecting confidence in the Engliſh. A ſociety of prieſts, in particular, diſplayed a generoſity and munificence, of which there are few examples; for they furniſhed a conſtant ſupply of hogs and vegetables to our navigators, without ever demanding, or even ſuggeſting, a return. Indeed, the conduct of the warrior chiefs, or *Earees*, was always leſs ſatisfactory than that of the prieſts. Although the kind and liberal behaviour of the natives continued without remiſſion, Terreeoboo, and his chiefs, began at length to be very inquiſitive about the time of the departure of the Engliſh; but this is not ſurpriſing, when we conſider the enormous conſumption of hogs and vegetables, which had taken place during their abode of 16 days in the bay. When the king was informed that they were to leave the iſland in a day or two, a proclamation was made through the iſland, requiring the people to bring their hogs and vegetables, that they might be preſented by the king to the *Orono*, the title of reſpect given to captain Cook, on his quitting the country. Accordingly, on the 3d of February, being the day preceding that which was fixed for leaving the iſland, Terreeoboo invited captain Cook and Mr. King to attend him to the place where Kaoo reſided. On their arrival, they found the adjoining ground covered with parcels of cloth, and at a little diſtance an immenſe quantity of vegetables; and near them was a large herd of hogs. At the cloſe of the viſit a great part of the cloth, and all the vegetables and hogs were given by Terreeoboo to captain Cook and Mr. King, who were aſtoniſhed at the value of the preſent. Such was the attachment of the inhabitants of Owhyhee to Mr. King, that Terreeoboo and Kaoo waited upon captain Cook, whoſe ſon they ſuppoſed him to be, to ſolicit his reſidence in their country. Early on the 4th the ſhips ſailed out of Karakakooa bay, being followed by a large number of canoes. It was the captain's deſign, before he viſited the other iſlands to make a complete ſurvey of Owhyhee, in hopes of finding a better ſheltered bay than that which he had left; and upon failure of ſucceſs to take a view of the ſouth-eaſt part of Mowee, where, as he was informed, he might find an excellent harbour. After ſailing about the iſland of Owyhee for ſeveral days, the weather being ſtormy, and the foremaſt of the Reſolution being damaged, our navigators returned on the 11th to Karakakooa bay; but in coming to an anchor, they found their reception to be very different from what it had been on their firſt arrival. Their anxiety, however, was in ſome meaſure relieved, by the return of a boat which had been ſent on ſhore, and which brought information, that Terreeoboo was abſent, and had left the bay under the *Taboo*. The behaviour of the natives, however, appeared myſterious and excited ſuſpicion; the interdiction of intercourſe, on pretence of the king's abſence, afforded reaſon for apprehending that he only wiſhed to gain time for conſulting with his chiefs. On the next morning Terreeoboo arrived and immediately viſited captain Cook; this circumſtance, and the return of the natives to their uſual friendly intercourſe, were conſidered as ſtrong proofs, that they neither meant, nor apprehended, any change of conduct. Some other incidents confirmed this opinion. Towards the evening of the 13th information was received, that ſeveral chiefs aſſembled at the well near the beach and drove away the natives who had been hired to aſſiſt the ſailors in rolling down the caſks to the ſhore. It was afterwards found, that the iſlanders had armed themſelves with ſtones and were very tumultuous. Not to mention ſome inſtances of theft and ſubſequent diſſenſions which occurred, one of a very ſerious and unpleaſant nature happened, which it may not be improper to ſpecify on account of the conſequences that enſued. A canoe, belonging to Pareea, was ſeized; and he, proteſting his innocence with regard to the theft that had been committed, claimed his property. A ſcuffle took place between him and the Engliſh officer with ſome of his companions, in which Pareea was knocked down by a violent blow on the head, with an oar. The natives, who had been peaceable ſpectators, immediately attacked the Engliſh ſeamen with a ſhower of ſtones, which obliged them precipitately to retreat and to ſwim off to a rock at ſome diſtance from the ſhore. The pinnace, which was waiting for captain Cook's return, was immediately ranſacked by the iſlanders; and if it had not been for the ſeaſonable interpoſition of Pareea, would have been entirely demoliſhed, Pareea interfered further in reſtoring the pinnace; and being aſſured that he would be kindly received by the *Orono*, joined noſes (according to their cuſtom) with the officers, in token of friendſhip, and paddled over to the village of Kowrowa. Captain Cook, on being informed of this occurrence, expreſſed much uneaſineſs: "I am afraid," ſays he, "that theſe people will oblige me to uſe ſome violent meaſures; for," he added, "they muſt not be left to imagine, that they have gained an advantage over us." The confidence of our navigators in the natives gradually abated; and they thought it neceſſary to be very much upon their guard. At this time the cutter belonging to the Diſcovery was ſtolen, and captain Cook made the neceſſary preparations for the recovery of it. On occaſions of a ſimilar kind, it had been his practice to get the king, or ſome of the principal *Erees*, on board, and to detain them as hoſtages till the article, that had been loſt, was reſtored. This method he meant now to purſue; and he alſo gave orders to ſtop all the canoes that ſhould attempt to leave the bay, with an intention of ſeizing and deſtroying them, if by peaceable means he could not recover the cutter. Captain Cook and Mr. King, together with Mr. Philips, and nine marines, left the ſhip; and when they landed, the captain inſtructed Mr. King to quiet the minds of the natives, by aſſuring them they ſhould not be hurt, to keep his people together, and to be on his guard. Whilſt Mr. King was employed in executing his commiſſion, captain Cook proceeded to Kowrowa, where the king reſided, and landed with the lieutenant and nine marines. The people received him with the uſual tokens of reſpect; proſtrating themſelves before him, and bringing their cuſtomary offerings of ſmall hogs. Having gained an interview with Terreeoboo, he invited him to return in the boat, and ſpend the day on board the Reſolution. To this propoſal the old king aſſented, and immediately accompanied him. One of the king's favourite wives, however, beſought him, with many tears and intreaties, not to go on board; and two chiefs, who accompanied her, forced him to ſit down. The natives, who were collecting in great numbers on the ſhore, and who had been alarmed by the hoſtilities that had previouſly occurred in the bay, thronged round captain Cook and their king. The lieutenant of marines, perceiving that they were much preſſed, and thus rendered incapable of uſing their arms, if occaſion ſhould require it, propoſed to the captain to draw them up along the rocks, cloſe to the water's edge; and accordingly they formed a line, at the diſtance of about 30 yards from the place where the king was ſitting. The old king appeared to be much alarmed; and when captain King urged him to proceed, the chiefs interpoſed, and at firſt by prayers and intreaties, and afterwards by force and violence, inſiſted on his ſtaying where he was. The captain at length deſiſted; obſerving to Mr. Philips, that it would be impoſſible to compel him to go on board, without the riſk of killing a great number of the inhabitants. Captain Cook's perſon had hitherto appeared to be in no danger; but a circumſtance accidentally occurred, which gave a fatal turn to his ſituation. The boats, which had been ſtationed acroſs the bay to prevent the eſcape of the canoes, fired at ſome of them that were endeavouring to go off, and unfortunately killed a chief of the firſt rank. The news of his death arrived at the village, where captain Cook was, juſt as he had left the king, and was walking ſlowly toward the ſhore. Upon this, the women and children were immediately ſent off; and the men put on their war-mats, and armed themſelves with ſpears and ſtones. One of the natives, having in his hands a ſtone, and a long iron ſpike (called a *pahooa*), advanced to the captain, flouriſhing his weapon in defiance, and threatening to throw the ſtone. The captain, after having ineffectually deſired him to deſiſt, fired a load of ſmall ſhot, which, as the man had on his war-mat, ſerved only to irritate and encourage the enraged people. Several ſtones were thrown at the marines; and one of the *Erees* attempted to ſtab Mr. Philips with his *pahooa*, but failed in the attempt. Captain Cook now fired his ſecond barrel, loaded with ball, and killed one of the foremoſt of the natives. A general attack with ſtones immediately followed, which was returned by a diſcharge of muſquetry from the marines, and the people in the boats. The iſlanders, contrary to expectation, ſtood the fire with great firmneſs; and before the marines had time to reload, broke in upon them with dreadful ſhouts and yells. Four marines were cut off among the rocks, in their retreat; three more were dangerouſly wounded; and the lieutenant, who had received a ſtab between the ſhoulders with a *pahooa*, having fortunately reſerved his fire, ſhot the man who had wounded him, juſt as he was going to repeat his blow. The unfortunate commander, the laſt time in which he was diſtinctly ſeen, was ſtanding at the water's edge, and calling out to the boats to ceaſe firing, and to pull in. If it be true, as ſome of thoſe who were preſent imagined, that the mariners and boatmen had fired without his orders, and that he was deſirous of preventing any further bloodſhed, it is not improbable that his humanity, on this occaſion, proved fatal to him. For it was remarked, that whilſt he faced the natives, none of them had offered him any violence; but that having turned about, to give his orders to the boats, he was ſtabbed in the back, and fell with his face into the water. On ſeeing him fall, the iſlanders ſet up a great ſhout, and his body was immediately dragged on ſhore, and ſurrounded by the enemy, who, ſnatching the dagger out of each other's hands, ſhewed a ſavage eagerneſs to have a ſhare in his deſtruction. "Thus fell," ſays captain King, "our great and excellent commander!" For other particulars, we refer to "Samwell's Narrative of the Death of Captain Cook."

In conſequence of the ſavage diſpoſition of the natives, the whole remains of captain Cook could not be recovered. Although various means, ſoothing and menacing, were employed for this purpoſe, little more than the principal part of the bones could be procured. By the poſſeſſion of theſe, our navigators were enabled to perform the laſt offices to their eminent and unfortunate commander. The bones, having been put into a coffin, and the ſervice being read over them, were committed to the deep, on the 21ſt, with the uſual military honours. What were the feelings of the companies of both the ſhips, on this occaſion, the world muſt be left to conceive; for thoſe who were preſent know, that it is not in the power of any pen to deſcribe them.

Such was the high eſtimation in which the character and enterpriſes of captain Cook were held by neighbouring nations, that, when war was declared between France and England, a letter was iſſued, on the 15th of March, 1779, by Monſ. Sartine, ſecretary of the marine department at Paris, and ſent to all the commanders of the French ſhips, which, after doing honour to the importance and utility of his diſcoveries, ordered, that the ſhip of captain Cook ſhould be treated with reſpect at ſea. The adoption of this meaſure was ſuggeſted by Monſ. Turgot, who alſo compoſed a memorial, in which he proved that honour, reaſon, and even intereſt, dictated this act of reſpect for humanity; and it was in conſequence of this memorial, as we learn from M. Condorcet (in his Life of M. Turgot), that an order was given not to treat as an enemy the common benefactor of every European nation. The firſt thought of ſuch a plan of conduct was very probably ſuggeſted by Dr. Benjamin Franklin, who, when he was ambaſſador at Paris from the United States of America, preceded the court of France in iſſuing a ſimilar requiſition.

We ſhall cloſe this article, as far as it reſpects the diſcoveries of captain Cook, with merely mentioning, that the Sandwich iſlands were further explored; that Kamtſchatka was viſited, and a very friendly intercourſe maintained with the Ruſſian officers of that country; that our navigators experienced the moſt generous and hoſpitable treatment from major Behm, in particular, the commander of the garriſon at Bolcharetſk; that they proceeded to the north, in purſuit of the grand object of the expedition; that, having paſſed through Beering's ſtrait, and attained to ſomewhat more than 69½ degrees of northern latitude, they found it abſolutely impoſſible to penetrate through the ice, either on the ſide of America or on the ſide of Aſia; that every hope being precluded of accompliſhing, in this way, a paſſage into the Atlantic ocean, captain Clerke was obliged to come to the determination of ſailing back to the ſouthward; that on the 22d of April (1779) the captain died of a conſumption (ſee his article); that captain Gore ſucceeded to the command of the Reſolution, and lieutenant King to that of the Diſcovery; that a ſecond viſit was paid to Kamtſchatka, which extended our acquaintance with that part of the world; that no ſmall acceſſion of information was acquired, with reſpect to geographical ſcience in general; that our voyagers purſued their courſe by the coaſts of Japan and China; that they made ſome ſtay at Canton; that thence they proceeded to the Cape of Good Hope; that they came to an anchor at Stromneſs, on the 22d of May, 1780; that both ſhips arrived at the Nore, on the 4th of October, after an abſence of 4 years, 2 months, and 22 days; that, during the whole of the expedition, the Reſolution loſt only five men by ſickneſs, three of whom were in a precarious ſtate of health at their departure from England, while the Diſcovery did not loſe a ſingle man; and that the hiſtory of the voyage, from the time in which captain Cook's journal ends, was written with great ability by Mr. King. By the deceaſe of captain King, who died at Nice in Italy, in 1784, this country ſuſtained another loſs of an able and ſcientific commander and navigator, who hath left a memorial of his talents and ſervices, which has honourably united his name with that of the immortal Cook.

In ſketching the talents and character of captain Cook, ſtrikingly illuſtrated in the actions and enterpriſes of his life, we ſhall avail ourſelves of the aſſiſtance that is afforded us by his profeſſed or incidental biographers. Captain Cook poſſeſſed, in an eminent degree, an inventive mind, which, by its native vigour, ſuggeſted noble objects of purſuit, and the moſt effectual methods of proſecuting and attaining them. This faculty he exemplified in a great variety of critical and difficult ſituations. To this kind of genius he added unwearied application. By his genius and unremitting aſſiduity he acquired an extenſive acquaintance, not only with navigation, but with many other ſciences. He was ſo well informed with regard to different branches of the mathematics, and particularly in aſtronomy, that he was able to take the lead in various obſervations of an aſtronomical kind, in the courſe of his voyages. In general literature, and even the art of compoſition, he was ſo great a proficient, that he acquired reputation, not merely as the performer, but as the narrator, of his various intereſting enterpriſes. Perſeverance and ſteadineſs in the proſecution of the objects to which his life was devoted, were diſtinguiſhing features of his character; and ſuch was the invincible fortitude of his ſpirit, that no difficulties or dangers intimidated him, or deterred him from accompliſhing any purpoſe which he formed, or which the hazardous ſervices aſſigned him required. His fortitude was of courſe accompanied with complete ſelf-poſſeſſion. This latter quality was eminently uſeful to him in many critical and trying circumſtances. Accordingly it is obſerved, that the calmneſs and compoſure of his mind were ſuch, that, after having given neceſſary directions, he could take his reſt, and ſleep during the hours which he allotted to himſelf with perfect ſoundneſs. To the great qualities poſſeſſed by captain Cook, he added the moſt amiable and conciliatory virtues. His humanity is illuſtrated in the whole courſe of his conduct, during his ſucceſſive voyages; with regard to the inhabitants of the countries which he viſited, and with reſpect to the accommodation, health, and comfort of his own ſeamen. In the private relations of life, he maintained an excellent and exemplary character, as a huſband and father, and as a ſincere and ſteady friend: and his ſobriety and virtue gave ſtability and ſecurity to every other moral qualification. He was alſo diſtinguiſhed by the ſimplicity of his manners. In converſation he was unaffected and unaſſuming; and yet, on neceſſary occaſions, obliging and communicative. To this general account of his talents and virtues, we ſhall ſubjoin ſome delineations of his character by thoſe who were in habits of intimate acquaintance with him, and who had an opportunity of marking his temper and conduct in the various trying circumſtances that occurred in the courſe of his life. Captain King, the continuator of the journal of his laſt voyage, has given us the following ſketch of his character: "The conſtitution of his body was robuſt, inured to labour, and capable of undergoing the ſevereſt hardſhips. His ſtomach bore, without difficulty, the coarſeſt and moſt ungrateful food. Indeed temperance in him was ſcarcely a virtue; ſo great was the indifference with which he ſubmitted to every kind of ſelf-denial. The qualities of his mind were of the ſame hardy, vigorous kind with thoſe of his body. His underſtanding was ſtrong and perſpicacious; his judgment, in whatever related to the ſervices he was engaged in, quick and ſure. His deſigns were bold and manly; and both in the conception, and in the mode of execution, bore evident marks of a great original genius. His courage was cool and determined, and accompanied with an admirable preſence of mind in the moment of danger. His manners were plain and unaffected. His temper might perhaps have been juſtly blamed, as ſubject to haſtineſs and paſſion, had not theſe been diſarmed by a diſpoſition the moſt benevolent and humane. Such were the outlines of captain Cook's character; but its moſt diſtinguiſhed feature was that unremitting perſeverance in the purſuit of his object, which was not only ſuperior to the oppoſition of dangers, and the preſſure of hardſhips, but even exempt from the want of ordinary relaxation. During the long and tedious voyages in which he was engaged, his eagerneſs and activity were never in the leaſt abated. No incidental temptation could detain him for a moment; even thoſe intervals of recreation, which ſometimes unavoidably occurred, and were looked for by us with a longing, that perſons, who have experienced the fatigues of ſervice, will readily excuſe, were ſubmitted to by him with a certain impatience, whenever they could not be employed in making further proviſion for the more effectual proſecution of his deſigns." (See King's Voyage, vol. iii. p. 48, 49.) Mr. Samwell has alſo annexed ſome particulars, relative to the life and character of captain Cook, to the "Narrative of his Death." Dr. Reinhold Forſter has alſo, with ſome abatement, paſſed an eulogium on his character, in his "Hiſtory of the Voyages and Diſcoveries made in the North." The following tribute to his memory, —the memory of "the ableſt and moſt renowned navigator this or any country hath produced," is drawn up by one of his own profeſſion, of whom it is ſaid, that he is not more diſtinguiſhed by the elevation of rank, than by the dignity of private virtues. (See Introduction to Cook's third Voyage, vol. i. p. 85—87, &c.) Captain James Cook, ſays this writer, "poſſeſſed, in an eminent degree, all the qualifications requiſite for his profeſſion and great undertakings; together with the amiable and worthy qualities of the beſt men. Cool and deliberate in judging; ſagacious in determining; active in executing; ſteady and perſevering in enterpriſing from vigilance and unremitting caution: unſubdued by labours, difficulties, and diſappointments: fertile in expedients: never wanting preſence of mind: always poſſeſſing himſelf, and the full uſe of a ſound underſtanding. Mild, juſt, but exact in diſcipline: he was a father to his people, who were attached to him from affection, and obedient from confidence. His knowledge, his experience, his ſagacity, rendered him ſo entirely maſter of his ſubject, that the greateſt obſtacles were ſurmounted, and the moſt dangerous navigations became eaſy, and almoſt ſafe, under his direction. He explored the ſouthern hemiſphere to a much higher latitude than had been ever reached, and with fewer accidents than frequently befal thoſe who navigate the coaſts of this iſland. By his benevolent and unabating attention to the welfare of his ſhip's company, he diſcovered and introduced a ſyſtem for the preſervation of the health of ſeamen in long voyages, which has proved wonderfully efficacious; for in his ſecond voyage round the world, which continued upwards of three years, he loſt only one man by diſtemper, of 118, of which his company conſiſted. The death of this eminent and valuable man was a loſs to mankind in general; and particularly to be deplored by every nation that reſpects uſeful accompliſhments, that honours ſcience, and loves the benevolent and amiable affections of the heart. It is ſtill more to be deplored by this country, which may juſtly boaſt of having produced a man hitherto unequalled for nautical talents; and that ſorrow is farther aggravated by the reflection, that his country was deprived of this ornament by the enmity of a people, from whom, indeed, it might have been dreaded, but, from whom it was not deſerved. For, actuated always by the moſt attentive care and tender compaſſion for the ſavages in general, this excellent man was ever aſſiduouſly endeavouring, by kind treatment, to diſſipate their fears and court their friendſhip; overlooking their thefts and treacheries, and frequently interpoſing, at the hazard of his life, to protect them from the ſudden reſentment of his own injured people. The object of his laſt miſſion was to diſcover and aſcertain the boundaries of Aſia and America, and to penetrate into the northern ocean by the N. E. Cape of Aſia.

Traveller! contemplate, admire, revere, and emulate this great maſter in his profeſſion; whoſe ſkill and labours have enlarged natural philoſophy; have extended nautical ſcience; and have diſcloſed the long unſealed and admirable arrangement of the Almighty, in the formation of this globe, and, at the ſame time, the arrogance of mortals, in preſuming to account, by their ſpeculations, for the laws by which he was pleaſed to create it. It is now diſcovered, beyond all doubt, that the ſame great being who created the univerſe by his *fiat*, by the ſame ordained our earth to keep a juſt poiſe, without a correſponding ſouthern continent—and it was ſo! "*He ſtretches out the north over the empty place, and hangeth the earth upon nothing.* Job. xxxvi. 7. If the arduous but exact reſearches of this extraordinary man have not diſcovered a new world, they have diſcovered ſeas unnavigated and unknown before. They have made us acquainted with iſlands, people, and productions, of which we had no conception. And if he has not been ſo fortunate as Americus to give his name to a continent, his pretenſions to ſuch a diſtinction remain unrivalled; and he will be revered, while there remains a page of his own modeſt account of his voyage, and as long as mariners and geographers ſhall be inſtructed, by his new map of the ſouthern hemiſphere, to trace the various courſes and diſcoveries he has made. If public ſervices merit public acknowledgments; if the man who adorned and raiſed the fame of his country, is deſerving of honour, then captain Cook deſerves to have a monument raiſed to his memory, by a generous and grateful nation.

Virtutis uberrimum alimentum eſt honos.

Val. Max. l. ii. c. 6.

From the numerous poetical tributes, paid to the memory of captain Cook, by our elegant female writers, we muſt confine ourſelves to a ſingle extract from Miſs Hannah More's poem on "Slavery."

"Had thoſe advent'rous ſpirits who explore
Thro' ocean's trackleſs waſtes, the far-ſought ſhore,
Whether of wealth inſatiate, or of power,
Conquerors who waſte, or ruffians who devour:
Had theſe poſſeſs'd, O Cook! thy gentle mind,
Thy love of arts, thy love of human-kind;
Had theſe purſu'd thy mild and liberal plan,
Discoverers had not been a curſe to man!
Then, bleſs'd Philanthropy! thy ſocial hands
Had link'd diſſever'd worlds in brother's bands;
Careleſs, if colour, or if clime divide;
Then lov'd, and loving, man had liv'd, and died."

Miſs Seward's admirable poem in celebration of captain Cook's memory would have furniſhed many pleaſing extracts, if our limits allowed our farther enlarging on this intereſting article; but we muſt refer the reader to this lady's elegy on the occaſion.

The Royal Society teſtified their reſpect for the memory of their illuſtrious member by medals, ſtruck on this occaſion, ſome of gold, others of ſilver, and others of bronze; the expence of which was defrayed by ſubſcription. On one ſide is the head of captain Cook in profile, and round it, Jac. Cook oceani investigator acerrimus; and on the exergue, Reg. Soc. Lond. Socio suo. On the reverſe is a repreſentation of Britannia, holding a globe; round her is inſcribed, Nil intentatum nostri liquere; and on the exergue, Auspiciis Georgii III.

Among the numerous teſtimonies of regard that have been rendered to the merits and memory of captain Cook, the important object of providing for his family hath not been forgotten. Soon after his death was known, the lords of the admiralty preſented a memorial to his majeſty; and he was pleaſed, by the advice of his privy council, to order a penſion of 200*l.* a year to be ſettled on the widow, and 25*l.* a year to each of the three ſons of the captain. A conſiderable benefit alſo redounded to his family from the ſale of the charts and plans, belonging to the voyage to the Pacific ocean, which were provided at the expence of government. On September the 3d, 1785, a coat of arms was granted to the family, with an appropriate device. Our navigator had ſix children. On the ſubject of this article ſee the firſt, ſecond, and third voyages of Cook; the firſt included in Hawkeſworth's Voyages, publiſhed in 3 vols. 4to, 1773. The ſecond, written by captain Cook himſelf, and publiſhed in 2 vols. 4to. in 1777, and the third publiſhed in 3 vols. 4to. in 1784; the two firſt being written by captain Cook, and the third by captain King. To the firſt of theſe volumes is prefixed an introduction by Dr. Douglas, the late biſhop of Saliſbury, containing a brief hiſtorical account of voyages that had been previouſly performed with a view to the objects comprehended by thoſe of captain Cook, a conciſe ſtatement of his diſcoveries, and a detail of the advantages reſulting from them. See alſo Kippis's Life of Captain Cook, and Biog. Brit. vol. iv.

Cook, *Captain* **Henry**, a choir-man, brought up in the chapel-royal during the reign of Charles I., which he quitted at the commencement of the grand rebellion, and went into the king's army, where he conſiderably diſtinguiſhed himſelf; and in 1642, obtained a captain's commiſſion. At the reſtoration, he was appointed maſter of the children of the chapel-royal. He compoſed the coronation anthem, according to Ant. Wood, for Charles II., and a hymn in four parts, compoſed by him, is likewiſe ſaid to have been performed inſtead of the litany, in the chapel of St. George at Windſor, by order of the ſovereign and knights of the garter, on the 17th of April 1661. None of his church muſic, however, was printed, nor has Dr. Tudway inſerted any of his compoſitions in the voluminous MS. Harleian collection of Engliſh ſervices and anthems. And, indeed, if we may judge of them by the few ſecular compoſitions which appear in the collections of the times, he was little fitted for the high office to which he was appointed at the reſtoration. In the ſecond part of Playford's "Muſical Companion," 1667, there are two or three of his ſongs which are dry, ill accented, and equally deſtitute of melody and maſterly harmony. However, he had the merit, or at leaſt the good fortune, to be the maſter of three boys among the children of the chapel, who gave very early teſtimony of their genius and progreſs in compoſition. Theſe were Pelham Humphrey, John Blow, and Michael Wiſe, who, even while they were choriſters in the chapel, produced verſe anthems, far ſuperior in melody and deſign to any that our church could boaſt, anterior to Purcell. Cook died in 1672, according to Ant. Wood, of grief, at being ſo far ſurpaſſed in compoſition by his young pupil, Pelham Humphrey.

Cook, *Dr.* **Benjamin**, an eminent organiſt and contrapuntiſt, in the ſtyle of our beſt eccleſiaſtical compoſers, whom he had ſtudied from Tallis, to Crofts, Weldon, and Green: a very correct harmoniſt and good organ player, but with limited powers of invention. He was organiſt of Weſtminſter Abbey, and on the death of Kelway elected organiſt of St. Martin's in the Fields. He long preſided at the Crown and Anchor concert, which was originally eſtabliſhed for the preſervation of the beſt works of the moſt eminent maſters of old times. It is a curious circumſtance, that at this concert of ancient muſic, Handel was regarded as an innovator, and Geminiani thought it an honour to be allowed to dedicate his laſt concertos to this ſociety. Dr. Pepuſch, who eſtabliſhed and directed this concert, to the time of his death, never allowed Handel any other merit than that of a good practical muſician. The irreconcileable enmity between the lovers of old and new muſic, became from the time of this inſtitution, as violent as the rage between the champions of ancient and modern learning. Dr. Cook, a ſteady votary of the old maſters, died September 1793. He was the ſon of Benjamin Cook, who kept a muſic ſhop in New-ſtreet, Covent Garden, and who publiſhed by patent, among other things, ſix concertos for violins, tenor and baſs, by Alexander Scarlatti; the chamber ſymphonies of Porpora, for three inſtruments; and the two books of leſſons by Domenico Scarlatti, in long 4to., of which Roſingrave was the editor. After the deceaſe of Cook, Johnſon reprinted Scarlatti's leſſons, with the ſame title page, and the ſame errors, as had eſcaped correction in the former edition.

Cook, Henry, a native of this country, born in 1642. Having a taſte for hiſtorical painting, he travelled to Italy for the purpoſe of improving himſelf in this branch of the art, and ſtudied under Salvator Roſa; but, on his return to England, met with ſo little encouragement, that for many years he remained in want and obſcurity. At length, however, his talents gained him notice, and he was employed by king William to repair his cartoons; he likewiſe finiſhed the equeſtrian portrait of Charles II. at Chelſea-college, painted the choir of New-college chapel Oxford, and the ſtaircaſe at Ranelagh houſe, beſides many other works mentioned by Mr. Walpole. He is alſo ſaid to have tried portrait painting, but to have given it up, diſguſted with the caprices of thoſe who ſat to him. He died 18th Nov. 1700. Walpole's Anecdotes.

Cook, in *Ichthyology*, a ſpecies of fiſh, which is ſometimes taken in great plenty on the coaſt of Cornwall. It is a ſcaly fiſh, and does not grow to any great ſize: the back is purple, the belly yellow, and the tail rounded.

Cook's *River*, in *Geography*, a river of North America, which runs into the northern Pacific ocean, between Cape Elizabeth and Point Banks, *i. e.* between E. long. 207° 9′, and 207° 45′; N. lat. 58° 42′, and 59° 10′; and which, by its various branches, opens a very conſiderable inland navigation. This name was given to the river by lord Sandwich, in honour of captain Cook, who, in the year 1778, traced it as high as the latitude of 61° 30′, and the longitude of 210°, or about 70 leagues from its entrance, without perceiving the leaſt appearance of its ſource. "It was a ſatisfaction to me," ſays this perſevering navigator, (Third Voyage, vol. ii. p. 397.) "to reflect, that, if I had not examined this very conſiderable inlet, it would have been aſſumed, by ſpeculative fabricators of geography, as a fact, that it communicated with the ſea to the north, or with Baffin's or Hudſon's bay to the eaſt; and been marked, perhaps, on future maps of the world, with greater preciſion, and more certain ſigns of reality than the inviſible, becauſe imaginary, ſtraits of de Fuca, and de Fonte." Mr. King was ordered to land on the northern point of the low land, on the S.E. ſide of the river, there to diſplay the flag, to take poſſeſſion of the country and river in the name of his Britiſh majeſty, and to bury in the ground a bottle, containing ſome pieces of Engliſh coin, of the year 1772, and a paper, on which were inſcribed the names of the ſhips and the date of the diſcovery. Near the ſhore Mr. King obſerved about twenty of the natives, who appeared with their arms extended, probably to expreſs their peaceable diſpoſition, and to ſhew that they were without weapons. When their alarm, occaſioned by the ſight of muſquets, had ſubſided, they allowed their new viſitants to approach them, and appeared to be cheerful and ſociable. Their ſpears and their other hoſtile weapons, as it was afterwards diſcovered, were hid in the buſhes cloſe behind them. The ground was ſwampy, and the ſoil poor, light, and black. It produced a few trees and ſhrubs, ſuch as pines, alders, birch, and willows; roſe and currant buſhes, and a little graſs, but not ſo much as a ſingle plant or flower was diſcovered. On a future day, ſeveral large and ſome ſmall canoes, with natives, came off to the Britiſh ſhips, and bartered their ſwine; after which, they ſold their garments, till many of them were quite naked. Among others, they brought a number of white hare or rabbit ſkins, and very beautiful reddiſh ones of foxes; but there were only two or three ſkins of otters. They alſo ſold pieces of ſalmon and halibut. They preferred iron to every thing elſe offered to them in exchange. The lip-ornaments did not ſeem ſo frequent among them as at Prince William's Sound; but they had more of thoſe which paſs through the noſe, and, in general, theſe were alſo much larger. They had, however, a greater quantity of a kind of white and red embroidered work on ſome parts of their garments, and on other things, ſuch as their quivers and knife-caſes. On the weſt ſide, a volcano was diſcovered, in lat 60° 23′; and this is the firſt high mountain N. of mount St. Auguſtine. The volcano is on that ſide of it next the river, and not far from the ſummit. It only emitted a white ſmoke without fire. Captain Cook obſerves, that all the people met with near this river, ſeemed, by every ſtriking token of reſemblance, to be of the ſame nation with thoſe who inhabit Prince William's Sound, but eſſentially differing from thoſe of Nootka, or King George's Sound, both in their perſons and language. The language of theſe is rather more guttural; but, like the others, they ſpeak ſtrongly and diſtinctly in words which ſeem to be ſentences. Theſe people are in poſſeſſion of iron; that is, the points of their ſpears and their knives are of this metal, and ſome of the former are alſo made of copper. Their ſpears are like our ſpontoons; and their knives, which they keep in ſheaths, are of a conſiderable length. Theſe, with a few glaſs beads, were the only things ſeen among them that were not of their own manufacture.

Their beads and iron they muſt have received from ſome civilized nation; and it ſeems moſt probable, that they procured them through the intervention of the more inland tribes from Hudſon's Bay, or the ſettlements on the Canadian lakes; unleſs it can be ſuppoſed (which, however, is leſs likely) that the Ruſſian traders from Kamtſchatka, have already extended their traffic ſo far; or at leaſt that the natives of their moſt eaſterly Fox iſlands, communicate along the coaſt, with thoſe of *Prince William's Sound*; which ſee. The Ruſſians themſelves, ſays captain Cook, have never been among them; for if that had been the caſe, we ſhould hardly have found them clothed in ſuch valuable ſkins as thoſe of the ſea-otter. There is not the leaſt doubt, continues captain Cook, that a very beneficial fur trade might be carried on with the inhabitants of this vaſt coaſt. But unleſs a northern paſſage ſhould be found practicable, it ſeems rather too remote for Great Britain to receive any emolument from it. It muſt, however, be obſerved, that the moſt valuable, or the only valuable, ſkins which Cook ſaw on the weſt ſide of America, were thoſe of the ſea-otter. All their other ſkins ſeemed to be of an inferior quality, particularly thoſe of their foxes and martins. Moſt of the ſkins that are fitteſt for ſale, are thoſe which are made up for outer garments, and this is the chief uſe for which they kill the animals. By increaſing intercourſe with purchaſers, they would be more aſſiduous in procuring ſkins, and thus a plentiful ſupply might be obtained in this country.

In Cook's river, the tide is very conſiderable, and much contributes to facilitate the navigation of it. It is high water in the ſtream, on the days of the new and full moon, between two and three o'clock; and the tide riſes perpendicularly, between three and four fathoms. The reaſon of the tides being greater here than at other parts of this coaſt, is, that, the mouth of the river being ſituated in a corner of the coaſt, the flood from the ocean is forced into it by both ſhores, and thus ſwells the tide to a great height. The variation of the compaſs was 25° 40′ E.

Cook-*room*, in a *Ship*, is where the cook and his mate dreſs and deliver out the meat, &c.

Cook's *Strait*, in *Geography*, ſo called from its diſcoverer captain Cook, a ſtrait which ſeparates the two iſlands that form New Zealand. This ſtrait is about four or five leagues broad; and the iſlands, thus divided, are ſituated between the latitudes of 34° and 48° S.; and between the longitudes of 181° and 194° W. See New Zealand.

COOKE, *Sir* Anthony, in *Biography*, governor, preceptor, or ſchoolmaſter, to king Edward VI., and great grandſon to ſir Thomas Cooke, lord-mayor of London in 1462, was born at Giddy-hall in Eſſex about the year 1506, and educated, probably, at Cambridge. He became eminent in literature and the arts, being a thorough maſter of the Latin and Greek languages, an excellent critic and philologiſt, and equally ſkilled in poetry, hiſtory, and the mathematics. He was no leſs diſtinguiſhed for his piety and goodneſs. Theſe qualities recommended him to the office of inſtructor to king Edward VI., and the royal pupil is well known to have done honour to the talents and character of his preceptor. During queen Mary's reign he was an exile for religion; but upon the acceſſion of queen Elizabeth he returned to his native country, fixing his reſidence at Giddy-hall, the building of which he completed. He died June 11, 1576, having attained the age of 70 years, and was buried in the chapel of Rumford in Eſſex, where a monument was erected to his memory. He left four daughters, eminently learned in the Greek and Latin languages; *viz.* Mildred, married to ſir William Cecil, baron Burleigh, lord-treaſurer of England; Anne, wife of ſir Nicholas Bacon, lord keeper of the great ſeal; Elizabeth, married to John, lord Ruſſel, ſon and heir of Francis earl of Bedford; and Catherine, wife of Henry Killigrew, eſq. He had alſo two ſons.

COOKERY *of Meats*, in *Domeſtic Economy*, denotes the application of heat to the ſeveral aliments taken both from vegetables and animals. The advantages attending the application of heat to vegetable aliments are ſuch as follow: 1. That the greateſt part of vegetable ſubſtances are thus rendered more ſoluble in the human ſtomach. The only doubt, ſays Dr. Cullen, that can ariſe with regard to this, reſpects vegetables to which in their crude ſtate a boiling heat is immediately applied, ſo that in many of them a coagulation is produced; in conſequence of which they ſeem to be rendered leſs ſoluble in water than they were before:—but this, he ſays, does not ſeem to have any effect on their ſolution in the ſtomach. Whether the difficult ſolution be obviated by ſome degree of fermentation that neceſſarily takes place in the ſtomach, or by the powers of the gaſtric fluid, it is not neceſſary to determine, as it is certain that the action of heat ſeparates in ſome meaſure the ſmall particles of bodies, and thereby renders them more readily ſeparable by the ſolvent powers of the ſtomach. 2. The application of heat ſeparates and diſſipates the volatile parts of vegetable ſubſtances, which are ſeldom of a nutritious nature, and, in many caſes, have a tendency to prove noxious. 3. The application of heat to a certain degree extricates and diſſipates a conſiderable quantity of air, which, in the natural ſtate of vegetables, is always fixed in their ſubſtance; and it is probably, in this way eſpecially, that heat beſt contributes to the dividing and looſening of the coheſion of the ſmall parts of vegetable ſubſtances. It is certainly in this way, by diſſipating a large portion of their air, that vegetables are rendered leſs liable to fermentation, and leſs liable to produce that flatulence, which is occaſionally ſo troubleſome in the ſtomach and inteſtines. Dr. Cullen obſerves further, that, as the heat may be employed in two ways, either in a humid or a dry form; the former is always better ſuited than the latter to all the purpoſes above-mentioned. The cookery of animal ſubſtances alſo conſiſts chiefly in the application of heat. Other practices, however, previous to cookery, may be conſidered as parts of it; particularly ſalting, drying, and pickling. Theſe practices, however, are merely uſeful for the purpoſes of domeſtic economy, as preſerving meat from putrefaction, before it be ſubjected to heat, for a longer time than it could be preſerved without ſuch means. Theſe practices, Dr. Cullen thinks, can never increaſe the nutritious quality of meat, or render it even of more eaſy digeſtion. Drying certainly brings the ſolid parts of meat more cloſely together, which muſt render it of more difficult ſolution. The addition of ſalt, which ſtimulates the ſtomach, may ſeem in ſome caſes to promote digeſtion; but this muſt be when the ſalt is added in ſmall quantity, and when the meats preſerved by it are taken in moderate quantity only. For when meats have been long ſalted they are hardened, and rendered in proportion leſs ſoluble in the ſtomach: and a large quantity of ſalt accompanying them is certainly hurtful to the ſyſtem. There is one preparation of animal food, which is made without any addition; and that is by its being kept for ſome time before it is ſubjected to cookery, for a longer or ſhorter interval, according to the ſeaſons, and the nature of the meat; but always till it has made ſome advance towards putrefaction. The tendency to this ſeems to take place from the moment that life is extinguiſhed in the animal; and the allowing of it to take place to a certain degree renders the meat more eaſy of ſolution in the ſtomach; and if the putreſcency be only in a moderate degree, it does not ſeem to injure the nutritious quality of the meat. The proper degree of putreſcence is not eaſily aſcertained; and it is certainly different according to the conſtitution of the perſon. Some can uſe meats tainted in a conſiderable degree without inconvenience: whilſt the digeſtion of others is much diſturbed by the ſmalleſt quantity of putreſcent meat. Every advance in meats towards putreſcency, renders them, as Dr. Cullen ſays, more ready to increaſe the tendency of the animal fluids to that ſtate which we take to be always hurtful to the human conſtitution, as it both favours the acceſs of diſeaſes, and aggravates their ſymptoms and danger when they occur.

The cookery of animal ſubſtances by the application of heat is of two kinds, as it is applied in a humid form by *boiling* and *ſtewing*, or in a dry form, by *roaſting*, *broiling*, and *baking*. For the proceſſes and effects of boiling and ſtewing; ſee Boiling. The application of heat in a dry form is of two kinds, as it is in cloſe veſſels, or as it is expoſed to the free air. The firſt is *baking*; and though commonly in this practice the cover of the meat is merely paſte, any conſiderable exhalation is prevented, and the retention of the juices under the application of heat renders the meat more tender; and in all caſes when the heat applied looſens, and, in ſome meaſure, extricates the air, without exhaling it, the ſubſtance is rendered more tender than when with any other application an exhalation is allowed. In *broiling* an exhalation takes place; but as the heat of a naked fire is more nearly applied, the outer ſurface is in a degree hardened before the heat penetrates the whole, and thus a great exhalation is prevented, while the whole is rendered ſufficiently tender; but this kind of cookery is eſpecially ſuited to meats that are choſen to be eaten a little raw. *Frying* is a-kin to this; but as in this caſe the meat is cut into thin ſlices, and laid in a veſſel which is interpoſed between the meat and the naked fire, the heat is more equally applied to the whole ſubſtance. But as the part of the meat lying next to the bottom of the veſſel would be ſuddenly hardened by the heat, it is always neceſſary to interpoſe ſome fluid matter. When this, as is moſt commonly the caſe, is of an oily matter, a ſtrong heat is apt to render it empyreumatic, or at leaſt leſs miſcible with the fluids of the ſtomach; and, therefore, all fried meats are leſs eaſily digeſted than thoſe of any other preparation, except that ſometimes the ſame may happen to baked meats, to which an oily matter, and that only, is added to avoid the too drying heat. By *roaſting* the heat may be ſo managed as to be equally applied, and therefore its effect in rendering the meat more tender is certainly obtained; and though a conſiderable exhalation is made, it is almoſt only of a watery humidity. This, indeed, would take place to a very great degree, and render the meat again more inſoluble, were it not that large maſſes only are ſubjected to this operation, and that thereby the outer ſurface is firſt condenſed, and prevents the exhalation from the interior parts. At the ſame time, an oily matter is commonly and repeatedly applied to the outer ſurface, which prevents both much exhalation, and any great hardening of the outer ſurface, till the heat has penetrated the whole, and rendered it ſufficiently tender. Cullen's Mat. Med. vol. i. pt. i. c. 2.

COOK-HOUSE, in *Geography*, a town of America, ſituated on the Cooquago branch of Delaware river, in the townſhip of Colcheſter, New-York, 18 miles S. of the mouth of Unadilla river.

COOKIA, in *Botany*, (named by Sonnerat, in honour of our illuſtrious circumnavigator, captain Cook.) Willd. 844. Juſſ. 261. Vent. 3. 155. Sonnerat It. 2. 181. tab. 80. Retz. Obſ. 62. Jacq. Hort. Schoenb. 1. 53. tab. 101. (Quinaria Lanſium; Lour. —. Wampi of the Chineſe.)

Gen. Ch. *Cal.* very ſmall, five-cleft. *Cor.* Petals five, ſpreading. *Stam.* Filaments ten, diſtinct; anthers roundiſh. *Piſt.* Germ ſomewhat pedicelled, hirſute; ſtyle one; ſtigma capitate. *Peric.* Berry; Juſſ. (Pome; Willd.) five-celled; three frequently abortive. *Seeds* one in each cell.

Eſſ. Ch. Calyx five-cleft, inferior. Petals five, equal, inferior. Berry or pome, five-celled. Seeds one in each cell.

Sp. Cookia *punctata*. A tree. *Trunk* browniſh, ſtriated, rugged. *Branches*, petioles and common peduncles rough, with prominent points. *Leaves* alternate, petioled, unequally pinnated; leaflets petioled, alternate, egg-ſhaped, acuminate, quite entire, ſmooth, ſprinkled with pellucid dots, inner ſide narrower. *Flowers* white, in a large divaricated terminal panicle. A native of China and of the South Sea iſlands.

COOLER, among *Brewers*, *Diſtillers*, &c. a large veſſel, uſually of ſmall depth and large ſurface, in which liquors are cooled, after having been boiled.

COOLIES, in the Eaſt Indies, are thoſe natives who are employed in carrying of burthens, digging of trenches, and ſuch laborious occupations; and who, ſupplying the place of pioneers, cannot be diſpenſed with in the operations of military tactics in Hindooſtan.

COOLING is the progreſſive decreaſe of temperature from a higher to a lower degree. From the higheſt degree of heat, which human induſtry has been able to obtain by means of combuſtion, or by concentrating the ſolar rays, to the loweſt degree of it, which both natural and artificial methods have produced, the ſcale is very conſiderable; and different parts of it have obtained diverſe denominations, which are derived from the moſt ſtriking phenomena that take place at particular points of the ſcale; thus we hear of porcelain heat, white heat, red heat, boiling heat, temperate, freezing, &c. and all theſe tranſitions from the firſt to the laſt, fall under the denomination of *cooling*; whereas the contrary tranſition from the loweſt to the higheſt, is called *heating*. In order to preſerve perſpicuity, and to aſſign to each of the received denominations, the particulars which belong more immediately to it, we have divided the ſubject into three articles, under the words *congelation*, *cooling*, and *freezing*. Under the firſt we have ſtated the phenomena of natural congelation; the laſt contains whatever relates to artificial freezing, *viz.* to the production of cold below 32° of Fahrenheit's ſcale; and under the preſent, we ſhall principally ſtate all the methods and the effects of cooling from the actual temperature of the atmoſphere to a lower degree; but not below that of melting ice, *viz.* 32°, which is commonly called the freezing point.

The temperature of the atmoſphere in the hotteſt climates, has hardly ever been known to exceed 130°, and it is but ſeldom that it reaches that moſt oppreſſive degree of heat. In the human ſpecies, nature has made ample proviſion, and has furniſhed them with induſtry ſufficient for counteracting the effects of a very high or a very low temperature; but without any artificial aſſiſtance, few are the degrees of heat in which human beings can live with perfect comfort. Making ſome allowance for the natives of different climates, the whole range temperature may be ſaid to reach from the 60th to the 70th degree of Fahrenheit's ſcale. Below 60° moſt perſons have no objection to a gentle fire in their apartments; and above 70° they generally complain of heat. Yet when the natural temperature of the atmoſphere is above 50°, cooled liquors are generally preferred for drink; but when the temperature is above 70°; then not only cooled liquors, but cool apartments alſo, are articles of great luxury; and (it may in great meaſure be ſaid) of neceſſity. The languor which is commonly induced by heat, is in great meaſure relieved by artificial cooling. Patients affected with fevers of the intermittent and putrid kinds, which are ſo very common and deſtructive in hot climates, receive great benefit from the uſe of cooled liquors, and ſuch are plentifully adminiſtered to them, whenever they can be obtained. The preſervation likewiſe, of meats, fruit, butter, &c. in warm climates, or in the hot ſeaſon, is conſiderably aſſiſted by cooling; and it may be extended to a very remarkable long period by actual freezing.

In order to anſwer all theſe purpoſes, mankind has, from time immemorial, endeavoured to diſcover and to apply methods

thods of cooling, or of refrigeration. Theſe methods, as far as they are at preſent known, may be compriſed under the following heads; *viz.* 1ſt, the application of ſomething naturally colder than the actual temperature of the atmoſphere; 2dly, ventilation; 3dly, evaporation; and 4thly, the ſolution of certain ſaline ſubſtances. Sometimes two or three of theſe means are applied at the ſame time, to the article which is required to be cooled. In every country of Europe, and eſpecially in the ſouthern part of it, ice is collected during the winter, in proper places, and is uſed for cooling liquors, &c. in the ſummer ſeaſon, or throughout the whole year. And this undoubtedly is the moſt eaſy, the moſt extenſive, and the moſt effectual method of cooling. A little ice taken out of the ice-houſe, and placed round a bottle of water or wine, in any convenient veſſel, ſoon cools it to the deſired degree; and if the effect is to be increaſed, ſo as to freeze creams, fruit, &c. by breaking the ice into ſmall pieces, and mixing common ſalt with it, the deſired end will be obtained. The ice-houſe itſelf is of very eſſential uſe for preſerving meat, fiſh, butter, fruit, &c. which things need only be laid in it, until they are wanted.

When ice cannot be eaſily procured, well water forms a uſeful ſubſtitute to a certain degree. When the depth of the well is 40 or 50 feet, or upwards, the conſtant temperature of its water is very nearly equal to the mean temperature of the country, which, of courſe, is lower than the uſual temperature of the ſummer ſeaſon in that country; hence, if a pail of water be drawn, and a bottle of wine, or other liquor, be immediately placed in it; a conſiderable refrigeration may be obtained, and it may be maintained by drawing freſh water at intervals from the well, &c. Thus in London the mean temperature is about 50°, and ſo is the temperature of pretty deep wells throughout the year. Now in the ſummer ſeaſon, the temperature frequently riſes above 65°, or 70°; therefore, at thoſe times, by applying freſh-drawn well-water, the liquors we drink may be cooled about 15 or 20 degrees, which will render them incomparably more pleaſant. When articles of food are required to be kept ſome time longer than the heat of the weather would allow, they may be placed in a baſket at the end of a rope, and may be let down into the well, until they come within a foot or two of the water. For the like purpoſes, pretty deep pits, caves, or grottos may be uſed; ſince their temperature is nearly equal to the mean temperature of the country, and ſuffers little or no variation between winter and ſummer.

Ventilation is nothing more than a conſtant change of air; but if the air which has juſt paſſed by a body, and that which ſucceeds it are all of the ſame temperature, no cooling will be produced by the ventilation; but the refrigeration will take place, when the body is hotter than the air which paſſes by it, or when an increaſe of evaporation enſues. Expoſe a thermometer to the open air, but ſhelter it from the wind, and when the thermometer is become ſtationary, let the wind fall upon it; and it will be found that the quickſilver is not lowered in it. But when a human being, or other animal is expoſed to ventilation, the quick tranſition of air cools it; firſt, becauſe it continually removes the air which has been heated by the contact of the animal body, the breath, &c.; and ſecondly, becauſe the evaporation from the body is increaſed by the ventilation. So that, upon the whole, the uſe of ventilation, ſuch as is effected by means of fans, bellows, a particular diſpoſition of apartments, and other machines, is to remove heated or vitiated air from the vicinity of human beings, from cloſe habitations, priſons, ſhips, &c. The ingenious Dr. Hales fixed a machine of this ſort in the old Newgate priſon, which, being put in action by means of ſails, like a wind-mill, conſtantly ventilated the inſide of that priſon; and this machine remained in uſe until the rebuilding of that priſon upon a better plan rendered it ſuperfluous. See VENTILATOR.

Hitherto we have ſuppoſed, that the air is colder than the human beings who are expoſed to it; but ſhould the contrary be the caſe, then ventilation will produce a different effect; *viz.* it will heat, inſtead of cooling, as may be eaſily conceived by conſidering what has been ſaid above. And ſuch is the caſe with the hot winds, which ſometimes blow in Arabia, Africa, India, and other places.

One of the moſt uſeful and efficacious modes of cooling, eſpecially in thoſe countries where it may be moſtly wanted, is performed by means of evaporation. The principle upon which the cooling power of evaporation depends, is, that whenever a body is expanded, *viz.* its volume is increaſed, its capacity for containing heat is increaſed at the ſame time; hence the expanding body abſorbs the heat of the ſurrounding bodies, which, of courſe, are cooled by it.—A ſhort experimental illuſtration of this theory will eaſily explain the effect we are treating of. Take three common mercurial thermometers: keep one in its natural ſtate; place the ſecond in a bottle of water, and cloſe its aperture; wrap ſome cotton moiſtened with water round the bulb of the third; then expoſe all the three thermometers thus prepared to the ambient air, eſpecially when the wind blows in the ſummer ſeaſon; and after a few minutes obſerve their progreſs. It will be found that the naked thermometer, and that which ſtands in the bottle, indicate the ſame degree of temperature; but the third thermometer, which is wrapped in moiſtened cotton, will be found to indicate a temperature lower by a few degrees, than the former. The effect in this experiment is produced by the evaporation of the water from the cotton, and not from the water as water; for if that were the caſe, the thermometer in the bottle of water would likewiſe be cooled like the one involved in moiſtened cotton. Evaporation is the converſion of water into ſteam, or vapour; and the bulk of ſteam has been found to be many hundred times larger than the bulk of the water from which it originated. Now in that expanded ſtate, ſteam is capable of holding a vaſt deal more of the element of heat, than in its form of water, and that without manifeſting any higher degree of temperature. Or, in other words, if a thermometer be placed in a bottle full of vapour of water, and another thermometer be placed in the water from which that vapour was juſt produced, their temperatures will be found to be nearly the ſame; yet the vapour contains a vaſt deal more of the element of heat than an equal weight of water, which quantity of heat is eſſentially neceſſary for maintaining its elaſtic or vapourous exiſtence; and this is proved by obſerving, that vapour cannot be converted into water without depoſiting its heat upon (and of courſe elevating the temperature of) the ſurrounding bodies; and on the other hand, that water cannot be converted into vapour, without abſorbing heat from (and conſequently cooling) the ſurrounding bodies. Mr. Watt of Birmingham ſays, that he has obſerved as exact a coincidence between the heat rendered latent in the vapour, and that which emerges from it, as can be deſired; and that the heat obtainable from ſteam, capable of ſuſtaining the ordinary preſſure of the atmoſphere, is not leſs than 900°; and that it does not exceed 950° of Fahrenheit's ſcale.

The cooling action of evaporation is counteracted by the influx of heat from the ſurrounding bodies, ſince heat always tends to equalize the temperature of contiguous bodies. Thus in the above deſcribed experiment, the heat of the ſurrounding air tends to elevate the temperature of the thermometer, at the ſame time that the evaporation from the cotton tends to lower it. And according as the one or the other of theſe oppoſite actions predominates, ſo the cooling effect is more or leſs conſpicuous. From theſe obſervations it naturally follows, that the cooling, occaſioned by evaporation, is greater when the evaporation is quicker, and contrarywiſe; alſo, that when different fluids are uſed for the evaporation, in ſimilar circumſtances, that fluid which evaporates quickeſt, produces the greateſt refrigeration. Mr. Cavallo ſays, "in order to try the degree of refrigeration produced by the evaporation of different fluids, I held up a naked thermometer, (*viz.* a thermometer, the bulb of which was not in contact with the metal of the ſcale) and poured upon its bulb a ſtream of ſome particular fluid, which iſſued out of the capillary aperture of a tube; taking care to throw juſt fluid enough to ſupply the waſte by evaporation. By this means, when the temperature of the air was 64°, I found that the evaporation of water cooled the thermometer 8°; *viz.* brought it down to 56°; the evaporation of ſpirit of wine cooled it 16°; *viz.* brought it down to 48°; and the evaporation of ether cooled it 54°; *viz.* brought it down to 10°. But, by the uſe of the beſt purified ſulphuric ether, when the temperature of the air was about 56°, I brought the thermometer down to 3°. The cooling produced by the evaporation of other fluids needs not be mentioned; their effect being generally intermediate between the effect of water, and that of ſpirit of wine." (Phil. Tranſ. vol. lxxi.) Whatever promotes the evaporation, ſuch as a dry air, and eſpecially a dry wind, tends to increaſe the refrigeration; and when all the favourable circumſtances concur, the effect is prodigious; ſo that in a dry, warm, and briſk wind, by means of the evaporation of the beſt ſulphuric ether, the temperature of any kind of bodies may be lowered many degrees below the freezing point; and animals might be eaſily frozen to death.

Though ſeveral of the above-mentioned particulars, and eſpecially the cauſes upon which they depend, have been but lately inveſtigated and aſcertained; yet the cooling effect of evaporation has been known and uſed by mankind from time immemorial. Athenæus ſays, as being related by Protagorides of Cyzicum, that in the time of king Antiochus, it was uſual to cool water by evaporation, and to drink it as a luxury. A very eaſy and familiar experiment to ſhew the effect of evaporation, may be performed in the following manner. Moiſten a ſmall ſpace on the upper part of each hand; cover one of thoſe places with an inverted wine glaſs, and let a perſon blow with a pair of bellows upon the other hand. The latter will be ſenſibly cooled, but not the former. Change the glaſs and the blowing, from one hand to the other, and the effects will be reverſed. Seamen, eſpecially in the night time, frequently employ this natural effect for diſcovering which way the wind blows. They moiſten a finger of their hands by putting it in their mouth; then expoſe it to the ambient air by elevating it above their head; and juſtly conclude that the wind blows from that quarter which is oppoſed to the moſt cooled ſide of the finger.

In warm climates, where the dryneſs of the air generally is very great, the refrigeration ariſing from evaporation is very conſiderable, and is of courſe frequently employed for counteracting the natural heat. The caravans which traverſe the parched deſerts of Arabia, are obliged to carry their ſupply of water in earthen jars upon camels; but in order to keep it pleaſantly cool, the jars are involved in cloths, which they take care to keep continually moiſtened with water. It is a pretty common practice in the ſouthern parts of Europe, as well as in the Eaſt and Weſt Indies, in America, &c. to wrap up a bottle of wine, or water, or other liquor, in a wet cloth, and thus to ſuſpend it in a ſhady place, either under a tree or in a paſſage, ſo as to expoſe it to the briſkeſt current of air that can be obtained; for by this means the liquor will be cooled ſeveral degrees; care, however, muſt be had to ſprinkle more water upon the cloth, which ſurrounds the bottle, in proportion as the former evaporates. Mr. Walker, of Oxford, deſcribes a peculiar method of producing a very conſiderable degree of cold by means of evaporation. "Having," he ſays, "in the courſe of the preceding winter, frequently ſucceeded in producing ice, by the cold produced from evaporation with water, when the temperature of the air was 38°; it occurred to me, that it might be poſſible to freeze water in the middle of ſummer, by a proceſs which depended on this principle, by the uſe of water only. Accordingly, I procured a tall cylindrical veſſel, holding about two gallons, in which is fixed a ſmall ſpiral tube, as in the worm-tub of a common ſtill; the lower end of this tube comes out through the veſſel near the bottom, ſufficient to connect the noſle of a pair of bellows to it, by the intervention of a bladder, ſecured air-tight; this ſpiral tube ends at the top of the cylindrical veſſel, where it is ſomewhat enlarged, like the mouth of a funnel. This veſſel, being covered with flannel, was filled with water and hung out in a briſk dry wind, the temperature of the air being 50°; after ſome time, by repeatedly wetting the flannel on the outſide of the veſſel, I found the water within was cooled to 40°; air being then forced through the tube (by means of the bellows), ſurrounded by the cooled water, came out at the upper extremity of the tube at nearly the ſame temperature.

"A thermometer having its bulb covered with lint, and wetted repeatedly with the cold water in the veſſel, placed ſo as to receive the draught of cold air from the tube, ſoon ſunk to 34°; hence by a ſeries of two or three of theſe veſſels, water might, upon this principle, be frozen at midſummer, recollecting that this experiment may always commence at 50°, the uſual temperature of ſprings; and hence it might be poſſible upon the ſame principle, to cauſe nature upon a ſmall ſcale, even without the immediate interpoſition of art, to depart from her uſual courſe, and to aſſume the hoary garb of winter at midſummer.

"For this purpoſe a current from the external air might be admitted into the tube, by means of a funnel, communicating with, and receiving, a conſtant draught of air.

"In an attempt of this kind, it would be neceſſary (beſides ſome other variation in the veſſels, which circumſtances might point out,) that the cylindrical veſſels be porous, or pierced with ſmall holes; ſo that the water may be conſtantly and gently oozing out."

In Spain, in Italy, in Egypt, and probably in other places, certain veſſels are made of a porous earth, which, when full of water, will juſt permit ſome of that fluid to ooze out on their external ſurface, whence it evaporates, and thus cools the remainder of the liquor within the veſſel. The Spaniſh veſſels for this purpoſe conſiſt of a reddiſh brown earth. They are pretty broad, but not very capacious. In Italy they have been made of a pale yellowiſh material, but much larger. In Egypt they are made ſomewhat in the ſhape of a Florence flaſk, and not much bigger; but their aperture ſpreads out in the form of a cone, or rather of an ale glaſs, which is done for the conveniency of drinking out of it. Their ſubſtance is of the colour of aſhes, and it is ſaid to be a ſcum left on the banks of rivers. But veſſels of any degree of poroſity may be made by mixing ſand and clay in various proportions.

The uſe of theſe veſſels in Spain, in Italy, and eſpecially in Egypt, is attended with a notable degree of refrigeration, on account of the great dryneſs of the air in thoſe climates, which enables it to abſorb a great deal of moiſture in a ſhort time; but the ſame veſſels having been brought over, and having been tried, in this country, have been found to cool the contained liquor in a very trifling degree; evidently owing to the ſtate of the air in this country, which is much leſs hot, and much leſs dry than in the above-mentioned places; therefore much leſs apt to promote evaporation. One of the Egyptian veſſels was tried in London at a time when the temperature of the atmoſphere was at a mean, and after about half an hour, when almoſt three quarters of the water had paſſed through it, and had dropped down, the remaining quantity of water was found barely 3° colder than the ſurrounding air.

It is but lately that liquor coolers have been manufactured in this country, and they are at preſent to be found in moſt of the earthenware ſhops in and about London. Theſe are cylindrical veſſels, about ſix inches in diameter, and about a foot high. It is directed to keep one of theſe veſſels entirely immerged in water during one hour. The veſſel, being then removed, in that moiſt ſtate, without putting any water in it, a bottle of wine, &c. muſt be placed in it, and this is ſaid to be cooled by the evaporation of that quantity of water, which the ſubſtance of the veſſel had imbibed whilſt it remained under water. Upon trial, however, it appears that the actual refrigeration which is obtained by means of one of theſe veſſels, ſeldom amounts to two or three degrees; and that, of courſe, a bottle of wine may be cooled much more effectually by placing it into a pail of water freſh drawn from a pretty deep well or pump; which may be renewed at intervals. Indeed, conſidering the form of theſe coolers, alſo that the ſides of it are at a conſiderable diſtance from the ſurface of the bottle, and the ambient air has a free acceſs to both, it is hardly to be expected that any ſenſible advantage ſhould be obtained from them.

In India the action of evaporation is uſed not only for cooling liquors, but likewiſe for cooling apartments, and the effect, by the teſtimony of thoſe perſons who have experienced it, is ſaid to be very remarkable. The method, (which, however, is practicable only when a dry wind blows,) is as follows. That door of the apartment which is oppoſed to the wind, and through which the wind enters, is ſtopped up with a peculiar ſort of ſcreen or curtain, which fits it exactly. This ſcreen conſiſts of two ſurfaces or gratings of bamboo, ſituated parallel to each other, and about three or four inches apart; then the ſpace between theſe external ſurfaces is filled up in a looſe manner with the roots of a ſweet-ſcented graſs. In ſhort the conſtruction of this ſcreen is calculated to admit the air not in a body, but divided through a vaſt number of paſſages. Two men are placed on the outſide, each having a goat's ſkin filled with water, which they keep continually ſprinkling upon the ſcreen. A conſtant and copious evaporation is of courſe kept up, which preſently cools the adjoining room to a very remarkable degree. By this means the temperature of the room has ſometimes been lowered upwards of 15°.

Amongſt thoſe cooling proceſſes which depend upon the expanſion of bodies, that which ariſes from the expanſion of air muſt not be forgotten; but as this is by no means very practicable, we ſhall barely mention it in this place. The condenſation and expanſion of air produce the effects which have been mentioned above; *viz.* the former is attended with an extrication of heat, and the latter with an abſorption of it; hence the contiguous bodies are heated by the former, and are cooled by the latter. When air is ſuddenly condenſed, (ſee Condenser, and Condensation,) the heat which is extricated from it, has been found capable of ſetting fire to light combuſtible bodies; and when the air is rarefied either by means of an air-pump, or by liberating it from a veſſel, in which it has been condenſed; the cold it produces has ſometimes been found to lower the thermometer ſeveral degrees below the freezing point.

The laſt method of cooling which remains to be deſcribed, is obtained by the ſolution of ſalts. That certain ſaline ſubſtances, whilſt diſſolving in water, or in acids, would generate a conſiderable degree of refrigeration, and eſpecially that the ſolution of ſalt ammoniac would lower the thermometer down to the freezing point, has been long known; but, within theſe 15 or 20 years, the ſubject has received wonderful improvements, in conſequence of the experiments inſtituted by various ingenious perſons; and eſpecially from the aſſiduous inveſtigations, and ſucceſsful experiments of Mr. Walker of Oxford, who has examined the cooling powers of a vaſt number of ſaline ſubſtances both ſingle and mixed; and has been able to freeze quickſilver at Oxford in the middle of ſummer, merely by the ſolution of ſalts. His intereſting experiments, and his various freezing mixtures, will be found deſcribed under the article Freezing.

A vaſt number of ſalts and ſaline mixtures may be uſed for cooling liquors; but the moſt advantageous are thoſe which, after ſolution, may be recovered by means of evaporation, ſo as to render them uſeful for a ſecond refrigeration, a third, and ſo forth. Yet the price of moſt of thoſe ſalts in Europe, the trouble of recovering them from the ſolution, and pounding them in order to render them fit for another cooling operation, have not rendered this method common in this part of the world; eſpecially where other eaſier methods are practicable. So that in fact the cooling power of ſaline ſolutions is moſtly uſed for particular experiments by the European philoſophers, eſpecially when a very powerful freezing mixture is required. In India, where nitre is very cheap, and the heat of the climate prompts the inhabitants eagerly to adopt every poſſible method of cooling, the practice of cooling liquors, by means of the ſolution of nitre in water, is very common. For this purpoſe, the wine, the water, or any other liquor, is put into a metallic bottle, generally a pewter one, having a pretty long neck. A tub is partly filled with water, and a quantity of nitre is thrown in it; then the operator holds the bottle by the upper end of its long neck, and gently moves it about the ſaline ſolution, and thus cools the liquor in it to a very conſiderable degree. As ſalts will produce cold only during their ſolution, therefore when the firſt quantity of nitre has been thoroughly diſſolved in the above proceſs, more nitre muſt be added; and when the water is completely ſaturated, ſo as not to be capable of diſſolving more ſalt, then the bottle muſt be removed to another tub with a freſh ſaline mixture. The nitre might afterwards be eaſily recovered merely by expoſing the ſolution, in ſhallow pans, to the hot rays of the ſun in that country; this economical plan, however, does not as yet ſeem to have been adopted.

The ſalts which might be uſed for the purpoſe of cooling liquors in this country, or in long voyages, are nitre and ſalt ammoniac; the other ſaline ſubſtances being either more expenſive or not eaſily recoverable after ſolution. Of the effects of nitre alone in water enough may be derived from the above deſcribed proceſs. Salt ammoniac by itſelf gradually added to a quantity of water, will occaſion a conſiderable refrigeration, ſo that a bottle of wine, &c. placed in the ſolution may be cooled even to 32° of Fahrenheit's ſcale. But a mixture of both ſalts is much more efficacious, and the beſt proportion is five parts of nitre, five of ſalt ammoniac, and 16 of water. During the ſolution, which will continue a conſiderable time, this mixture will cool the thermometer ſeveral degrees below the freezing point; but it muſt not be imagined that a ſmall quantity of the ſame will cool a bottle of wine to an equal degree. The ſolution of a given quantity of the mixture abſorbs a certain quantity of heat, and this quantity abſtracted from the ſmall body of the thermometer, will lower its temperature conſiderably; but the ſame quantity of heat abſtracted from a bottle of wine, will cool it proportionably leſs than the thermometer. In order to cool a bottle of wine from the uſual temperature of ſpring waters (which in London is about 50° or 51°) down to about 32°; a pound of nitre with a pound of ſalt ammoniac, and a proportionate quantity of water, will generally ſuffice. The ſalts for this purpoſe muſt be finely powdered and as dry as poſſible. But when a moderate refrigeration is required; half a pound of each ſalt and about three pints of water will be ſufficient.

Glauber ſalt, (*viz.* ſulphate of ſoda) diſſolved in water, likewiſe produces a very conſiderable refrigeration; but this ſalt will not produce that effect unleſs it be in its cryſtallized ſtate. In that ſtate, however, it is not eaſily preſerved, ſince the mere contact of air will render it powdery and opaque, in which caſe its ſolution will generate heat rather than cold. On this account, therefore, this ſalt is not ſo much to be recommended, as thoſe which have been already mentioned. Nearly the ſame obſervations are applicable to the muriate of lime, the ſolution of which ſaline ſubſtance, when properly conducted, has a very powerful cooling property.

Thus we have deſcribed all the practicable proceſſes of cooling, which, if not in this country, are undoubtedly of great conſequence amongſt the inhabitants of warmer climates. We have, likewiſe, ſtated the moſt neceſſary particulars reſpecting the quantity of materials proportionate to the effect, whence the intelligent reader may be enabled to make proper choice of a proceſs fit for his purpoſe, agreeably to the circumſtances which the nature of the place, the actual temperature of the atmoſphere, and other particulars, may offer.

There are now two other particulars belonging to the preſent article which deſerve to be briefly mentioned. The firſt is that by cooling, certain bodies acquire electrical properties; and the ſecond is that the law of cooling, or progreſs of refrigeration, furniſhes a method of meaſuring ſuch high degrees of heat, as exceed the ſcale of ordinary thermometers.

With reſpect to the firſt, it has been obſerved that ſulphur, in cooling after having been melted, becomes electrified, ſo as to attract and repel ſmall light bodies like any other excited electric. The ſame thing alſo takes place with wax, chocolate, and a few other ſubſtances. Beſides this effect of cooling after fuſion, there are certain ſolids, like the tourmalin, the Brazilian emerald, &c. which are rendered electrical by any alteration of their temperature, be it from cold to heat, or from heat to cold; but for a full and particular account of thoſe facts, which properly belong to the ſcience of electricity, ſee the articles ELECTRICITY, ELECTRICS, and EXCITATION.

The method of determining high degrees of heat, from the progreſs of cooling, depends upon the following obſervation. Sir Iſaac Newton, conſidering the progreſs of cooling, was led to ſuppoſe, that the heat loſt by any body originally at a high temperature, in equal ſmall portions of time, is as the heat exiſting in it; (reckoning the heat in the body, equal to its exceſs above that of the ſurrounding atmoſphere,) that is, taking the times in arithmetical progreſſion. The portions of heat loſt in thoſe times would be in a geometrical one. The truth of this ſuppoſition has been ſufficiently ſhewn by ſubſequent experiments, the reſult of which has not differed much from the theoretical determinations. Hence we have the following practical rule for determining the high temperature to which a body has been expoſed, from its ſubſequent progreſs of cooling.

Meaſure the time in minutes that elapſes from the hotteſt ſtate of the body (which is the degree ſought,) to ſuch a ſtate of lower temperature as will allow the application of a common thermometer to the body in queſtion, and call this number of degrees A; then having applied the thermometer, ſet down the temperature, which is indicated by the ſame, at the expiration of each ſucceſſive minute, until you have obtained three or four terms of the ſeries, which, as has been ſaid above, will be found to be a geometrical one (omitting, however, trifling differences.) Now, ſince from thoſe few terms it is eaſy to determine any other terms of the ſame ſeries, by the well known arithmetical rules; find ſo many terms of the ſeries aſcending, as are equal to the number of units in A; and the laſt term of the ſeries, thus found, will be the degree of temperature of the body in its hotteſt ſtate. An example will eaſily illuſtrate the application of this rule. Suppoſe it be required to determine the temperature of a piece of red-hot iron at the time that it came out of the forge. Look at the watch the moment the iron is taken out of the fire, and note the minute. Find by trials when the thermometer may be ſafely applied to the iron, *viz.* when the heat is not ſufficient to rarefy the mercury of the thermometer beyond the limit of its ſcale, and when this is practicable, obſerve the temperature of the iron, and the correſponding time as indicated by the watch. Suppoſe, for inſtance, that when the temperature of the iron was 250°, four minutes had elapſed ſince the commencement of the obſervation; therefore in this experiment A is equal to 4. Let the thermometer continue in contact with the iron, and when one minute more has elapſed, let the temperature be 125°. When another minute has elapſed, let the temperature be 62½ degrees; and after this, the obſervation needs not be continued. Now we have three ſucceſſive terms of a geometrical ſeries; *viz.* 62½, 125, and 250; from which four more terms of the ſeries are to be found, (ſince A was found equal to 4,) and the laſt of thoſe terms is the number of degrees indicating the temperature ſought. By dividing 250 by 125, or the latter by 62½, we have the quotient 2, (or nearly 2) which is the multiplier of the ſeries, and therefore multiplying 250 by 2, we have the term 500, which multiplied by 2, gives the next term 1000, which multiplied by 2, gives 2000; and laſtly this term multipled by 2, gives the fourth term 4000; hence we conclude, that when the iron was taken out of the furnace, its temperature was 4000 degrees. The laſt term of the ſeries may be found out by other means, but we have choſen the eaſieſt, for the conveniency of all readers. The two ſeries are annexed.

Time elapſed in minutes.	Correſponding heat.
0.	4000°.
1.	2000.
2.	1000.
3.	500.
4.	250.
5.	125.
6.	62½.

Inſtead of minutes, the intervals of time may be half minutes, or hours, or, in ſhort, of any other denomination; provided they be all equal.

Cooling *of liquors*, in *Domeſtic Economy*, is a practice of ancient origin, and of general prevalence in warm countries, and, during the heat of ſummer, even in colder climates. This practice, as ſome have thought, is referred to by Solomon, in the book of Proverbs (ch. xxv. 13.); but however this be, evidences of it are very numerous in the works of the Greeks and Romans. Ice and ſnow were generally uſed for this purpoſe, and repoſitories were conſtructed for keeping theſe cooling materials. That the ſnow was preſerved in pits or trenches is aſſerted by many; particularly by Seneca (Quæſt. Natur. iv. 13.) and Pliny (H. N. l. xix. 4.) When Alexander the Great beſieged the city of Petra, he cauſed thirty trenches to be dug, and filled with ſnow, which was covered with oak-branches, and which was kept in that manner for a long time (Athenæi Deipnos. iii. p. 124.) Plutarch ſays (Sympos. vi. Quæſt. 6.), that a covering of chaff and coarſe cloth is ſufficient; and a like method is now practiſed in Portugal. Where the ſnow has been collected in a deep gulph, ſome graſs or green ſods, covered with dung from the ſheep-pens, are thrown over it; and under theſe it is ſo well preſerved, that it is ſent through the whole ſummer for the diſtance of 60 Spaniſh miles to Liſbon. When the ancients wiſhed to have cooling liquors, they either drank the melted ſnow, or put ſome of it in their wine, or they placed jars filled with wine in the ſnow, and ſuffered it to cool there as long as they thought proper. The diſſipated and luxurious Heliogabalus cauſed whole mounts of ſnow to be heaped up in ſummer to cool the air (Lamprid. Vit. Heliogab. c. 23.) That ice was alſo preſerved for the like purpoſe is probable from the teſtimony of various authors, Pliny, Seneca, &c.; but it appears not to have been uſed ſo much in warm countries as in the northern. At preſent ſnow is employed in Italy, Spain, Portugal; but in Perſia, ice. The art of cooling water without ſnow or ice was ſoon ſuggeſted to mankind, by obſerving, that it became cold more ſpeedily when it had been previouſly boiled, or at leaſt warmed, and then put in a veſſel among ſnow, or in a place much expoſed to the air. Pliny (H. N. l. xxxi. 3. 23.) ſeems to aſcribe this to the invention of Nero; and a jocular expreſſion of Suetonius (Vit. Ner. c. 48.) renders it probable, that he was fond of water thus cooled. But this method was much more ancient than Nero; for it ſeems to have been known to Hippocrates (De Morb. Vulgar. lib. vi. 4.); and Ariſtotle was acquainted with it; for he ſays (Meteorol. i. cap. 12.) that ſome were accuſtomed, when they wiſhed water to become ſoon cold, to place it firſt in the ſun and ſuffer it to become warm. He relates alſo, that the fiſhermen near the Black Sea poured boiling water over the reeds, which they uſed in fiſhing on the ice, to cauſe them to freeze ſooner. See alſo Galen, in lib. vi. Hippocrat. de Morb. Vulg. Comment. 4, 10. Athenæus remarks (Deipnos. iii.) that the pitchers filled with water, which had become warm by ſtanding through the whole day in the ſun, were kept continually wet during the night, by ſervants deſtined to that office, and in the morning they were bound round with ſtraw. In the iſland Cimolus, water which had become warm in the day-time was put into earthen jars, and depoſited in a cool cellar, where it became as cold as ſnow. From theſe facts it appears to have been a general opinion, that water which had been warmed or boiled, was ſooneſt cooled, and acquired a greater degree of refrigeration. The ſame opinion prevails at preſent in the ſouthern countries of Aſia, and perſons there let their water boil before they expoſe it to the air to cool. The experiments, however, that have been made on this ſubject, have given different reſults. Beckmann (ubi infra) inclines to the opinion, that the cooling of water in ancient times is not to be aſcribed ſo much to the boiling as to the keeping of the jars continually wet, and to the air to which they were expoſed. See Congelation and Freezing, and alſo the preceding article.

Another method of cooling water ſeems to have been known to Plutarch. It conſiſted in throwing into it ſmall pebbles or plates of lead (Sympoſ. vi. 5.)

The practice of cooling liquors, at the tables of the great, was not uſual in any country beſides Italy and the neighbouring ſtates, before the end of the 16th century. In the middle of that century, there were no ice-cellars in France. Towards the end of this century, under the reign of Henry III., the uſe of ſnow muſt have been well known at the French court, though it appears that it was conſidered by the people as a mark of exceſſive and effeminate luxury. Towards the end of the 17th century, this luxury muſt have been very common in France. At that period there were many who dealt in ſnow and ice; and that was a free trade which every one might carry on: but ſoon after government farmed out a monopoly of cooling waters.

The method of cooling liquors by placing them in water, in which ſalt-petre has been diſſolved, could not be known to the ancients, becauſe they were unacquainted with that ſalt. This property of ſalt-petre was firſt diſcovered in the firſt half of the 16th century; and it was not remarked till a long period afterwards that it belongs alſo to other ſalts. The Italians were the firſt perſons by whom it was employed; and about the year 1550, all the water, as well as the wine, drunk at the tables of the great and opulent families at Rome, was cooled in this manner. Towards the end of the 16th century this method of cooling liquors was well known. Mr. Beckmann ſays, that he cannot determine who firſt conceived the idea of mixing ſnow or ice with ſalt-petre, and other ſalts, which increaſe the cold ſo much, that a veſſel filled with water, placed in that mixture, is congealed into a ſolid maſs of ice, that may be uſed on the table, but the earlieſt account of it he has been able to find is in a work of Latinus Tancredus, a phyſician and profeſſor at Naples, who, in his book, "De Fame et Siti," publiſhed in 1607, ſpeaks of this experiment. In 1626 Sanct. Sanctorius, in his Commentary on the Works of Avicenna, relates, that, in the preſence of many ſpectators, he had converted wine into ice, not by a mixture of ſnow and ſalt-petre, but of ſnow and common ſalt. When the ſalt, he ſays, was equal to a third part of the ſnow, the cold was three times as ſtrong as when ſnow was uſed alone. Lord Bacon, who died in 1626, ſays, that a new method had been found out of bringing ſnow and ice to ſuch a degree of cold, by means of ſalt-petre, as to make water freeze. This, he tells us, can be done alſo with common ſalt; and he adds, that in warm countries, where ſnow was not to be found, people made ice with ſalt-petre alone; but that he had never tried the experiment. Mr. Boyle, who died in 1691, made experiments with various kinds of ſalt; and he deſcribes, how, by means of ſalt, a piece of ice may be frozen to another ſolid body. Des Cartes ſays, that, in his time, this was a well-known phenomenon, but highly worthy of attention. Since that period, the art of making ice has been mentioned in the writings of all philoſophers, where they treated on heat and cold. Towards the end of the 17th century, the French began to congeal all kinds of well-taſted juices, which were ſerved up as refreſhments at the tables of the great and wealthy. This was a grand invention for the art of cookery, and afterwards it became common, eſpecially in the laſt century, and ſince that time the confectioners have univerſally practiſed it. Beckmann's Hiſt. of Inventions, vol. ii. See Freezing and Ice.

Cooling *medicines*, thoſe which have a tendency to diminiſh febrile heat, to allay thirſt, and to leſſen the activity of the circulation. They conſiſt chiefly of diluents, acids, and neutral ſalts. With the uſe of theſe a cooling regimen is commonly combined, which conſiſts in a free employment of thin watery drinks, and a forbearance from every thing ſtimulating; ſuch as animal food and fermented or ſpirituous liquors. Occaſional laxatives and gentle diaphoretics contribute to the ſame purpoſe. See Refrigerants.

COOLI-POU, in *Geography*, a port of Chineſe Tartary; 5 miles N. of Tie-ling-Hotun.

COOLLO, a town of Hindooſtan, in the country of Oriſſa; 39 miles S.W. of Cattack.

COOLOOME, an Indian town, ſituated on the W. ſide of Talapooſe river. See Talapoose.

COOM, a term for ſoot that gathers over an oven's mouth: alſo for that black greaſy ſubſtance which works out of the wheels of carriages, and with which the axle-trees and boxes have been daubed or ſmeared over, in order to leſſen friction, and make them run eaſy.

Coom, or ſoot, is ſometimes uſed in medicine, infuſed in wine with other ingredients, as an anti-hyſteric, and againſt palpitations of the heart, &c. The ſpirit of ſoot is alſo uſed for the ſame intentions, and in cephalic caſes.

COOMB, or *Carnock of wheat*, according to the 9th and 51ſt Henry III., 12th Henry VII., &c. was, 256 ℔ troy = 210.6614 ℔ avoirdupoiſe = 2 ſtrikes = 16 pecks = 32 gallons = 256 pints or pounds.

Coomb, *Coom, or ſack of corn*, is = 2 long ſtrikes = 4 Wincheſter buſhels = 16 pecks = 32 dry gallons = 128 dry quarts = 256 dry pints = 8601.6 cubic inches = 4.97 cubic feet = 1.843621 cubic yards = 17.32142 cubic links. In ſome of the fen diſtricts it conſiſts of 4 buſhels, and each buſhel of 8 gallons and a quart.

COOMBE Hill *Canal*, in *Geography*, is a ſhort canal, in Glouceſterſhire, whoſe principal trade conſiſts in carrying coals from the pits to the Severn river. See Canal.

COOMINGS, in *Naval Architecture*. See Coamings.

COOMTAH, in *Geography*, a town of Hindooſtan, in the country of Berar; 45 miles N.E. of Nagpour.

COOP, in *Rural Economy*, a provincial term, ſometimes applied to a tumbril or cart encloſed with boards, to carry dung, ſand, grains, &c. See Cart.

Coop, alſo ſignifies a pen, or encloſed place, where lambs, poultry, &c. are ſhut up, to be fed or fattened.

Coop's *Town*, in *Geography*, a town of America, in the ſtate of Maryland, and county of Harford; 12 miles N.W. of Harford, and 22 north-eaſterly of Baltimore.

COOPA, a town of Perſia, in the province of Irak; 30 miles E.N.E. of Iſpahan.

COOPER, Samuel, in *Biography*, a miniature painter, whoſe works are deſervedly held in the higheſt eſtimation. He was born in London in 1609, and was inſtructed by his uncle, Hoſkins, who was himſelf a limner of conſiderable merit. The ſcholar, however, ſoon ſurpaſſed his maſter in the variety of his tints, the clearneſs of his carnations, and the beautiful management of his hair. The works of Vandyke were the models upon which he formed his ſtyle; and ſo perfect, yet ſo bold, is the imitation, that were ſome of Cooper's pictures magnified to the ſize of life, they would ſcarcely loſe by their compariſon with the fineſt heads of the great Flemiſh maſter. He was the firſt who gave to his miniatures the freedom and ſtrength of oil painting; and had his ſkill in drawing the other parts of the body been equal to that which he evinced in the face, his works might have challenged the moſt ſcrutinizing eye of criticiſm. He ſeems, however, to have been conſcious of his defects, and, probably on that account, left many of his fineſt pictures with the neck and arms unfiniſhed. It would far exceed our preſent limits to enumerate even the beſt of Cooper's works. His portrait of Oliver Cromwell, which was lately in the poſſeſſion of ſir Thomas Frankland, a deſcendant of Oliver, is deſcribed as a maſter-piece of character, and was engraved by Vertue. Mr. Walpole mentions ſome of his other productions in the cloſet of queen Caroline, at Kenſington; particularly a fine portrait of general Monk, of which the head only is finiſhed. He was employed ſome time by the court of France, and lived ſeveral years in Holland. He died in London, May 5th, 1672, and was buried in Pancras church, where a monument is erected to his memory. Walpole's Anecdotes.

Cooper, Alexander, was the brother of the preceding artiſt, and, with him, received inſtruction in miniature painting from their uncle, Hoſkins. We learn from Walpole, that Alexander painted landſcapes and figures in water colours, as well as portraits. The ſame author mentions the ſtory of Diana and Actæon by this maſter, at Burleigh. He reſided ſome time at Amſterdam, and ultimately entered into the ſervice of queen Chriſtina. Walpole's Anecdotes.

Cooper, Richard, a painter and engraver, a reſident of Edinburgh, who flouriſhed in 1730. Amongſt other works, he engraved the portrait of William Carſtares, and that of Andrea Allen, the painter, after William Robinſon.—Mr. Strutt mentions another *Richard Cooper*, who reſided at London, and flouriſhed in 1762. Like the former artiſt, he engraved portraits. One of his beſt prints repreſents the five children of Charles I., accompanied by a great dog, from a picture of Vandyke. Other artiſts of the name of Cooper are mentioned by Heinecken. Strutt.

Cooper, or Couper, Thomas, a learned prelate of the ſixteenth century, was born at Oxford about the year 1517, and educated in grammar learning in the ſchool joining to St. Mary Magdalen College; and afterwards ſtudied in that college, where he took the ſeveral degrees, and ſucceeded to a fellowſhip. When queen Mary came to the throne, he declined the purſuits of divinity for the ſtudy of phyſic, being a ſound proteſtant in principle. Upon the death of that ſovereign, he reſumed his former ſtudies, and became a frequent and celebrated preacher. He was made dean of Chriſt-Church in Oxford, and was for ſeveral years vice-chancellor of the univerſity. In 1569, he was inducted to the deanery of Glouceſter; and, in the following February, was conſecrated biſhop of Lincoln. His diſtinguiſhed merit and great zeal, in the performance of the duties of his high office, recommended him to his ſovereign's favour, who cauſed him to be tranſlated, in 1584, to the rich biſhopric of Wincheſter, where he became celebrated for his learning, and for the exemplarineſs of his conduct. Soon after his conſecration, he went and reſided in his new dioceſe; but being apprehenſive of danger from the papiſts, he petitioned the privy council to ſuppreſs their boldneſs. Among other methods propoſed by the biſhop, were the following, which exhibit the true ſpirit of the times: "That an hundred or two of obſtinate recuſants, luſty men, well able to labour, might, by ſome convenient commiſſion, be taken up, and ſent into Flanders, as pioneers and labourers; whereby the country would be diſburthened of a company of dangerous people: and the reſt that remained be put in ſome fear." In 1588 he preached at St. Paul's Croſs, November 17th, being the day of public thankſgiving, as well for the queen's acceſſion to the throne, as for the ſignal victory obtained over the Spaniſh Armada. He died at Wincheſter, April 29th, 1594, and was buried in the cathedral there, on the ſouth ſide of the choir, a little above the biſhop's ſeat. His publications were numerous, among which are, 1. "The Epitome of Chronicles, from the 17th year after Chriſt to 1540, and thence afterwards to the year 1560." A part of this work was compoſed by Thomas Lænquet, a young man of 24 years of age, who died before he could complete what he had taken in hand. 2. "Theſaurus Linguæ Romanæ et Britannicæ, et Dictionarium Hiſtoricum et Poeticum, Lond. 1565." This work was ſo much eſteemed by queen Elizabeth, that ſhe endeavoured to promote the author as high as poſſible in the church. To theſe may be added, "An Expoſition of certain Parts of the Old Teſtament;" and "Sermons on various Subjects." Biſhop Cooper's character is repreſented by writers in a very advantageous light. "He was," according to A. Wood, "furniſhed with all kinds of learning, almoſt beyond all his contemporaries; and not only adorned the pulpit with his ſermons, but alſo the commonwealth of learning with his writings." Many other teſtimonies might be adduced, in favour of the high reputation to which he attained with his contemporaries, among theſe is that of the celebrated ſir John Harrington. Biog. Brit.

COOPER, ANTHONY ASHLEY, firſt earl of Shafteſbury, one of the ableſt perſons, and moſt diſtinguiſhed miniſters of the 17th century, was ſon of ſir John Cooper of Rockborn, in the county of Southampton, bart., by Anne, daughter and ſole heireſs of ſir Anthony Aſhley of Winborne St. Giles, in the county of Dorſet, from whom he inherited an eſtate of 8000*l.* per annum. He was born at Winborne, July 22, 1621, and educated with the greateſt care under the eye of his parents, during his infancy, in which he diſcovered ſuch talents, that extraordinary things were predicted of him, while he was yet a boy. Before he was ten years of age, he had the misfortune to loſe his father; at fifteen he became a fellow-commoner of Exeter college Oxford, under the tuition of the celebrated Dr. Prideaux, who was then rector of it. At the univerſity, where he remained but two years, he obtained a character for great aſſiduity, and extraordinary genius. From Oxford he removed to Lincoln's Inn for the ſtudy of the law, and before he had completed his nineteenth year, he was choſen member of parliament for Tewkeſbury. This was in the year 1640; and, at the commencement of the civil war, he adhered to the king's ſide, though he was always a friend to peace, and thought conceſſions ſhould be made by both parties to attain it. To accompliſh this great object, it is ſaid by the great Mr. Locke, that he repaired to the king at Oxford, and propoſed a method of putting an end to the war, by treating with the parliamentary garriſons, and promiſing them amneſty for the paſt, and full ſecurity for liberty in the future. The plan did not ſucceed; and when ſir Aſhley found himſelf ſuſpected by the court, and that his perſon was in conſiderable danger, he went over to the parliament party, by whom he was kindly received, as well on account of his great talents, as for the influence which his property muſt create. He raiſed forces in Dorſetſhire, and in 1644 he rendered the cauſe in which he acted ſome very ſignal ſervices. He ſeems even at this period to have been looked up to by the royal party, ſince he was truſted with private negociations between the king and Denzil lord Hollis, at the treaty of Uxbridge, for which he was afterwards queſtioned, and ſeverely threatened, in parliament. After the battle of Naſeby, he attempted to check the overgrown power of parliament, by exciting the "Club men," a body of people in ſeveral counties, encouraged to take up arms, to declare themſelves as a middle party, and to inſiſt upon a ſort of treaty by which they might be reſtored to the benefits of the law, and the protection of the conſtitution. The plan was in ſome meaſure executed; Fairfax received their propoſals, and promiſed to communicate them to parliament, but Cromwell, and other leaders of that party, perceiving that no time was to be loſt, attacked the club-men without mercy, killed great numbers of them, and diſperſed the reſt. The ſcheme was abandoned, but the author of it contrived ſo as not only not to involve himſelf in their fate, but to obtain ſhortly after the office of high ſheriff of the county of Wiltſhire. Owing either to his great influence in the country, or to the warineſs of his own well-planned ſchemes, he was elected a member of the convention, which ſucceeded to the long parliament diſmiſſed by Cromwell; and, in 1754, we find him a member of parliament, and one of thoſe who proteſted againſt the tyrannical government of Cromwell. He was on other occaſions a ſtrong, though perhaps neither a ſteady nor uniform, oppoſer of the protector, as he cauſed himſelf to be ſtyled. See CROMWELL. Sir Anthony was nevertheleſs choſen by the protector to be one of his privy council; and it has been aſſerted, that he even ſought an alliance by marriage with the baronet's daughter. Dr. Kippis, however, who inveſtigated the matter, gives no credit to this part of the charge. When Richard Cromwell was depoſed, ſir Anthony was appointed by the rump parliament one of the council of ſtate, and a commiſſioner for the managing army, although, it is now well known, that he was, at the ſame time, engaged in a plan to reſtore Charles II. to the throne, notwithſtanding the ſtrong proteſtations which he made of his innocence when queſtioned on the buſineſs, by which he obtained an acquittal. Like other diſcerning men, he foreſaw, from exiſting circumſtances, that a change in favour of monarchy muſt eventually take place, and therefore he took care to ſecure a claim of merit in the reſtoration, which he promoted with great zeal and aſſiduity, when he perceived an evident tendency to that event. In 1660, he was a member of the healing parliament, and one of twelve who were deputed to invite the return of the king; who, in grateful remembrance of his ſervices, made him a privy counſellor; gave him a commiſſion for the trial of the regicides; and, in the courſe of a year, raiſed him to the rank of peer of the realm, by the title of baron Aſhley of Winborne St. Giles. He was ſoon after appointed chancellor and under-treaſurer of the exchequer, and, upon the death of lord Southampton, one of the lords commiſſioners of the treaſury. He was a member of the celebrated cabal miniſtry, in which, from his ſuperior talents and forcible eloquence, he took a deciſive lead. He continued in the councils and confidence of the king his maſter, during the happieſt part of his reign, and ſtood as high in his favour as any of his miniſters. He was afterwards appointed to the lord lieutenancy of the county of Dorſet, and on the twenty-third of April 1672, was created baron Cooper of Pawlet, and earl of Shafteſbury. In the following November, he was raiſed to the higheſt office of ſtate, *viz.* that of lord chancellor of England, the duties of which ſtation he executed with equal ability and integrity. In his other capacities, of a miniſter and privy counſellor, he has been variouſly deſcribed; but he is allowed, on all hands, to have been one of the ableſt men, and one of the moſt accompliſhed orators that have adorned this country. "The ſhort time," ſays one of his biographers, "that he was at the helm, was a ſeaſon of ſtorms and tempeſts, and it is but doing him ſtrict juſtice to ſay, that they could neither affright nor diſtract him. Whatever he did, he did with his might, and there was a ſpirit and dignity in his adminiſtration, which that government could never recover after he left it. He was the ſoul and genius of the miniſtry while he made a part of it; but whether he did not carry things too high, and out of the reach of all other capacities but his own, it would ſavour of raſhneſs to determine." Some hiſtorians attribute to him the arbitrary counſel of ſhutting up the exchequer, while others aſſert that he oppoſed it with all his power, and drew up a paper of reaſons againſt it. It is certain that he was an earneſt promoter of the declaration for liberty of conſcience, which, though intended principally to favour the Papiſts, probably agreed with his own real judgment, as a decided friend to religious toleration. It is generally admitted that he had no concern in the diſgraceful treaty with Lewis XIV., of which the main object was to render Charles a penſioner on the French monarch; but he was a ſtrenuous ſupporter of the Dutch war, and was guilty of adviſing the illegal meaſure of iſſuing writs for the election of members of parliament, during a receſs, and abuſing the influence of the crown to procure returns in favour of the court. He had not been more than a year in poſſeſſion of the ſeals, when he manifeſted hoſtility to the principles which governed the Stuart family; ſo that the duke of York became his enemy, and at length in Nov. 1673 got him removed from his office. After he had quitted the court, he continued to make a great figure in parliament, and for his warmth in maintaining that a prorogation for fifteen months was equal to a diſſolution, he was committed to the tower, where he remained a priſoner full thirteen months, when he ſubmitted and was releaſed, and the precedent made in his caſe was afterwards reverſed. Previouſly to this, he had ſhewn himſelf a friend to civil and religious liberty, by oppoſing the teſt-bill introduced into the houſe of peers by lord Danby, and on this buſineſs, he is ſaid to have diſtinguiſhed himſelf more than he had ever done. He managed the oppoſition to lord Danby's adminiſtration with ſo much dexterity and vigour, that it was found abſolutely impoſſible to do any thing effectually in parliament, without changing the ſyſtem which then prevailed. The king accordingly diſmiſſed all his privy council at once, and formed a new one, making lord Shafteſbury the lord preſident. He had, however, already drawn upon himſelf the implacable hatred of the duke of York, by ſteadily promoting, if not originally inventing, the project of an "excluſion bill." To him alſo is imputed the contrivance of the Popiſh plot in 1678; which, if it were not a fiction of his own, was urged by him with the greateſt virulence againſt the court party, ſo as to be the means of throwing out lord Danby's adminiſtration; and there is no doubt that he was the author and promoter of all the perſecutions which followed on this buſineſs, as well in the inferior courts as in parliament, with a view of quaſhing the popiſh party entirely, and of excluding the duke from the ſucceſſion, which were points he had moſt at heart, and which he purſued with an indefenſible ſeverity. Amidſt many violent and very unjuſt proceedings, he was the author of a meaſure of ſignal national benefit, the paſſing of the "Habeas Corpus act;" to the protection of which he had occaſion to appeal ſhortly after, for his own perſonal ſecurity. His new employment was ſhort-lived, as he was diſmiſſed after holding it little more than five months; and ſome of the practices to which he had recourſe againſt the papiſts, were turned againſt himſelf. He was applied to by a man pretending to make diſcoveries relating to the popiſh plot, and the murder of ſir Edmundbury Godfrey, provided that for this ſervice he might obtain a pardon. The man was conducted to the privy council; but inſtead of giving the information expected, he charged the noble earl with endeavouring to ſuborn him. Upon this information his lordſhip was apprehended on the 2d of July 1681, and after an examination by his majeſty in council, he was committed to the tower, where he remained four months, notwithſtanding he took every legal method to obtain a trial, or to be admitted to bail, according to the principles of the habeas corpus act. At length, on the 24th of October, a bill was preſented to the grand jury at the ſeſſions houſe in the Old Bailey, againſt his lordſhip, for high treaſon. Witneſſes were brought againſt him, but their characters were too infamous to permit their evidence to have the ſmalleſt degree of weight. Conſiderable ſtreſs was laid upon the draught of an aſſociation found in his ſtudy, which, however, was neither written nor ſigned by the noble earl; and the jury, after ſome conſideration, threw out the bill, and he was acquitted, amidſt the acclamations of the people. A medal was ſtruck on the occaſion, which was the cauſe of a very bitter ſatirical poem, from the pen of Dryden, who had before perſonified Shafteſbury, as the great counſellor of rebellion, in his "Abſalom and Achitophel."

As ſoon as he was at liberty, lord Shafteſbury endeavoured to vindicate himſelf by law, and brought an action againſt a perſon for ſpeaking of him as a traitor: this he thought proper to diſcontinue before it came to trial. For many years he had reſided at Thanet-houſe in Alderſgate-ſtreet; but finding his health decay, his ſpirits declining, and the times becoming more ſerious, he withdrew into Holland, where he arrived in November 1682, and in the following January he died at Amſterdam in the ſixty-ſecond year of his age. His body being embalmed was tranſported to England, and buried with his anceſtors, at Winborne St. Giles. Much has been written concerning the character of this nobleman. As a public man, he was, ſays Dr. Kippis, guilty of manifold inconſiſtencies, and ſubmitted to ſhameful compliances. "There were, however," adds the ſame candid and excellent biographer, "three points in which, through the uſual tenor of his life, the earl of Shafteſbury was entitled to applauſe. Theſe were, his attention to the protection and advancement of trade and commerce; his endeavours to counteract the growing power of France; and his attachment to the cauſe of religious liberty. He wrote an eſſay on toleration, ſtill preſerved in the family, which was evidently the ground work of Mr. Locke's admirable letters on that ſubject. Several of the meaſures, propoſed and ſupported by him, were preparatory to thoſe that were adopted at the Revolution, and he contributed, by his ardour, to raiſe and animate the ſpirit, which, in the end, produced the event, ſo that amidſt all his obliquities and faults, he deſerves to be celebrated, as having been no ſmall benefactor to the free conſtitution of England." He left in MS. a hiſtory of his own times; and ſome of his ſpeeches have been publiſhed. He was thrice married, but left only one ſon, who ſucceeded him in his eſtates and titles, and who died in November 1699, and was ſucceeded by Anthony his ſon and heir, of whom we are now to give an account.

COOPER, ANTHONY ASHLEY, third earl of Shafteſbury, was born Feb. 26, 1670-71, at Exeter-houſe, London, which was at that time the town-reſidence of his grandfather, who undertook the ſuperintendance of his education. He firſt entruſted him to the care of a learned lady of the name of Birch, under whom he made ſuch rapid advances in the Greek and Latin languages, as to be able to read the common authors in each before he was eleven years old. He was then placed in a private ſchool, where he continued till the death of his grandfather, when he was ſent to Wincheſter; where, on account of the inſults which he ſuffered, through the hatred borne to his grandfather's memory by the friends to arbitrary power, he remained but a ſhort time, and, in 1686, he commenced his travels under the care of a well qualified tutor. With him he ſpent much time in France and Italy, improving himſelf in the languages and accompliſhments of thoſe countries, and laying the foundation of the knowledge and taſte for which his own ſubſequent writings were juſtly celebrated. He returned to England in 1689, and was offered a ſeat in parliament, which for the preſent he declined, wiſhing rather to employ all his leiſure in the improvement of his mind, and in extending his knowledge on ſubjects of the greateſt importance. In theſe views he ſucceeded, and laid a foundation in learning which was accurate, extenſive, and truly liberal. After purſuing the ſtudies congenial to his temper, with much ardour and almoſt unabating diligence, for nearly five years, he was elected member of parliament for Poole. In this high ſtation he ſhortly had an opportunity of expreſſing that attachment to liberty, by which he was diſtinguiſhed through the whole of his life, and of conciliating the houſe to the object which he had in view. The occaſion was the introduction of a bill for granting, among other things, the aid of counſel to perſons indicted for high-treaſon. Lord Aſhley had prepared a ſpeech for the purpoſe, but when the moment came, in which he was to deliver it, he was utterly unable to proceed. After a ſhort pauſe, he addreſſed the ſpeaker. "If I, ſir, who only riſe to give an opinion on the bill now depending, am ſo confounded, that I am unable to expreſs the leaſt of what I propoſed to ſay, what muſt be the condition of that man, who, without any aſſiſtance, is pleading for his life, and under the apprehenſion of being deprived of it?" This happy turn of thought, ſo appropriate to the occaſion, is ſuppoſed to have contributed more than any of the arguments which were urged in obtaining the juſtice for which he pleaded. The neceſſity of this wiſe and humane law has been of late years amply manifeſted by the conduct of certain great law officers, who took the very moderate ſpace of ſeven, nine, and eleven hours in opening caſes of *ſuppoſed* high-treaſon. During the remainder of that parliament, lord Aſhley was indefatigable in the promotion and ſupport of every meaſure in favour of liberty, without regard to the perſon by whom it was introduced, influenced unqueſtionably by an attention to the public good, without feeling the paltry motives which too frequently actuate political men. At the diſſolution in 1698, he reſigned his pretenſions to a ſeat in the houſe, on account of ill health, and with a view alſo of ſecuring more time for literary purſuits. He went to Holland under the aſſumed character of a ſtudent in phyſic: here he cultivated an acquaintance with Bayle, Le Clerc, and other men of celebrity, and it was not till a ſhort time before he left the country that he made his name known. Before his lordſhip's return an imperfect and ſurreptitious edition of his "Enquiry concerning Virtue," was publiſhed in a moſt unhandſome manner by Mr. John Toland, who, ſays Dr. Kippis, in this tranſaction, repaid with ingratitude a very generous benefactor. His lordſhip bought up the edition, and ſet about compleating the treatiſe, which afterwards appeared as the ſecond volume of the "Characteriſtics." Soon after lord Aſhley's return to England, he became, by the deceaſe of his father, the earl of Shafteſbury, but he did not take his ſeat in the houſe of peers till the beginning of the year 1700-1, when his friend, lord Somers, ſent a meſſenger to acquaint him that his preſence was neceſſary, on account of the Partition-treaty, which, at that time, was under the conſideration of parliament. During the remainder of the ſeſſion he attended his duty as frequently as the ſtate of his health permitted, zealouſly ſupporting the meaſures of king William, who was, at that period, negociating the grand alliance. That ſovereign regarded the ſupport of lord Shafteſbury ſo highly, that he wiſhed to appoint him ſecretary of ſtate. This honour his health did not allow him to accept; but he was nevertheleſs aſſiduous in rendering to his majeſty advice on every important occaſion. Soon after the acceſſion of queen Anne, lord Shafteſbury retired from public life, being no longer a friend to the meaſures of the court. Miniſters now took from him the vice-admiralty of the county of Dorſet, which had been held by his family for three ſucceſſive generations. He went to Holland a ſecond time, where he ſpent two years among the learned connections, which he had already formed in that country. About this period the French prophets having excited a conſiderable diſturbance, in the nation, by their enthuſiaſtic extravagances; ſome great men recommended proſecutions and puniſhments as the only methods of ſuppreſſing them: to theſe lord Shafteſbury was decidedly inimical, thinking that ſuch meaſures would increaſe rather than cure the malady. This was the origin of his "Letter on Enthuſiaſm," which he ſent to lord Somers, then preſident of the council, which, being approved by that nobleman and others, was publiſhed in 1708, though without the name of the author, or that of the perſon to whom it was addreſſed. In the following year he publiſhed his "Moraliſts," a philoſophical rhapſody, being a recital of certain converſations on natural and moral ſubjects; and in a few months afterwards his "Senſus Communis; an Eſſay upon the Freedom of Wit and Humour, in a Letter to a Friend." In the ſame year he married Miſs Jane Ewer, the youngeſt daughter of Thomas Ewer, eſq. of Lee, in Hertfordſhire. In forming this connection, it ſhould ſeem that his lordſhip was principally influenced by the ſolicitations of his friends, rather than from any inclination of his own, or high expectations of the happineſs of that ſtate. Letters to this effect are preſerved in the Biographia Britannica. By his lady, to whom he was previouſly related, he had an only ſon Anthony, afterwards earl of Shafteſbury.

In 1710 the noble lord publiſhed his "Soliloquy, or Advice to an Author;" after which his health obliged him to try the effects of a warmer climate. He accordingly, in 1711, paſſed through France and Piedmont, and fixed his reſidence at Naples, where he died on the 4th of February, 1712-13, at the early age of forty-two. During his abode at Naples, he finiſhed his "Judgment of Hercules," and the "Letter concerning Deſign," which have ſince been added to the "Characteriſtics." It was in 1711 that the firſt edition was publiſhed of all the Characteriſtics, in the ſame order in which they now ſtand: but this publication not being entirely to his lordſhip's ſatisfaction, he chiefly employed his time abroad in preparing his writings for a more elegant edition, which was given to the world ſoon after his deceaſe, in the year 1713. The ſeveral engravings, that were then firſt interſperſed through the volumes, were all invented by himſelf, and deſigned under his immediate inſpection. The impreſſion of the "Characteriſtics of Men, Manners, Opinions, and Times," in 3 vols. 8vo., contains the whole of his works which he intended to ſubmit to the judgment of the public. In the year 1716, ſome of his private letters upon philoſophical and theological ſubjects were publiſhed, under the title of "Several Letters written by a noble Lord to a young Man at the Univerſity;" and in 1721, another collection of the ſame kind appeared, entitled, "Letters from the Right Honourable the late Earl of Shafteſbury to Robert Moleſworth, eſq. now Lord Viſcount of that Name; with two Letters written by the late Sir John Cropley: to which is prefixed, a large Introduction by the Editor." That editor, ſays the candid biographer already referred to, was Mr. Toland, who, in the preſent, as well as in the former caſe, aſſumed a liberty not very agreeable to the family. In their opinion, as the correſpondence was almoſt entirely of a private nature, it was on that account unfit for public view. It nevertheleſs ſet his lordſhip's integrity in the moſt amiable point of light. Lord Shafteſbury alſo wrote a preface to a volume of Dr. Whichcote's ſermons, publiſhed in 1698; and in his Letters to a young Man at the Univerſity, expatiates on the merits of Burnet, Hoadly, Tillotſon, Barrow, Chillingworth, and Hammond, as the great pillars of the church againſt fanaticiſm. But however highly he might eſteem the labours of modern divines, his principal admiration was directed to the writings of antiquity. Theſe were the conſtant ſubjects of his ſtudy, and on theſe his philoſophy was built. His favourite books were the moral works of Xenophon, Horace, the Commentaries and Enchiridion of Epictetus, as publiſhed by Arrian, and Marcus Antoninus. Theſe authors he always carried with him, in his various excurſions; and they are ſtill extant, filled with marginal notes, written in his own hand. It remains now to notice more particularly the writings of lord Shafteſbury, which, by one claſs of critics, have received the moſt extravagant applauſe, and, by another, have been the ſubjects of indiſcriminate condemnation. They have been examined with a critical eye, and in rather an elaborate manner, by Dr. Kippis, to whoſe article, in the Biographia Britannica, we refer the reader, contenting ourſelves with a brief outline. Lord Shafteſbury's Letter on Enthuſiaſm was written from excellent motives: it contains many admirable remarks, delivered in a neat and lively ſtrain; but it wants preciſion; conveys but little information; and contains ſome exceptionable paſſages. The ſame character may be given, with truth and juſtice, of "The Eſſay on the Freedom of Wit and Humour," deſigned to defend the application of ridicule to ſubjects of ſpeculative inquiry, and among others to religious opinions. His "Soliloquy, or Advice to an Author," met with more general approbation. It contains a variety of excellent matter; and what the noble lord has advanced in recommendation of ſelf-examination, and in defence of critics and criticiſm, is particularly valuable: it is evidently the reſult of the author's knowledge and refined taſte in books, in life, and manners. Lord Shafteſbury's "Enquiry concerning Virtue" obtained more general applauſe. It is ably and finely written, and maintains with great force the important truth, that virtue is the greateſt happineſs, and vice the greateſt miſery of men. This work has met with much oppoſition from thoſe who deduce the principles of virtue from ſelf-love only, and refer the obligation of it ſolely to the will of God. In this "Enquiry," the noble author appeared in the cloſe, the logical, and the didactic form. But in the "Moraliſts," he aſſumes a higher tone, and figures in a new character. Here he preſents himſelf in the mode of dialogue, and is the emulator of Plato, in the boldeſt poetic manner of that eminent philoſopher. Biſhop Hurd ranks it among the beſt compoſitions of the kind in our language. Its matter is highly valuable and important, and preſents us with a truly argumentative and eloquent defence of the doctrines of a Deity and a Providence. The "Miſcellaneous Reflections on the preceding Treatiſes, and other critical Subjects," are intended as a ſort of defence and explanation of his former works: they contain a variety of juſt and ingenious remarks, and much fine writing; but they are written in a deſultory manner, abounding with many exceptionable paſſages concerning revelation. With reſpect to the ſtyle of lord Shafteſbury, we may quote the opinion of Dr. Blair, which is at once accurate and judicious. "His language has many beauties; it is firm and ſupported in an uncommon degree; it is rich and muſical. No Engliſh author has attended ſo much to the regular conſtruction of his ſentences, both with reſpect to propriety, and with reſpect to cadence. All this gives ſo much elegance and pomp to his language, that there is no wonder it ſhould ſometimes be highly admired. It is greatly hurt, however, by perpetual ſtiffneſs and affectation. This is its capital fault. His lordſhip can expreſs nothing with ſimplicity. He ſeems to have conſidered it as vulgar, and beneath the dignity of a man of quality, to ſpeak like other men. Hence he is ever in buſkins, full of circumlocutions and artificial elegance. In every ſentence we ſee the marks of labour and art; nothing of that eaſe which expreſſes a ſentiment coming natural and warm from the heart. Of figures and ornaments of every kind he is exceedingly fond; ſometimes happy in them; but his fondneſs for them is too viſible, and having once laid hold of ſome metaphor or alluſion that pleaſed, he knows not how to part with it. What is moſt wonderful, he was a profeſſed admirer of ſimplicity; is always extolling it in the ancients, and cenſuring the moderns for want of it, though he departs from it himſelf as far as any one modern whatever. Lord Shafteſbury poſſeſſed delicacy and refinement of taſte to a degree that we may call exceſſive and ſickly; but he had little warmth of paſſion; few ſtrong or vigorous feelings; and the coldneſs of his character led him to that artificial and ſtately manner which appears in his writings. He is fonder of nothing than of wit and raillery; but he is far from being happy in it. He attempts it often, but always awkwardly: he is ſtiff even in his pleaſantry, and laughs in form like an author, and not like a man." To this Dr. Kippis adds: "On the reperuſal of the Characteriſtics, we have been clearly convinced, that the noble author was always excellent in the diſpoſition of his words, but that in the choice of them he is frequently liable to cenſure." Lord Shafteſbury, in all his works, ſhews himſelf a zealous advocate for liberty, the ſteady friend of virtue, and a true believer in natural religion. He ſometimes profeſſed himſelf a Chriſtian; but his writings, in many parts, render his faith in the divine miſſion of Chriſt very queſtionable. The noble lord left one ſon, Anthony Aſhley Cooper, the fourth earl, of whom the learned Mr. Huntingford ſays, "there never exiſted a man of more benevolence, moral worth, and true piety." To this high character Dr. Kippis gives his own teſtimony, having had the honour of enjoying his acquaintance and correſpondence. He was the author of the life of his father, in the great General Dictionary. It may not be improper to add in this place, that the tranſlator of Xenophon's Cyropedia was the honourable Maurice Aſhley Cooper, brother to the third earl.

COOPER, JOHN GILBERT, born in 1723, was of an ancient family in Nottinghamſhire. He received the early part of his education at Weſtminſter ſchool, and finiſhed his ſtudies in Trinity College, Cambridge. As an author, his firſt work was on the "Power of Harmony," formed on the model of the "Pleaſures of the Imagination." In 1749 he publiſhed "The Life of Socrates, collected from the Memorabilia of Xenophon, and the Dialogues of Plato," &c. Learned notes were added by the Rev. J. Jackſon of Leiceſter. This work was well received, though at preſent it is in no great eſtimation. In 1754 he gave to the world "Letters on Taſte," which were written in an elegant ſtyle, for which, and for the vivacity in the deſcription, they were more admired than for accuracy and depth of thought. Cooper wrote ſome papers in "The World:" his other works are all poetical, of which the principal are, "The Tomb of Shakeſpeare, a Viſion;" "Epiſtles to the Great, from Ariſtippus in Retirement;" "The Call of Ariſtippus, an Epiſtle to Dr. Akenſide;" and "A Tranſlation of Greſſet's Ver Vert." Mr. Cooper was not deſtitute of fancy, but his fancy was not always under proper regulation, and he ſometimes failed in the preciſion of his ideas. He excelled in the light, eaſy, and epiſtolary ſtrain. His ſentiments have conſiderable ſameneſs, being derived from the Shafteſburian ſchool of philoſophy, of which he was a diſciple. He was an active member of the Society for the Encouragement of Arts, Manufactures, &c.; a diligent and uſeful magiſtrate. He died in 1769, of a fit of the ſtone.

Cooper, on board a *Ship*, the perſon that looks to the caſks and all other veſſels, for beer, water, or any other liquors. He has a mate under him.

Cooper, in *Geography*, one of the Bermudas iſlands.

Cooper, a large and navigable river of America, which mingles its waters with Aſhley river, below Charleſton city, in South Carolina. Theſe form a ſpacious and convenient harbour, which communicates with the ocean, juſt below Sullivan's iſland, leaving it on the N. 7 miles S.E. of the city. Cooper river is a mile wide at the ferry, 9 miles above Charleſton.

Cooper's-*Bridge*, over the Calder river, on the road between Huddersfield and Leeds in Yorkſhire, is the place at which ſir John Ramſden's canal connects with the Calder and Hibble navigation, which now has become a place of conſiderable traffic, in conſequence of the junction of the Huddersfield canal with the other end of ſir John Ramſden's canal. See Canal.

Cooper's *Iſland*, one of the Virgin iſlands in the Weſt Indies, S. W. of Ginger iſland, uninhabited; about five miles long, and from one to two broad. N. lat. 18° 7′. W. long. 63° 5′.

Cooper's, or de Kuiper *iſland*, lies on the north coaſt of the iſland of Java, near Batavia; about 1600 feet from the iſland of Onruſt, and about one-third leſs in ſize. The Dutch company have ſeveral warehouſes in this iſland, in which they chiefly lay up coffee. At its ſouth ſide there are two pier-heads, where veſſels may load and diſcharge. Over the iſland are interſperſed ſeveral large tamarind trees, which afford an agreeable ſhade. The workmen that are employed here in the day-time, are fetched over at night to Onruſt, and two are left, as a watch, together with a number of dogs, ſo remarkably fierce, that no one dares to ſet his foot on the iſland at night.

Cooper's *Iſland*, an iſland in the Southern Pacific ocean, near the E. coaſt of the iſle of Georgia. It is a rock of conſiderable height, about five miles in circuit, and one mile from the main. At this iſle the main coaſt takes a S.W. direction for the ſpace of four or five leagues to a point, called by Cook "Cape Diſappointment." Off that are three ſmall iſles, the ſouthernmoſt of which is green, low, and flat, and lies one league from the cape. S. lat. 54° 57′. W. long. 36° 4′.

Cooper's *Town*, a poſt town, and townſhip of America, in the ſtate of New York and county of Otſego. It is the compact part of the townſhip of Otſego, and the chief town of the country round lake Otſego. It is pleaſantly ſituated at the S.W. end of the lake, on its banks, and thoſe of its outlet; 12 miles N.W. of Cherry valley, and 73 W. of Albany. It has a court-houſe, gaol, and academy. In 1789 it had only three houſes; in 1791 it contained 292 inhabitants; and in 1795, 50 houſes had been erected on an improved plan, regularly laid out in ſquares. N. lat. 42° 44′. W. long. 74° 48′.

Cooper's *Town*, a town of Pennſylvania, ſituated on the Suſquehannah river. In 1785 this was a wilderneſs; but in nine years after, it contained 1800 inhabitants, a large and handſome church, a market-houſe, a library of 1200 volumes, and an academy of 64 ſcholars. Four hundred and ſeventy pipes were laid under ground for the purpoſe of bringing water from Weſt mountain, and conducting it to every houſe in the town.

CO-OPERATE, to, in a *Military Senſe*, is to carry a well-directed plan into execution in ſuch a manner, that the troops or forces, how much ſoever divided, may act at one time, on one principle, and towards one end.

CO-OPERATOR, derived from *con*, and *opera*, labour, denotes any cauſe, natural or ſupernatural, which concurs with another to the production of an effect. Thus, nature and medicine co-operate in the cure of diſorders; and the will of man concurs with the grace of God in the performance of good works.

CO-OPERRIE Pallio. See Pallio.

COOPERS, *Company of*. See Company. Coopers are enjoined to make their veſſels of ſeaſonable wood, and to mark them with their own marks, on pain of forfeiting 3*s*. 4*d*.; and the contents of veſſels are to be obſerved under a like penalty, ſo that the beer barrel ſhall contain 36 gallons, a kilderkin 18, a firkin 9, &c. The wardens of the Coopers' company in London, with an officer of the mayor, are to ſearch all veſſels for ale, beer, and ſoap to be ſold there, and to mark thoſe that are right; and they may burn the others: and if any cooper diminiſh a veſſel by taking out the head, or any one of its ſtaves, it ſhall be burnt, and the offender forfeit 3*s*. 4*d*. Stat. 23 Hen. VIII. c. 4.

CO-OPERTURA, in *Antiquity*, a thicket or covert of wood. Chart. de Foreſt. cap. 12.

CO-OPTATION, derived from *co-opto*, I chooſe, ſignifies the admiſſion of members into any college or ſociety. Thus it was anciently applied to the choice of the augurs and pontiffs; and in modern times, to an extraordinary nomination and election of perſons of diſtinguiſhed merit into a learned ſociety.

CO-ORDINATE, ſomething of equal order, rank, or degree, with another.

CO-ORDINATION, in reſpect of cauſes, denotes an order of cauſes, wherein ſeveral of the ſame kind, order, and tendency, concur to the production of the ſame effect.

COORNHAERT, or Cuernhert, in *Biography*. See Theodore Dirk.

COOROORAA, in *Geography*, one of the Pelew iſles, the capital of which is called Pelew; which ſee.

COOS, in *Ancient Geography*, an iſland of the Ægean or Icarian ſea, near Cnidus (now called *Zia*); in which was a city of the ſame name, from which Hippocrates, the celebrated phyſician, and Apelles, the famous painter, were called *Coi*. Here was a large temple of Æſculapius, and another of Juno. It abounded in rich wines, and here were made thoſe "*Coæ veſtes*," which were tranſparent, and are ſo often mentioned by the ancient poets.

Coos, or Cohos, in *Geography*, a country of America, called *Upper* and *Lower Coos*, which lies on the Connecticut river, between 20 and 40 miles above Dartmouth college. Upper Coos is the country S. of Upper Amonooſuck river on John and Iſrael rivers. Lower Coos lies below the town of Haverhill, S. of the lower Amonooſuck. The diſtance from Upper Coos to the tide in Kennebeck river was meaſured in 1793, and found to be but 90 miles.

Coos-*Baybar*. See Cooch-*Bahar*.

COOSA, or Coosa-Hatcha, a river which riſes in the high lands of the Cherokees' country, and joining Tallapooſe, forms Alabama river. Its courſe is generally S. through the country of the Natchez, and other tribes of the Upper Creeks. It is rapid, and full of rocks and ſhoals, ſo that it is hardly navigable by canoes.

COOSADES, an Indian town on Alabama river, in America, about 60 miles above its mouth, on Mobile river; below M'Gillivray's town, and oppoſite the mouth of the Oakfuſkee.

COOSA-HATCHEE, or Coosaw, a river of America, in S. Carolina, which riſes in Orangeburg diſtrict, and after running in a S.S.W. courſe, diſcharges itſelf into Broad river and Whale branch, which ſeparate Beaufort iſland from the main land.

COOSAWATCHIE, or Coosahatchie, a poſt town of America, in the ſtate of S. Carolina, and diſtrict of Beaufort, ſituated on the S.W. ſide of Cooſa river, over which a bridge has been erected. The place is flouriſhing, having about 40 houſes, a court-houſe, and a gaol. The courts formerly held at Beaufort are held here. It is 33 miles diſtant from Beaufort, and 77 W.S.W. from Charleſton.

COOSCOOSOO, a common food among the Moors of Africa, conſiſting of a paſte made of flour in the form of ſmall grains in the manner of Italian paſtes. This is dreſſed by the vapour of broth in a round diſh, with holes like a cullender, and that is fixed in the kettle in which they boil their meat. The cooſcooſoo, contained in the deep plate or cullender, is ſlowly ſoftened, and prepared by the vapour of the broth, with which they take care to moiſten it occaſionally. This is a nouriſhing and agreeable food, and eaten by the common people either with milk or with butter, but ſuperior perſons have it dreſſed by a rich broth made with mutton, poultry, and pigeons or hedge-hogs, and mix it afterwards with freſh butter.

COOSY, Cosa, or Koss, a river of Aſia, which riſes in the mountains of Thibet, takes its courſe through Purneah, and runs into the Ganges, 20 miles E. of Boglipour in the country of Bahar.

COOT, in *Ornithology*. See Fulica *atra*.

COOTE, *Sir* Charles, in *Biography*, a diſtinguiſhed military officer in the 17th century, was the eldeſt ſon of ſir Charles Coote, who was created baronet in April 1621. He was a gentleman of great conſideration in Ireland. Upon the breaking out of the rebellion, in 1641, he had a commiſſion for a regiment of foot, and was made governor of Dublin. From this period, to the year 1652, he was engaged in a great number of important ſervices for his country. In almoſt all the conteſts of which he took a part he was ſucceſsful. After Ireland was reduced to the obedience of the parliament, ſir Charles was one of the court of juſtice in the province of Connaught, of which he was made preſident by act of parliament. Being in England at the time of the depoſing of Richard Cromwell, he went poſt to Ireland, to carry the news to his brother Henry Cromwell, and to concert with him what to do in order to maintain themſelves in their poſts. When, however, he perceived that king Charles the Second's intereſt was likely to prevail, he endeavoured to inſinuate himſelf into his favour. For this purpoſe he ſent to the king ſir Arthur Forbes, "to aſſure his majeſty of ſir Charles's affection and duty, and that if his majeſty would vouchſafe to come to Ireland, he was confident the whole kingdom would declare for him; that though the preſent power in England had removed all the ſober men from the government of the ſtate in Ireland, under the character of preſbyterians; and had put Ludlow, Corbet, and others of the king's judges in their places, yet they were generally ſo odious to the army as well as to the people, that they could ſeize on their perſons, and the caſtle of Dublin when they ſhould judge it convenient." The king did not think it prudent to accept the invitation. In a ſhort time after ſir Charles Coote, and ſome others, ſo influenced the whole council of officers, that they prevailed upon them to vote not to receive colonel Ludlow as commander in chief; they, moreover, made themſelves maſters of Athlone, Drogheda, Limerick, Dublin, and other important places for the ſervice of the king. He immediately cauſed colonel Monk to be made acquainted with the progreſs of the king's intereſt in Ireland, who urged them by every means not to reſtore the ſuſpended commiſſioners to the exerciſe of their authority. Soon after, ſir Charles Coote and others ſent to the parliament a charge of high treaſon, againſt colonel Ludlow, Corbet, Jones, and Thomlinſon. He likewiſe made himſelf maſter of Dublin-caſtle; and apprehended John Coke, chief juſtice of Ireland, who had been ſolicitor-general at the trial of king Charles I. Notwithſtanding this, parliament thought themſelves ſo ſure of him in their intereſt, that he received their vote of thanks on the 5th of Jan. 1659—60. On the 19th of the ſame month he was appointed one of the commiſſioners for the management of the affairs of Ireland. Before thoſe commiſſioners declared for king Charles, they inſiſted upon certain things relating to their intereſt as members of that nation. On the 6th of September 1660, ſir Charles Coote, on account of his many and very valuable ſervices for the royal cauſe, was created baron and viſcount Coote, and earl of Montrath in the queen's county. He was alſo appointed one of the lords juſtices of Ireland, but he did not long enjoy theſe marks of his ſovereign's favour, for he died in December 1661, and was ſucceeded in his eſtate and titles by his ſon Charles, the ſecond earl. Dr. Leland aſſerts that Coote and his father had engaged in the parliamentary ſervice not from principle, but intereſt. Dr. Kippis, however, doubts the aſſertion upon the ground that the Cootes were zealous preſbyterians, and therefore he thinks it highly probable that they were influenced, at leaſt in part, by their real ſentiments, civil and religious, and eſpecially by their averſion from popery.—Biog. Britan.

COOTE-HILL, in *Geography*, a market and poſt town of the county of Cavan, Ireland, near the borders of Monaghan. It was much neglected by the late proprietor, but the preſent one is improving its appearance by public buildings, ſuch as a market-houſe and ſhambles; and by obliging tenants to build on a plan adopted by him. It contains ſix houſes of worſhip, beſides the pariſh-church. In the ſale of its markets it is the moſt conſiderable town in the county. The ſale of linen alone averages 4000 *l.* weekly, principally of ſheetings, in which branch no market in Ireland

land can vie with it. It is fifty-three Iriſh miles N.W. from Dublin, and ten miles N.E. from Cavan. Coote's ſurvey of Cavan, &c.

COOTS-TOWN, a town of America, in the ſtate of Pennſylvania and county of Berks, is ſituated on a branch of Sauhoca creek, which is itſelf a branch of the Schuylkill river. It contains forty houſes, and a German Lutheran and Calviniſt church. It is diſtant ſeventeen miles N.N.E. from Reading, and ſeventy-three N.W. by N. from Philadelphia.

COOTWYCK, or KOOTWYCX, JURIAN, in *Biography*, a goldſmith, born at Amſterdam in 1714, who applied himſelf after the example of his countryman Ploos Van Amſtel, to the imitation of drawings by means of etching and aquatinta Amongſt his works, are ſeveral prints from the deſigns of Backhuyſen, Berghem, and other Dutch and Flemiſh maſters; and likewiſe ſome, which it is ſuppoſed he executed from ſketches of his own. One of his prints in imitation of black and white chalk, repreſenting an old woman ſitting in a chair, with a paper in her hand, is dated 1748. Heinecken.

COP, WILLIAM, born at Bale in Switzerland, took his degree of doctor in medicine at Paris, in the year 1495, and ſoon became ſo diſtinguiſhed by his ſuperior knowledge and abilities, that Ramus, no incompetent judge, called him, "Unica nobilium medicorum gloria." He was phyſician to Lewis the twelfth, and to Francis the firſt, and ancient to the Faculty of Medicine at Paris. He tranſlated the work of Paulus of Ægina, de Ratione Victus, which was publiſhed at Paris in the year 1510, in 4to.; and the following year at Straſburg; alſo, Galen's ſix books, de Locis Affectis, et de Morborum Cauſis et Differentiis, and the Prognoſtics of Hippocrates. He died in 1531. His ſon Nicholas ſucceeded him as regent of the Univerſity of Paris, but giving into the errors, his biographer ſays, of Calviniſm, he was obliged to leave Paris, and to paſs the latter part of his life at Bale. Haller Bib. Med. Eloy. Dict. Hiſt.

COPÆ, in *Ancient Geography*, town of Greece, in Bœotia, ſituated on the north banks of the lake Copais, to which it gave name. It is mentioned by Strabo, Ptolemy, and Pliny; the latter of whom ſays, that cars were invented in this place. It had temples of Ceres, Bacchus, and Serapis.

COPAIBA BALSAM, in the *Materia Medica*. See BALSAM.

COPAIFERA, in *Botany*, (from Copaiva, the Indian name, and *fero*, to bear.) Linn. Gen. 542. Schreb. 757. Willd. 880. Juſſ. 365. Vent. 3. 430. Copaiba; Marg. Piſ. Ray. Copaiva; Jacq. Copaier; Encyc. Claſs and order, *decandria monogynia*. Nat. Ord. Undetermined by Linnæus. *Leguminoſæ*; Juſſieu, with a doubt whether it be not more nearly allied to his next order, *Terebintaceæ*.

Gen. Ch. *Cal.* none. *Cor.* Petals four, oblong, acute, concave, widely ſpreading. (Calyx with four diviſions. Corolla none; or petals numerous, caducous? Juſſ.) *Stam.* Filaments ten, filiform, incurved, a little longer than the corolla; anthers oblong, incumbent. *Piſt.* Germ ſuperior, rounded, compreſſed-flattiſh, pedicelled; ſtyle filiform, curved, the length of the ſtamens: ſtigma obtuſe. *Peric.* Legume egg-ſhaped, pointed with part of the ſtyle, two-valved. *Seed* ſingle, egg-ſhaped, involved in a berried aril; (Incloſed in a pulpy envelope; Lam.)

Eſſ. Ch. Calyx none. Petals four. Legume egg-ſhaped. Seed ſingle, in a berried aril.

Sp. C. *officinalis*. Balſam of capevi tree. Linn. Sp. Pl. Jacq. Amer. 133. tab. 86. Pict. 67. 123. Lam. Ill. 342. Woodv. Med. Bot. tab. 137. A lofty tree with a handſome head; the ſmaller branches zig-zag, with a nearly ſmooth, browniſh aſh-coloured bark. *Leaves* alternate, winged, about four inches long; leaflets ſix or eight, peticled, lanceolate-egg-ſhaped, quite entire, ending in a blunt point narrower on one ſide than on the other, ſhining, ſomewhat coriaceous, not exactly oppoſite, one of the uppermoſt frequently wanting. *Flowers* white, on ſhort peduncles; in ſolitary axillary panicles at the ſummit of the branches, which conſiſt of about eight alternate, ſpreading racemes. A native of Brazil, Guiana, and New Spain, frequent about Tolu, ſixty leagues from Carthagena, growing promiſcuouſly among the trees which yield balſam of Tolu, Peru, &c. By a deep inciſion through the bark into the wood of the tree, a fluid balſam or reſin is obtained, which gradually thickens when expoſed to the air. For its chemical and medical properties, ſee the article *Copaiba* BALSAM.

COPAIS, in *Ancient Geography*. a lake of Bœotia; Strabo ſays that it had different names from the towns that were ſituated near it; thus it was called Copais, from Copæ; Haliartos, from Haliarte. It is alſo called Leuconis by Steph. Byz.; and Cephiſſis by Pauſanias. Its preſent name is "Lagordi Topoglia." This lake was 380 ſtadia, or 14⅓ leagues in circumference, and ſerved as a common receptacle for the rivers which iſſued from the mountains by which Bœotia was ſurrounded. As this lake had no apparent outlet, it muſt have overflown the country, if nature, or rather the induſtry of man, had not contrived ſecret paſſages for draining off the water. In the part adjoining to the ſea, the lake terminates in three bays, which advance to the foot of mount Ptous, ſituated between the ſea and the lake. From the bottom of each of theſe bays, diverge a number of canals, that traverſe the mountain through its whole breadth, ſome of which are thirty ſtadia, or more than a league in length, and others of a much greater extent. To excavate or cleanſe them, wells had been ſunk at ſtated diſtances on the mountain, which are of a very great depth. The formation of theſe wells muſt be traced to the moſt remote antiquity, as no traditional or hiſtorical account of their origin exiſts. It requires great labour and expence to maintain them; and as moſt of them have been choaked up, the lake has proportionally gained on the plain.

It is not improbable that the deluge, or rather the inundation which happened in Bœotia, in the time of Ogyges, was cauſed merely by the obſtruction of the water in theſe ſubterraneous conduits.

COPAL. This valuable and ſingular kind of reſin is imported partly from South America, and partly from the Eaſt Indies, and like moſt of the other reſins, is a natural exſudation from a large tree, which hardens in the air.

The beſt copal is a hard brittle reſin, in rounded lumps of moderate ſize, eaſily reducible to fine powder, beautifully tranſparent, but often, like amber, containing parts of inſects and other ſmall extraneous bodies impacted in its ſubſtance.

The colour of copal is a light lemon yellow, varying to orange; but when diſſolved and thinly ſpread over any ſurface, the colour is ſcarcely perceptible, and it only gives a fine hard, ſmooth, tranſparent glazing. It is this union of hardneſs and tranſparency, with want of colour, that renders copal ſo valuable as a varniſh.

Copal unqueſtionably belongs to the claſs of reſins, but it differs from moſt of theſe ſubſtances in the great difficulty with which it diſſolves in alcohol and eſſential oils, ſo as to require great purity of theſe menſtrua and particular management.

The three menſtrua uſually employed in varniſhing, are alcohol, oil of turpentine, or any other eſſential oil, and drying

drying linſeed, or other fixed oil. Theſe are uſed ſometimes ſeparately with the varniſh reſins, but generally mixed.

We ſhall give ſome of the proceſſes by which copal may be diſſolved in each of theſe ſubſtances.

Alcohol ſingly, which ſo readily diſſolves the other reſins, has but little action on copal; for if this reſin in fine powder be digeſted with the very pureſt alcohol, with or without heat, ſcarcely any of it is diſſolved, and the copal coaleſces at the bottom of the veſſel into a tough coheſive maſs. But a ſolution may be effected by the addition of *camphor*, the action of which, upon the reſins, has been partly deſcribed under that article. With none is it more ſtriking than with copal. When the two are ſeparately powdered and mixed, the copal abſorbs the camphor, ſwells and ſoftens into a paſty maſs, which will remain for months of the ſame conſiſtence, without hardening. To make an alcoholic ſolution of copal, diſſolve half an ounce of camphor in a pint of highly rectified alcohol; put it in a glaſs veſſel over a lamp, and add four ounces of copal in ſmall pieces, and continue the heat juſt to that degree at which the bubbles may be counted, till the ſolution is compleat. Part of the copal ſeparates when cold, but moſt of it remains in permanent ſolution.

It is neceſſary firſt to diſſolve the camphor in the alcohol; for, if the paſty maſs ariſing from the mixture of copal and camphor be added to alcohol, the ſolution will not go on.

A mixture of maſtich, elemi, and other reſins, will bear a moderate quantity of copal, without being rendered inſoluble in alcohol, even without the aſſiſtance of camphor.

To diſſolve copal in the eſſential oils, Mr. Sheldrake has given the following proceſs in the Tranſactions of the Society of Arts.

Reduce two ounces of copal to *coarſe* powder; put it into a glaſs veſſel, and pour thereon a pint of the *very beſt* oil of turpentine, with one eighth of ſpirit of ſal ammoniac, previouſly well ſhaken. Cork the glaſs, leaving a pin-hole through the cork to allow of the eſcape of vapour, and ſpeedily heat it to that point at which the bubbles may be counted. Continue this till the ſolution is complete, taking care not to increaſe the heat, otherwiſe the copal will coaleſce at the bottom of the glaſs, and the ſolution will not go on. The veſſel ſhould not be opened till quite cold. This liquor is of a rich deep yellow when in quantity, but when applied as a varniſh, it is nearly colourleſs. The ſpirit of ſal ammoniac is not a neceſſary ingredient.

Mr. Tingry of Geneva (Painter's and Varniſher's Guide, 1804,) finds that copal may be united to oil of turpentine by the intermede of ſome other of the eſſential oils, particularly oil of ſpike and lavender. He gives the following proceſs: Take two ounces of oil of lavender, heat it in a glaſs matraſs, add thereto an ounce of copal groſsly powdered, and, at different times, ſtirring the mixture with a ſtick of white wood. When the copal is diſſolved, add ſix ounces of oil of turpentine, nearly boiling, and ſtir the whole thoroughly. This gives a fine gold-coloured liquid, very fit for varniſhing.

Camphor alſo highly aſſiſts the ſolution of copal, in oil of turpentine, as it does in alcohol, and the ſame precaution is neceſſary, of diſſolving the camphor completely in the oil, before the copal is added. Half an ounce of camphor is ſufficient to a quart of the oil, to enable it to take up as much copal as will make a good varniſh.

To unite any of the reſins with drying linſeed oil in the compoſition of the oil varniſhes, it is neceſſary to expoſe them to a much greater heat than in the former inſtances, that is, not leſs than is ſufficient to liquefy the reſins. This, however, always gives the reſin a certain degree of brown colour, which is often injurious to it when uſed as a varniſh. Copal when melted with as little heat as poſſible, and then dropped into drying linſeed oil, diſſolves therein with eaſe, and this ſolution mixed with clear turpentine, forms a very fine hard varniſh. To avoid as much as poſſible the diſcolouration of the copal, Mr. Tingry incloſes it in a kind of wire-cage ſuſpended in a very ſlow well-regulated furnace; and, as ſoon as any portion melts, it falls in drops into the drying oil heated and ſet beneath it.

When melted copal is dropped into water, a ſmall quantity of oil is ſeparated, and floats at top, and the reſin at the bottom is thereby rendered ſomewhat more ſoluble in the different menſtrua.

Copal is liable to be confounded with gum anime, when the latter is very clear and good. The diſtinction is of ſome conſequence, as the anime, though valuable in varniſhing, is much leſs ſo than the fineſt copal, the varniſh with the former being darker coloured, and not ſo hard. Beſides the external appearance of each, which is pretty diſtinct to a practiſed eye, the ſolubility in alcohol furniſhes an uſeful teſt, the anime being readily ſoluble in this fluid, but the copal ſcarcely ſo.

COPALLI, in *Botany*, Hernand. See RHUS *copallinum*.

COPAR, in *Ancient Geography*, a village of Arabia Felix, according to Ptolemy.—Alſo, a place of Paleſtine, in the vicinity of Cæſarea Philippi.

COPARCENARY, the ſhare, or quota, of a coparcener.

COPARCENERS, from *con*, and *particeps*, *partner*; or parceners; ſuch as have equal portions in the inheritance of their anceſtor.

Coparceners are ſo either by *law*, or *cuſtom*. Coparceners *by common law*, are the iſſue female; which, in default of a male heir, come equally to the lands of their anceſtor: thus, when a perſon ſeiſed in fee-ſimple or in fee-tail dies, and his next heirs are two or more females, his daughters, ſiſters, aunts, couſins, or their repreſentatives; in this caſe they ſhall all inherit, and theſe co-heirs are then called coparceners or parceners.

Coparceners *by cuſtom*, are thoſe who, by ſome peculiar cuſtom of the country, challenge equal parts in ſuch lands; as in Kent, by the cuſtom of gavelkind, according to which lands deſcend to all the males in equal degree, as ſons, brothers, uncles, &c. In either of theſe caſes, all the parceners put together make but one heir, and have but one eſtate among them. Co. Litt. § 241, 242, 265; and 163. The crown of England is not ſubject to coparcenary.

COPARTNERSHIP. See PARTNERSHIP.

COPAS, in *Ancient Geography*, a river of Aſia Minor, in Caria.

COPATZ, in *Geography*, a town in the iſland of Cherſo; 8 miles N. of Cherſo.

COPE, an eccleſiaſtical ornament, uſually worn by chantors and ſub-chantors, when they officiate in the church-ſolemnity. It is alſo worn by the Romiſh biſhops, and other ordinaries: it reaches from the ſhoulders to the feet. The ancients called it *pluviale*.

In the trial of archbiſhop Laud, one of the charges alleged againſt him was his introducing the uſe of copes and church muſic into divine worſhip. To this charge he replied,

plied, that the uſe of copes is preſcribed by the 24th canon of 1603, which ſays, "that in all cathedrals and collegiate churches, the communion ſhall be adminiſtered on principal feaſt-days, ſometimes by the biſhop, if preſent, ſometimes by the dean, and ſometimes by the canon or prebendary, the principal miniſter uſing a decent cope;" ſo that in this reſpect he had made no innovation.

To this defence it was replied, that neither the common-prayer book, nor book of ordination, nor homilies confirmed by parliament, nor queen Elizabeth's injunctions in her firſt year, make any mention of copes, though they are evidently derived from the popiſh wardrobe; and the laſt common-prayer book of king Edward VI. expreſsly prohibits them. The 24th canon of 1603 enjoins only the chief miniſter to wear a cope at the adminiſtration of the ſacrament, whereas the archbiſhop preſcribed them to be worn by others beſides the chief miniſter, and as well when the ſacrament was not adminiſtered as when it was. But theſe canons not being confirmed in parliament, expired with king James, and therefore could be no warrant for their preſent uſe.

Cope, in *Biography*, a Flemiſh ſculptor of the 16th century, who reſided at Rome, and is celebrated by Baglione for the beautiful baſſo-relievos which he modelled, in a ſmall ſize, from the Fables of Ovid; and which were afterwards caſt in gold and ſilver, for the purpoſe of ornamenting the magnificent furniture of thoſe times. The above-mentioned author informs us, that impreſſions from theſe beautiful models were generally diſperſed and much admired at Rome. From Baglione's deſcription of theſe works, we might be led to conjecture, that many of thoſe ſmall baſſo-relievos in bronze, which are uſually attributed to Benvento Cellini, are no other than caſts from theſe models of Cope. He is ſaid to have ſucceeded in ſome ſmall productions in ivory; and, ultimately, to have attempted a ſtatue of a larger ſize in marble, which, however, after a long and fruitleſs labour, he left unfiniſhed. He was not leſs remarkable for his talents, than for his moroſe and unſocial diſpoſition, and he died miſerably at about the age of 80, in the pontificate of Paul V. Baglione.

Cope, *St. Martin's*, was a relic formerly in great eſteem among the French kings; and was often carried with them to war as their ſtandard.

Cope, among *Miners*, is a cuſtom or tribute due to the king, or lord of the ſoil, out of the lead mines in ſome part of Derbyſhire. This duty amounted, according to Manlove, to ſixpence a load, nine diſhes making one load.

COPEC, in *Commerce*, a Muſcovite coin, valued at about a half-penny; ſo that 100 copecs are equal to a ruble, which is valued at an average at 4*s*.

COPE-STAKE, a German coin, valued at 12*d*. ſterling.

COPENHAGEN (in Latin *Hafnia*, in Daniſh *Kiobenhavn*, originally *Kiobmandſhavn*, the *Merchants' harbour*), in *Geography*, is the capital of the kingdom of Denmark, ſituated on the eaſtern ſhore of the iſland of Zealand, in a bay of the Baltic ſea, about 24 Engliſh miles from the Sound. E. long. 12° 35′ 15″. N. lat. 55° 41′ 4″, 160 miles N.E. of Hamburgh, and 240 S.W. of Stockholm. Its circumference is from 4 to 5 Engliſh miles.

In the 11th century Copenhagen was only a mean fiſhing place. It owed its increaſe to a caſtle, which protected its inhabitants againſt the numerous pirates who infeſted the Baltic ſea. Leyre, or Lethra, of which ſome remains have been found near Roſchild, had been the reſidence of the Daniſh kings till the year 950, when that diſtinction was beſtowed on Roſchild itſelf, from whence the ſeat of empire was transferred to Copenhagen, in 1443, during the reign of Chriſtopher of Bavaria. From that time the kings of Denmark have conſtantly reſided at Copenhagen.

This city was always well fortified by nature and art, but the ſtrong citadel of Frederickſhavn, between the harbour and the eaſt gate, was only erected in 1663, previous to which time Copenhagen had often been attacked. In the year 1523 it was beſieged by Frederick, duke of Gottorp, ſupported by a fleet from Lubeck, conſiſting of ten ſhips of war. Preſſed by famine, and cut off from all hopes of relief, the citizens ſurrendered, after a cloſe ſiege of ſeven months. Thirteen years after, when, on the death of Frederick, the inhabitants attempted to replace their old and favourite king Chriſtian II. on the throne, Copenhagen underwent the ſame fate.

In 1658, Charles Guſtavus, king of Sweden, having led his army over the ice, overran Denmark, and in the month of Auguſt appeared before Copenhagen, whilſt his fleet blockaded the harbour. Bombs and red-hot balls were thrown into the city, but the fire was immediately extinguiſhed by the activity of the inhabitants. However, in the month of October of the ſame year the Dutch fleet, under the command of admiral Opdam, came to the aſſiſtance of the beſieged, defeated the Swediſh fleet, and threw a large ſupply of proviſions into the town. Charles Guſtavus at length ventured a general aſſault in the night between the 11th and 12th of February 1659, when the ditches about the ramparts were thickly frozen. The chief attack was directed againſt the weſtern rampart which the citizens and ſtudents defended with ſuch obſtinacy, that the Swediſh monarch, giving up all hopes of taking the city, retired, and the year following concluded a peace. As a reward for their bravery, the citizens and ſtudents obtained privileges which they enjoy at this day.

During the reign of Frederick IV. in the year 1700, Copenhagen was again beſieged on the land ſide by a Swediſh army under the command of the renowned Charles XII. and on the ſea ſide by the combined fleets of Holland, England, and Sweden. The Daniſh king was in Holſtein, but the queen dowager, Charlotte Amelia, having animated the citizens and ſtudents to a brave reſiſtance, neither the numerous Swediſh army, nor the combined fleets, could make any impreſſion on the town. The peace of Travendahl put an end to the ſiege, and Copenhagen enjoyed a complete century of uninterrupted peace.

On the 2d of April, 1801, the Engliſh vice-admiral, Nelſon, with 11 ſhips of the line, 7 frigates, and 19 ſmall veſſels, attacked the line of defence before the port of Copenhagen, and, after a moſt obſtinate engagement of three hours and a half, unfurled the white flag, took poſſeſſion of 11 Daniſh ſhips, and, by an equally well-timed and ſkilful negociation, detached Denmark from the maritime league into which ſhe had entered with Ruſſia and Sweden againſt England. The harmony between the two countries was reſtored, but continued only until the month of Auguſt 1807, when a ſtrong Engliſh fleet encircled the iſland of Zealand, having previouſly diſembarked an army of nearly 20,000 men, under the command of lord Cathcart, which inveſted Copenhagen by land. After a vigorous bombardment of five days and nights, during which Copenhagen made a defence worthy of the acknowledged bravery of the Danes, and the citizens and ſtudents diſplayed the moſt undaunted courage, a capitulation was agreed upon on the 7th of September, by which the Engliſh troops were allowed to take poſſeſſion of the citadel for ſix weeks, and the whole Daniſh navy, conſiſting of 18 ſail of the line, 15 frigates, 6 ſloops, and 25 gun-boats, together with all the ſtores of the naval arſenal of Chriſtianſholm, were ſurrendered to the diſpoſal of the king of Great Britain.

On this occaſion Copenhagen ſuffered ſeverely. In the night of the 4th of September the grand ſteeple of St. Mary's, or our lady's church, which was 380 feet high, and ſtood on the higheſt ſpot in the city, was ſet on fire, and after having blazed for four hours, fell with a moſt tremendous craſh. From ſix to ſeven hundred buildings, beſides thoſe of the univerſity and one hoſpital, were burnt to the ground; thouſands were damaged, and no more than four hundred houſes eſcaped unhurt. Several valuable libraries fell a prey to the flames, and five or ſix hundred peaceable inhabitants were killed or maimed.

Anciently, Copenhagen had often been viſited by the plague. The laſt which raged, in 1711, ſwept away great numbers of the inhabitants. In more recent times, Copenhagen has been frequently expoſed to terrible conflagrations. On the evening of the 20th of October 1728, a fire broke out in a low houſe, not far from the weſt-gate, which ſpread with ſuch fury, that in eight-and-forty hours the moſt elegant part of the city was laid in aſhes; 1650 dwelling houſes, four churches, the univerſity buildings, and ſeveral other public edifices were burnt down to the ground. On the 26th of February 1794, the church of St. Nicholas, and the royal palace of Chriſtianſburg, the gorgeous magnificence of which is ſufficiently atteſted by its ſtupendous remains, were deſtroyed by fire, and hardly had the private houſes, which ſuffered in this dreadful calamity, been rebuilt, when another conſiderable part of the city was reduced to aſhes in 1795.

Theſe conflagrations contributed, however, to render Copenhagen one of the fineſt cities in the north. The houſes, though moſtly of brick ſtuccoed, exhibit a beautiful and uniform appearance, the ſtreets are furniſhed with lamps; well paved, with a foot way on each ſide, and running in a ſtraight line; but ſome of the ſtreets are rather too narrow.

Copenhagen is divided into the Old and New Town and Chriſtianſhafen. The *Kongens nye Torge*, or king's New Market, which connects the Old with the New Town, is a ſpacious, irregular area, embelliſhed with an equeſtrian ſtatue in bronze of Chriſtian V., and adorned with ſeveral handſome buildings, among which are the palace of Charlottenburg, devoted in part to the Royal Academy of painting, architecture, and ſculpture; and the theatre, which, though ſmall, is neat and elegantly decorated within. In the New Town is a beautiful octagon, containing four uniform and elegant buildings, in two of which the royal family reſided ever ſince the palace was burnt down. In the middle of the octagon ſtands an equeſtrian ſtatue of Frederick V. in bronze.

Chriſtianſhafen is built on the iſland of Amack, and connected with the Old Town by two bridges. Beſides the fine dock-yards, where the men of war are refitted, Chriſtianſhafen contains the great Weſt India ſugar houſe and the Eaſt India houſe. The iſland of *Amack* itſelf is conſidered as the kitchen garden of Copenhagen, and furniſhes the ſame with greens, fruit, milk, butter, and cheeſe in abundance. It is 9 miles long and about 2½ miles in breadth. It contains above 800 families or 4000 ſouls, and is divided into two pariſhes, Taarnebye which is inhabited by Danes and Dutchmen, and Hollanderbye inhabited only by the deſcendants of a Dutch colony, which king Chriſtian II. tranſplanted hither from North Holland, in 1516, at the requeſt of his wife Elizabeth, ſiſter to Charles V. who was a native of the Low Countries. The language of the inhabitants of Amack is ſtill a mixture of Daniſh and Low Dutch. They have preſerved their particular dreſs, manners, and cuſtoms. The men wear broad brimmed hats, black jackets, full glazed black breeches, looſe at the knee; the women black jackets, red petticoats, and a piece of blue glazed cloth bound round their heads. There is a particular market place at Copenhagen for the peaſants of Amack, called the Amacker market.

The harbour of Copenhagen, formed by the ſtraits of Kelleboe, between the iſlands of Zealand and Amack, is capable of holding 500 ſhips. It is protected by ſeveral batteries, of which that of the three crowns is the moſt formidable. The naval arſenal, called Chriſtianſholm, is much ſuperior to that of Venice. The forges, workſhops, rope-walks, are upon an admirable conſtruction. Each ſhip has her ſeparate magazine, containing all the materials for her equipment. The ſeamen are regiſtered and divided into two claſſes; thoſe who in time of peace are permitted to ſerve on board the merchants' ſhips, or to enter into foreign ſervice, ſubject to be recalled in caſe of war, and the ſtationary ſailors who are always in the employ of the crown. The latter, 4000 in number, live in barracks at Copenhagen. The academy of marine cadets forms one of the palaces in the octagon of the New Town. It was founded in 1701, for the education of fifty young gentlemen, who are boarded and inſtructed gratis; but more are admitted, on paying, to ſhare in their inſtruction. They have to paſs through ſeveral ſevere examinations before they are entered as midſhipmen in the king's ſhips.

Copenhagen is the chief commercial town of all Denmark. Its principal domeſtic trade is with Norway, Iceland, the Faro iſlands, and Greenland. Since the year 1754, the trade to the Weſt Indies is free to all the Daniſh ports; yet Copenhagen receives, almoſt excluſively, the return cargoes from St. Croix, St. Thomas, and St. John. Copenhagen is alſo the ſeat of an Eaſt India Company, a Jiro Bank, an Inſurance Company; and its extenſive foreign trade is chiefly with Germany, the countries round the Baltic, and the Mediterranean ſeas, France, Portugal, and Spain. In the year 1792, Copenhagen had only 218 ſhips of about 24,000 tons, but during the long wars between France and England their number has been nearly doubled.

The moſt important manufactures of Copenhagen are the woollen cloth and ſtuff, the calico-printing, ſilk, and China manufacture. The latter, though in its infancy, is thought to rival thoſe of Dreſden and Berlin.

Copenhagen is the ſeat of an univerſity founded in 1475. It is richly endowed, grants a ſupport of 4 marks Daniſh, or nearly 3 ſhillings Engliſh, a week to 180 poor ſtudents, and ſince the year 1791 diſtributes eight premiums annually for the beſt anſwer to eight prize queſtions. There are four colleges, in which 168 ſtudents are provided with lodging, fire wood, and pecuniary ſtipends. The number of ſtudents is generally between five and ſix hundred.

Since the year 1742, ſeveral learned aſſociations have been formed at Copenhagen, the oldeſt and moſt known of which is the Royal Society, whoſe reſearches have thrown great light on northern hiſtory. This ſociety ſuperintends alſo the geographical menſuration of the country, and the publication of new ſpecial maps. It propoſes four queſtions annually, and the prize for each is a gold medal worth twenty pounds ſterling. But beſides the Medical Society, founded in 1772, that of Icelandic literature, founded in

1779, and that of natural hiſtory, founded in 1789, the moſt important is the Royal Economical Society, founded in 1768, whoſe annual income of 6000 dollars, or 1200*l.* ſterling, is expended in promoting the fine arts, fiſheries, agriculture, and horticulture, and in encouraging every attempt that tends to benefit the country. It is now endeavouring to eſtabliſh a regular importation of coals from the Faro iſlands. There is alſo a board of longitude and a repoſitory for marine charts, founded in 1784, which has publiſhed excellent charts of the entrance of the Sound, of the two Belts, the Sound and the Baltic as far as Bornholm, of the Cattegat, of part of the weſtern coaſt of Iceland, of part of the eaſtern coaſt of Iceland, of the Faro iſlands, and ſix charts of the coaſt of Norway. Copenhagen has likewiſe acquired ſome celebrity from its royal muſeum or cabinet of curioſities remarkable for Laplandiſh dreſſes, implements, and arms; from its excellent theatre of anatomy, founded in 1736, and from its public royal library, which, in 1797, was increaſed with the celebrated Suhm's library of 50,000 volumes, collected by himſelf, and relating chiefly to the antiquities of northern Europe.

There is only one theatre at Copenhagen, which is partly ſupported by the court. During the year 1806, it brought out nine tranſlated pieces, and only one original Daniſh comedy. The performances of the ſeaſon amounted to 158. There has been no Italian opera of late; only occaſionally, and for a ſhort time, German and French plays are performed by itinerant companies.

Copenhagen is the ſeat of a ſupreme tribunal, which is the higheſt court of juſtice for all the Daniſh dominions. Its ſittings are opened with great ſolemnity in the beginning of March, on the ancient *Herredag* or *Danehoev* (meeting of parliament) by the king himſelf. And beſides the inferior courts of juſtice there are *boards of conciliation*, or rather *conciliatory committees*, whoſe duty it is to accommodate matters between the parties by all poſſible means of perſuaſion. If an accommodation takes place, the expences are very trifling, and the parties are bound to abide by it. From the 13th of Auguſt, 1795, when the firſt conciliatory committee was eſtabliſhed at Copenhagen till the 31ſt of December 1801, 13,223 litigations were prevented at Copenhagen only in the courſe of ſix years and a half.

The biſhop of Zealand, who is firſt in rank among the twelve biſhops, of whom the Daniſh hierarchy is compoſed, reſides at Copenhagen, which, beſides the cathedral, counts 20 churches, one French proteſtant church, and ſeveral ſynagogues for the Jews, whoſe number amounts to 1500. They are moſt liberally treated at Copenhagen, and there is even a ſociety eſtabliſhed by Chriſtians for the purpoſe of encouraging the inſtruction of Jews in arts and handicraft-trades.

In 1714, Frederick IV. eſtabliſhed at Copenhagen a board of miſſions or *Collegium de Curſu evangelii promovendo*, which ſends miſſionaries to Greenland, and to the Eaſt Indies. The latter are alſo ſupported in part by contributions collected at London. In the beginning of 1807, Copenhagen, with its ſuburbs, counted 3156 houſes, and 104,000 inhabitants. The regiſters for the year 1806, gave 3440 born, 3109 dead, and 930 couples married. In 1799, Copenhagen counted only 82,608 inhabitants, one-ſixteenth, or 5163, of whom were paupers. Yet no beggars are ſeen in the ſtreets. A board of alms watches over the poor, who are provided for by voluntary contributions. Copenhagen has twenty-two hoſpitals, and thirty poor-houſes. In 1802, the principal infirmary admitted 2349 patients, 1813 of whom were cured, 218 died, and 318 remained in the houſe. The naval hoſpital, or *Quatſch-houſe*, contains 300 invalid ſailors.

The police at Copenhagen is vigilant and good. A paper publiſhed weekly, under the title of the *Friend of the Police*, has particularly contributed to render the police excellent, by pointing out the moſt minute objects with regard to which it was thought deficient. Since the year 1804, the priſons have been rendered much more comfortable. They are all wainſcotted and boarded, provided with bedſteads, blankets, and mattreſſes; and no perſon, whatever may be his crime, is ever confined in a dungeon or cellar. In the Raſp-houſe, where capital offenders are ſhut up for life, the male convicts raſp and ſaw Brazil wood, the females ſpin, and thus they all contribute towards their ſupport by their labour. There is alſo a board of health, and a committee for promoting vaccination, under whoſe ſuperintendance 6489 individuals were inoculated for the cow-pox at Copenhagen, in the courſe of the year 1802.

Copenhagen is ſurrounded with country ſeats, which offer the moſt enchanting ſea-views. Its environs are beautiful, the country being finely varied with ſmall foreſts of beech and oak. Of the ſummer-palaces in its neighbourhood, *Frederickſberg* is the moſt remarkable for its delightful ſituation.

Without the weſtern gate, cloſe to Copenhagen on the high road, ſtands an intereſting monument in commemoration of the emancipation of the peaſants, which was effected under the preſent king. Four figures of white marble, repreſenting peace, plenty, content, and induſtry, occupy the four corners of a pedeſtal, from the centre of which riſes a pyramid. On one ſide of the baſe are theſe words: "For Chriſtian den ſyvende de Danſkes og Norges Konge af eenige og taknemmelige Borgere." To Chriſtian the Seventh king of the Danes and Norwegians from united and grateful citizens; and on the other, "Grund ſteenen blev lagt af Frederik kongens ſon, folkets ven 1792." The foundation ſtone was laid by Frederic the king's ſon, the friend of the people.

A. Anderſon's Tour in Zealand, in the year 1802. Buſching. I. 85. Coxe's Travels, fifth edition, vol. v. p. 97. Catteau's Tableau du Danemarck. Sir John Carr's Northern Summer, p. 42. Fr. Thaarup's Statiſtik der Dæniſchen Monarchie. 1796.

COPERARIO, Giovanni, or John Cooper, in *Biography*, an Engliſh muſician, who, having reſided for ſome time in Italy, on returning to his native country, Italianized his name, and became a favourite performer on the lute and viol du gambe, and a voluminous compoſer of *fantaſie*, fancies, for viols, in three, four, five, and ſix parts. He was appointed muſic-maſter to the children of James I.; and prince Charles, under his inſtruction, made a conſiderable progreſs on the viol. Some of his vocal compoſitions were printed in the muſical publications of the times. In conjunction with Nicholas Laniere, and others, he compoſed the ſongs in a Maſque, written by ſir Thomas Campion, on the marriage of Carr, earl of Somerſet, and lady Frances Howard, the divorced counteſs of Eſſex, which was performed in the Banquetting Room at Whitehall, on St. Stephen's night, in the year 1604. Mr. Fenton, in his notes on Waller, ſays, that Henry Lawes, having been educated under him (Coperario), "introduced a ſofter mixture of Italian airs than had before been practiſed in this country;" from which, and from his giving him the title of *Signor*, he ſeems to intimate, that he regarded him as an Italian. The following are the titles of his printed works, excluſive of the ſongs which he compoſed in conjunction with Laniere: "Funeral Tears for the Death of the Right Hon. the Earl of Devonſhire, figured in ſeauen Songes, whereof ſixe are ſo ſet forth that the Wordes may be expreſſed by a treble Voyce alone to the Lute, and baſe Viol, or elſe that the meane part may be added, if any ſhall effect more fulneſſe of parts. The ſeaventh is made in forme of a Dialogue, and cannot be ſung without two Voyces. Invented by John Coperario." Fol. London, 1606. 2. "Songs of Mourning, bewailing the untimely death of Prince Henry, worded by Thomas Campion, and ſet forth to bee ſung with one Uoice to the Lute or Violl, by John Coperario." Fol. Lond. 1613.

COPERNICAN Sphere. See Sphere.

Copernican *Syſtem*, is that ſyſtem of the world, wherein the ſun is ſuppoſed at reſt in the centre; and the planets, with the earth, to move in ellipſes round him.

The heavens and ſtars are here ſuppoſed at reſt; and that diurnal motion which they appear to have from eaſt to weſt, is imputed to the earth's motion from weſt to eaſt.

This ſyſtem was aſſerted by many of the ancients; and particularly Ecphantus, Seleucus, Ariſtarchus, Philolaus, Cleanthes Samius, Nicetas, Heraclides Ponticus, Plato, and Pythagoras; from the laſt of whom it was anciently denominated the *Pythagoric ſyſtem*.

It was alſo held by Archimedes, in his book De Granorum Arenæ Numero; but after him it became neglected, and even forgotten, for many ages; till above three hundred years ago, when Copernicus revived it; from whom it took the new name of the *Copernican ſyſtem*. See Copernicus.

COPERNICUS, Nicholas, or rather Copernick, in *Biography*, the celebrated aſtronomer, was born at Thorn in Pruſſia, near the Old Gate, on the 19th of February, 1473, [illegible] which was ſtill extant in 1797, and ſhewn to ſtrangers as one of the greateſt curioſities of that town. His father was a ſurgeon; his mother's brother, *Lucas Walzelrodt*, or, as he is ſometimes called, *Waiſſelrodt Von Alten*, was, ſome years after young Copernicus's birth, raiſed to the dignity of biſhop of Ermeland, in Latin, Epiſcopus Varmienſis: which circumſtance has betrayed moſt of the Engliſh biographers into a ſingular miſtake. They make Copernicus canon of Worms, in the ſouth of Germany, inſtead of Frauenburg in Pruſſia, which is the ſee of the biſhops of Ermeland.

Copernicus received his firſt inſtructions in the grammar ſchool of his native city, from whence he was ſent to ſtudy phyſic at the univerſity of Cracow, where he gained the academical honour of a doctor's diploma. But he never practiſed as a phyſician, though he readily gave his advice, and his medicines, without any fee, to thoſe friends who conſulted him. Mathematics were his favourite ſtudy: and he took particular delight in the ſtudy of perſpective; and this induced him to acquire the art of painting, in which he is ſaid to have excelled. From the inſtant he had heard Albert Brudzevius's mathematical lectures at Cracow, he was fired with the noble ardour of emulating the two greateſt mathematicians of his time, George Purbach, an Auſtrian, and John Regiomontanus, a native of Königſberg, in the Newmark of Brandenburg. To accompliſh this arduous deſign, he went to Italy, and was at firſt the pupil, but ſoon became the friend and aſſiſtant, of Dominicus Maria, of Ferrara, who was then teaching mathematics at Bologna, and whoſe hypotheſis about the variability of the axis of the globe, by exciting univerſal attention, gave Copernicus the firſt ideas of the motion of the earth. At Bologna, in the year 1497, Copernicus firſt obſerved the occultation of Palilitium by the moon.

He left Bologna to teach mathematics at Rome, where he obſerved an eclipſe of the moon in the year 1500; and ſuch was his dawning celebrity, that, even after his return to Pruſſia, he was conſulted by the clergy of Rome, in the year 1516, reſpecting the improvement of the calendar. In the mean time his uncle, the biſhop of Ermeland, had made him a canon of the chapter of Frauenburg; and the town of Thorn had named him to the archdeaconry of the church of St. John: yet he ſeldom lived in his native city, but made Frauenburg his principal reſidence. Zealouſly attached to the tenets of his church, he fulfilled the duties of his clerical offices with punctual care. The glorious Reformation, which he witneſſed, had no influence on his religious opinions: his mind purſued a different tract. Drawing and painting, the ſtudy of perſpective, and the making of mathematical inſtruments, filled his leiſure hours; and beſides his regular avocations, the conſtruction of ſome aqueducts abſorbed his time. That which feeds the mill of Graudentz with water has been completely preſerved; of another, which ſupplied the hill of Frauenburg, on which the canons reſide, nothing remains but the tower on the banks of the Paſſarge, to the top of which he raiſed the waters of that river, and which exhibits ſtill the following inſcription:

> "Hic patiuntur aquæ ſurſum properare coactæ,
> Ne careat ſitiens Incola montis ope,
> Quod natura negat tribuit Copernicus arte,
> Unum pro cunctis Fama loquatur opus."

Whenever the biſhop was abſent, Copernicus was entruſted with the government of the dioceſe; and after the death of two prelates, he was appointed general vicar during the vacancy. He was alſo frequently deputed to the provincial diets. Nothing, however, could divert him from his original purpoſe. He applied his ſtores of mathematical knowledge to the improvement of aſtronomy. The garret of his houſe at Frauenburg, which is ſtill ſhewn, and the ſteeple of the cathedral, were his obſervatories. The epicycles and eccentrics of Ptolemy embarraſſed and perplexed him; but the hypotheſis of the earth being the motionleſs centre of the univerſe, was generally received: it had been adopted by Plato and Ariſtotle, whoſe authority was conſidered paramount to that of the bible; and Joſhua's command to the ſun and moon confirmed it. To attack this ſyſtem was incurring the imputation of hereſy; and it required no ordinary courage to advance an opinion, for which Galileo ſuffered a century after.

In this perplexity, Copernicus aſſiduouſly ſearched the lore of antiquity. He found that the Egyptians taught the revolution of Mercury and Venus about the ſun; that Apollonius and Pergæus had aſſigned the ſame motion to Mars, Jupiter, and Saturn; that, according to his diſciples, Nicetas and Heraclides, Pythagoras, whoſe learning was derived from the Egyptians, aſſerted the earth's motion round its own axis; and that Ariſtarchus and Philolaus went ſtill farther, and maintained that the earth did not only move about its axis, but employed twelve months in revolving round the ſun.

On theſe foundations Copernicus raiſed a ſtructure, of which his intenſe and acute ſtudy furniſhed him with the moſt correct mathematical evidence. According to his ſyſtem, the ſun occupies the centre of the univerſe; the planets, in their motion round him, deſcribe ellipſes proportioned to their ſize; Mercury moves round the ſun within three months, Venus within eight, the earth within twelve, and within four-and-twenty hours it revolves round its own axis; the moon is a ſatellite of the earth, about which ſhe turns thirteen times in a year; Mars takes two, Jupiter almoſt twelve, and Saturn nearly thirty, years to move about the ſun.

It was in the year 1530 that Copernicus laid the laſt hand to his ſyſtem, which he had begun to form about the year 1507; but he had not yet ventured to launch it into the learned world, when its fame reached the biſhop of Capoua, cardinal Nicholas Schönberg, who, in 1534, by a letter which does honour to his ſentiments, invited Copernicus to publiſh his new ſyſtem. Other great men, particularly Tindemann Gieſe, biſhop of Culm, aſſailed him with their intreaties to the ſame purpoſe. But his modeſty was ſtill reſiſting their preſſing application, when Rheticus, profeſſor of mathematics at Wittenberg, excited by an ardent thirſt of learning, reſigned his chair, and viſited Copernicus at Frauenburg, in the year 1539. To him Copernicus at laſt truſted his work, which, in 1543, was printed at Marienburg, at the expence of cardinal Schönberg, under the title of "Nicolai Copernici de Revolutionibus Orbium Cœleſtium, Libri vi." But he did not live to read his book in print. A copy of it reached him only a few hours before his death, which happened at Frauenburg, on the 22d of May, 1543, three months and three days after he had entered the ſeventy-firſt year of his age. He was probably buried at the foot of the altar before which he uſed to celebrate maſs; for, 38 years after his death, Cromerus, biſhop of Ermeland, cauſed the following inſcription to be placed on his tomb-ſtone, which is now ſhewn in the chapter's room:

D. O. M.
R. D. Nicolai Copernico Torunenſi,
Artium et Medicinæ Doctori, Canonico Varmienſi,
Præſtanti Aſtrologo et ejus Diſciplinæ inſtauratori,
Martinus Cromerus Epiſcopus Varmienſis,
Honoris et ad Poſteritatem Memoriæ Cauſa poſuit,
MDLXXXI.

Others pretend that Copernicus, having requeſted to be interred near his relations, was buried at Thorn, in the church of St. John, where he is repreſented in his canonical dreſs, kneeling before a crucifix, and a globe on his ſide, with this inſcription:

"Non parem Pauli gratiam requiro,
Veniam Patri neque poſco, ſed quam
In crucis ligno dederas Latroni, ſedulus oro."

Nicolai Copernico Thorunienſi abſolutæ ſubtilitatis mathematico, ne tanti viri, apud exteros celeber, in ſua patria periret memoria hoc monumentum poſitum. Mort. Varmiæ in ſuo Canonicatu, anno 1543, die 4, ætatis LXXIII.

This painting was renovated, in the year 1733, by a poſtmaſter of Thorn, named Rubinkowſki. A print of it may be ſeen in Hartknock's Ancient and Modern Pruſſia.

It is ſuppoſed that Copernicus's manuſcripts were depoſited at Braunſberg, in the Jeſuits' library, with the books of which they may have been removed to Sweden by Charles XI. Whether they be ſtill extant in that country is uncertain. Ludwig von Baczko's Kleine Schriften, 1797, vol. ii. p. 135. Gaſſendi Opera, vol. v. p. 499. Bernoulli's Travels, vol. iii. p. 18.

See the order and diſpoſition of the heavenly bodies, as laid down by him, compared with thoſe in the other ſyſtems, under the head System.

This ſyſtem has been eſtabliſhed by new arguments advanced by Kepler, Galileo, and Newton, in every ſucceeding age; and notwithſtanding the oppoſition it met with, from the prejudices of ſenſe againſt the earth's motion, the authority of Ariſtotle in the ſchools, the threats of ignorant bigots, and the terror of the inquiſition, it has generally prevailed. Galileo, after having demonſtrated the motion of the earth, was obliged, by the rancour of the Jeſuits, to go to Rome, and there ſolemnly renounce it. Beſides which cruel treatment, he was condemned to a year's impriſonment in the inquiſition, and the penance of repeating daily ſome penitential pſalms. As a ſpecimen of the authority of the Romiſh church in oppoſition to this ſyſtem, we ſhall only tranſcribe the declaration of the excellent commentators, Le Seur and Jacquier, on the Principia, prefixed to the third volume. "Newtonus in hoc tertio libro telluris motæ hypotheſim aſſumit. Autoris propoſitiones aliter explicari non poterant, niſi eâdem quoque facta hypotheſi. Hinc alienam coacti ſumus gerere perſonam. Cæterum latis a ſummis pontificibus contra telluris motum decretis nos obſequi profitemur."

Copernicus is the name of an aſtronomical inſtrument, contrived by Mr. Whiſton, for the calculation and exhibition of eclipſes, and of the motions of the planets, both the primary and ſecondary ones, &c.

It was ſo called by the inventor, as being conſtructed on the Copernican ſyſtem; or as repreſenting the heavenly bodies agreeable to it.. It conſiſts of ſeveral concentrical circles of wood; upon which are inſcribed numbers, transferred hither from the aſtronomical tables: by the various diſpoſitions of theſe circles, which are made ſo as to ſlide within each other, queſtions are ſolved; and thus long calculations are ſaved, and the work of many hours brought into a few minutes.

For the exhibition of eclipſes there is a peculiar apparatus, conſiſting of a terreſtrial globe, ſo diſpoſed, as that, being turned round its axis, the light of the ſun, or a candle, is projected through a glaſs plane, marked out into concentric circles, expreſſing digits of the eclipſe: and thus is the path of the eclipſe, with its degree or quantity in any part of its path, agreeably and accurately repreſented.

The inſtrument not being very common, a particular deſcription would be ſuperfluous. The author of it has written a book to explain it.

COPHANTA, in *Ancient Geography*, a port of Carmania.

COPHANTUS, a mountain of Aſia, placed by Pliny in Bactriana.

COPHENES, a river of India, which ran between Alexandria, and the firſt ſcene of the military operations of Alexander, and which, as major Rennell conjectures, occurred pretty early in his march. In Alexander's arrangement of boundaries, the river Cophenes was the eaſtern limit of the province of Paropamiſus, of which Alexandria was regarded as the capital; and that province, according to the ideas of Ptolemy, lay between thoſe which the moderns name Koraſan and Cabul. The major therefore concludes, with ſome degree of confidence, that the river "Cow" of the Turkiſh geography, and the "Cow-mull" of Baber, which paſſes by Nughz, and whoſe principal branches are the rivers of Ghizni and Gurdaiz, is the Cophenes; and that we muſt look for Alexandria in the quarter of Bamian, though it is not poſſible to aſſign its particular ſituation. At all events, the proximity of Alexandria to the northern mountains, a fact which Arrian impreſſes very ſtrongly, renders it an impoſſible caſe, that Alexandria and Candahar can be one and the ſame place. Leaving Alexandria, at the foot of Caucaſus, Alexander came to the river Cophenes, and paſſed it in the higher part of its courſe. From Cophenes, Hepheſtion and Perdiccas, with a ſtrong a ſtrong detachment, were ſent into the country of Peucelaotis (Arrian) or Peucolaitis (Strabo) near the Indus. Alexander marched from the banks of the Cophenes againſt the Aſpii, Thyræi, and Araſaci, nations, whoſe ſituations and modern names are unknown, but ſuppoſed by Rennell to be inferior diviſions of the modern Cabul, and ſituated between the rivers of Ghizni and Cabul, at the height of Irjab and Dukkah. In his march to Arigæus, Alexander croſſed two rivers, the "Choe" and "Euaſpla," and defeating the Aſpians in a pitched battle, near the latter, paſſed through the territories of the Guræi, and croſſed the river of the ſame name (ſee GUREUS.) The Choe and Euaſpla may be two of the nine rivers of the Lumghanat. It is very difficult to determine the length of Alexander's march from the Cophenes to the Gureus; but it might poſſibly be 100 road miles. As Alexander had croſſed the Indus, probably at Attock, when he came to the bridge (which was completed before his arrival), he made an excurſion by land into the country adjacent to the weſtern bank of the Indus, in order to view the city of Nyſa (ſuppoſed by M. d'Anville to be Nughz, or Nagaz, the Nagara, or Dionyſiopolis of Ptolemy); and he is then ſaid to have entered the country, that lay between the two rivers, Cophenes and Indus. Admitting that the Cophenes is the river that runs by Nughz, and falls into the Indus, 30 or 35 miles below the city of Attock, and as the river Cabul joins the Indus in front of the city of Attock, it is clear that, till he came oppoſite to that city, he could not be between the Cophenes and Indus. And if it be ſaid, that the Cabul river was the Cophenes, he had all along been between the Cophenes and Indus; and Arrian's words could have no meaning. Upon the whole we may conclude that the ancient Cophenes was the ſame with the modern *Cow*, which ſee. Rennell's Memoir, p. 170, &c.

COPHOS, a place of Greece, in Attica, ſituated before Piræa.

COPHOSIS, in *Medical Writers*, is uſed for deafneſs, whether beginning, or perfect, or from what cauſe ſoever.

The word is derived from κοφεω, *I am deaf.*

COPHRANTA, or COPHANTA, an ancient town of Aſia, in Carmania. Ptolemy.

COPHSIS, SAMUEL, in *Biography*, a learned Jewiſh Rabbi of Spain in the eleventh century, was a native of Cordova, and publiſhed a commentary on the Pentateuch, the manuſcript of which is ſtill extant in the Vatican library. Thoſe who have examined it commend it as an excellent work, except that it too much abounds with allegories. The author died A.D. 1034.

COPHTI, COPHTS, or COPTS, a name given to the Chriſtians of Egypt; who are of the ſect of Jacobites.

They derive the latter appellation from the learned Jacobus Zanzalu, biſhop of Edeſſa, who, when the Coptic party had ſunk in number and credit, appeared in defence of the Monophyſite doctrine; and by his writings, as well as indefatigable travels through moſt parts of the Eaſt, ſucceeded to ſuch a degree in reviving and diſſeminating it, that he hath been reverenced and eſteemed by the whole ſect, which, from reſpect to him have aſſumed the name of Jacobites: though the other Chriſtians, as well as the Turks, call them by their old name Copts. By way of contempt ſome have called them "Kufti" or Girdlers, thus intimating that they are Chriſtians only from the girdle upwards, but bear the ſcar of Judaiſm below it.

The critics are extremely divided about the origin and orthography of the word: ſome write it *Gophti*, others *Cophtites*, *Cophtitæ*, *Copts*, &c. Scaliger derives the name from *Coptos*, an anciently celebrated town of Egypt, the metropolis of the Thebaid, whither they retired from the tyranny of the Greeks. Kircher refutes this opinion, and maintains, that the word originally ſignifies *cut* and *circumſcribed;* and was given theſe people by the Mahometans, by way of reproach, becauſe of their practice of circumciſing: but P. Sollier, another Jeſuit, refutes this opinion. Scaliger afterwards changed his opinion, and derived the word from Αιγυπτος, the ancient name of Egypt, by retrenching the firſt ſyllable; but this opinion, too, P. Sollier diſputes. Volney, concurring in opinion with Scaliger, obſerves, that the Arabic term *Kobti*, a Copt, ſeems to be an evident abbreviation of the Greek word *Ai-goupti-os*, an Egyptian; for the γ was pronounced *ou* among the ancient Greeks; and the Arabs, having neither *p* nor *g* before *a*, *o*, *u*, always ſubſtitute for thoſe letters *b* and *b*. John de Leo and others ſay, that the Egyptians anciently called their country *Elchibth*, or *Cibth*, from Cibth their firſt king, whence *Cophtite*, &c. others ſay from Cobtim ſecond king of Egypt. Vanſleb derives the word *Copht* from Copt, ſon of Miſraim, grandſon of Noah. All theſe etymologies P. Sollier rejects, on this principle, that were they true, the Egyptians ought all equally to be called *Cophti;* whereas, in effect, none but the Chriſtians, and among thoſe none but the Jacobites, bear the name; the Melchites not being comprehended under it. Hence he chooſes to derive the word from the name *Jacobite*, by retrenching the firſt ſyllable; whence *Cobite*, *Cobea*, *Copta*, and *Cophta*.

Several families of theſe Copts are to be found in the Delta; but the greateſt number inhabit the Said, where they in ſome places occupy whole villages. Both hiſtory and tradition atteſt their deſcent from the people who were conquered by the Arabs, that is, from that mixture of Egyptians, Perſians, and, above all, Greeks, who, under the Ptolemies and the Conſtantines were ſo long in poſſeſſion of Egypt. Their name, according to the etymology given of it by Scaliger and by Volney, ſeems to indicate that they are the remains of the ancient Egyptians; and this is the more probable, ſince we find them in the Said before the time of Diocleſian; and it is certain the Greeks were leſs numerous in the Said than in the Delta. This opinion of their origin is rendered ſtill more probable, by conſidering the diſtinguiſhing features of this race of people; and they are found to be all characteriſed by a ſort of yellowiſh duſky complexion, which is neither Grecian nor Arabian; they have all a puffed viſage, ſwoln eyes, flat noſes, and thick lips, or, in ſhort, the exact countenance of a Mulatto. Volney, when he ſaw the figure of the ſphynx, and obſerved its features to be preciſely thoſe of a negro, recollected the remarkable paſſage of Herodotus, in which he ſays, (lib. ii.) "For my part, I believe the Colchi to be a colony of Egyptians, becauſe, like them, they have black ſkins and frizzled hair." Hence he concludes, that the ancient Egyptians were real negroes, of the ſame ſpecies with all the natives of Africa; and though, as we might naturally expect, after mixing for ſo many ages with the Greeks and Romans, they have loſt the intenſity of their firſt colour, yet they ſtill retain ſtrong marks of their original conformation. "How are we aſtoniſhed," ſays Volney, "when we behold the preſent barbariſm and ignorance of the Copts, deſcended from the profound genius of the Egyptians, and the brilliant imagination of the Greeks; when we reflect that to the race of negroes, at preſent our ſlaves, and the objects of our extreme contempt, we owe our arts, ſciences, and even the very uſe of ſpeech; and when we recollect that, in the midſt of thoſe nations who call themſelves the friends of liberty and humanity, the moſt barbarous of ſlaveries is juſtified; and that it is even a problem, whether the underſtanding of negroes be of the ſame ſpecies with that of white men!" The language formerly ſpoken by the Copts furniſhes another argument in favour of the origin above aſcribed to them. On the one hand the form of their letters, and the greater part of their words, demonſtrate that the Greek nation, during the thouſand years it continued in Egypt, has left deep marks of its influence; but, on the other, the Cophtic alphabet has five letters, and the language a number of words, which are to be conſidered as the remains of the ancient Egyptian. Theſe, when critically examined, have a ſenſible analogy with the dialects of the ancient neighbouring nations, ſuch as the Arabs, Ethiopians, Syrians, and even thoſe who lived on the banks of the Euphrates; nor can it be doubted that all theſe languages are derived from one common ſtock. For upwards of three centuries, that of the Copts has fallen into diſuſe. The Arabs, diſdaining the language of the nations they ſubdued, impoſed on them, together with their yoke, the neceſſity of learning that of their conquerors. This obligation became even a law, when, about the end of the firſt century of the Hegira, the Caliph Waled I. prohibited the Greek tongue throughout his whole empire. From that time the Arabic became univerſal; and the other languages, confined to books, ſubſiſted only for the learned, who neglected them. Such has been the fate of the Cophtic. The prieſts and monks no longer underſtand it, in their ſcriptures and books of devotion in which alone it exiſts.

Mr. Browne, a late traveller in Africa, (p. 71.) does not admit this hypotheſis of Volney; for he obſerves, that the Copts, or original inhabitants of Egypt, have no reſemblance of the negro features or form; though they have ſome peculiarities of feature common to them all. Their hair and eyes are of a dark hue, and the former is often curled; but not in a greater degree than is occaſionally ſeen among Europeans. The noſe is often aquiline; and though the lips be ſometimes thick, they are by no means generally ſo; and on the whole, a ſtrong reſemblance may be traced between the form of viſage in the modern Copts, and that preſented in the ancient monuments, paintings, and ſtatues. Their complexion, like that of the Arabs, is of a duſky brown; it is repreſented of the ſame colour in the paintings, ſeen by Mr. Browne in the tombs of Thebes. The Coptic women have intereſting features, large black eyes, and a genteel form.

The Copts differ from the Arabs by their religion, which is Chriſtianity, and which they embraced at an early period; but they are again diſtinct from other Chriſtians by their opinions, which are thoſe of the Eutychians or Monophyſites. Their adherence to theſe opinions has expoſed them to the perſecution of the other Greeks, and thus they are rendered irreconcileable enemies. When the Arabs conquered the country, they took advantage of theſe animoſities, to enfeeble them both. The Copts, however, have at length expelled their rivals; and as they have been always intimately acquainted with the interior of the country, they are become the depoſitaries of the regiſters of the lands and tribes. Under the name of "Writers," they are at Cairo the intendants, ſecretaries, and collectors of government. Theſe writers, deſpiſed by the Turks whom they ſerve, and hated by the peaſants whom they oppreſs, form a kind of ſeparate claſs, the head of which is the writer to the principal Bey. He diſpoſes of all employments in that department, which, according to the ſpirit of the Turkiſh government, he beſtows on the beſt bidder.

The Copts endured many ſeverities, and were reduced to extreme poverty and diſtreſs by the intolerance and perſecution of the Greeks; but when Amrou invaded Egypt, A. D. 638, the Copts availed themſelves of the opportunity which was afforded by their voluntary ſubmiſſion to the conqueror for retaliation on their perſecutors. The Saracens were received by them as the deliverers of the Jacobite church; and during the ſiege of Memphis a ſecret and effectual treaty was opened between a victorious army and a people reduced to the moſt abject diſtreſs and bondage. "The Greeks," ſaid Mokawkas, a rich and noble Egyptian, connected with the Coptic ſect, in his firſt conference with Amrou, "are determined to abide the determination of the ſword; but with the Greeks I deſire no communion, either in this world or in the next; and I abjure for ever the Byzantine tyrant, his ſynod of Chalcedon, and his Melchite ſlaves. For myſelf and my brethren, we are reſolved to live and die in the profeſſion of the goſpel and unity of Chriſtians. It is impoſſible for us to embrace the revelations of your prophet; but we are deſirous of peace, and cheerfully ſubmit to pay tribute and obedience to his temporal ſucceſſors."

The tribute was aſcertained at two pieces of gold for the head of every Chriſtian; but old men, monks, women, and children, of both ſexes, under 16 years of age, were exempted from this perſonal aſſeſſment; the Copts above and below Memphis ſwore allegiance to the caliph, and promiſed an hoſpitable entertainment of three days to every muſſulman who ſhould travel through their country. By this charter of ſecurity, the Copts obtained a triumph over their enemies, and the ſacred edifices, with the patrimony of the church, were reſtored to the national communion of the Jacobites, who enjoyed without moderation the moment of triumph and revenge. From the ſuperiority thus acquired, and the conduct by which it was obtained, and by which it was ſucceeded, proceeded that permanent and invincible animoſity, which hath ſubſiſted between the Copts and the Greeks ever ſince their ſubjection to the Turks; and which the Romiſh miſſionaries have endeavoured to terminate, by uſing every method likely to reconcile both theſe ſects to the church of Rome. In the 17th century attempts were made for uniting the Monophyſites of Aſia with the Romiſh church, and they were attended with a partial and temporary ſucceſs; but the African Monophyſites, and more eſpecially the Copts, notwithſtanding that poverty and ignorance which expoſed them to the ſeductions of ſophiſtry and gain, maintained their principles with firmneſs, and made an obſtinate reſiſtance to the promiſes, preſents, and attempts, employed by the papal miſſionaries to bring them under the Roman yoke. The Copts, ever ſince the Saracen conqueſt above-mentioned, have had churches, prieſts, biſhops, and a patriarch, who fixed his ſeat of reſidence at Cairo, when that city became the capital. In their worſhip they blend a number of ſuperſtitious cuſtoms, which have been tranſmitted to them from their anceſtors and which they obſtinately retain. In other reſpects, ſays Savary (Letters on Egypt, vol. ii.) the Copts are gentle, humane, and hoſpitable. Paternal tenderneſs and filial love conſtitute the happineſs of their families. They honour and cheriſh all the ties of blood. The internal commerce, the art of hatching chickens, and that of bringing up bees, form almoſt their only ſcience. They often acquire conſiderable wealth in the management of the affairs with which they are entruſted, but they are never allowed to enjoy the fruit of their labours in tranquillity. The Bey, who ſees their opulence, ſtrips them without pity;—happy if they can ſecure their lives by the ſacrifice of their fortune. Theſe vexations, however, never excite them to revolt.

Their want of energy keeps them chained down to ſervitude and miſery, which they endure without murmuring. Mr. Browne repreſents the Copts as an acute and ingenious people, who get money ſteadily without oſtentation, conſidering, that, under an arbitrary government, obſcurity is ſafety. In their temperament, he ſays, they are melancholic, but, if called into action, induſtrious and laborious. However, they are fond of their diſtilled liquors, and rather licentious in their amours. They are zealous in their faith, this writer adds, and their eccleſiaſtics are numerous. The populous city of Cairo, as we have ſaid, affords a reſidence, or rather a ſhelter, for their indigent patriarch, and a remnant of 10 (ſome ſay 12 or 13) biſhops; 40 monaſteries have ſurvived the depredations of the Arabs; and the progreſs of ſervitude and apoſtacy has reduced the Coptic nation to the deſpicable number of twenty-five or thirty thouſand families; a race of illiterate beggars, whoſe only conſolation is derived from the ſuperior wretchedneſs of the Greek patriarch and his diminutive congregation.

The Coptic patriarch, though he reſides at Cairo, takes his title from Alexandria; and the body of the inferior clergy, whether ſecular or regular, is compoſed of the orders of St. Antony, St. Paul, and St. Macarius, who have each their monaſteries.

Beſides the orders of prieſts, deacons, and ſubdeacons, the Copts have likewiſe archimandrites, the dignity whereof they confer with all the prayers and ceremonies of a ſtrict ordination. This makes a conſiderable difference among the prieſts; and beſides the rank and authority it gives them with regard to the religious, it comprehends the degree and functions of archprieſts. By a cuſtom of about ſeven hundred years, if a prieſt elected biſhop be not already archimandrite, that dignity muſt be conferred on him before epiſcopal ordination.

The ſecond perſon among the clergy, after the patriarch, is the titular-patriarch of Jeruſalem, who alſo reſides at Cairo, becauſe of the few Copts at Jeruſalem; he is, in effect, little more than the biſhop of Cairo: only he goes to Jeruſalem every Eaſter, and viſits ſome other places in Paleſtine near Egypt, which own his juriſdiction.

To him belongs the government of the Coptic church, during the vacancy of the patriarchal ſee.

To be elected patriarch, it is neceſſary the perſon have lived all his life in continence: it is he confers the biſhoprics. To be elected biſhop, the perſon muſt be in the celibate; or, if he have been married, it muſt not be above once.

The prieſts and inferior miniſters are allowed to be married before ordination; but are not obliged to it, as Ludolphus erroneouſly obſerves. They have a great number of deacons, and even confer the dignity frequently on children. None but the loweſt rank among the people commence eccleſiaſtics; whence ariſes that exceſſive ignorance found among them: yet the reſpect of the laity towards the clergy is very extraordinary. Their office is longer than the Roman office, and never changes in any thing: they have three liturgies, which they vary occaſionally.

The monaſtic life is in great eſteem among the Copts; to be admitted into it, there is always required the conſent of the biſhop. The religious Copts make a vow of perpetual chaſtity; renounce the world, and live with great auſterity in deſerts: they are obliged to ſleep in their cloaths and their girdle, on a mat ſtretched on the ground; and to proſtrate themſelves every evening a hundred and fifty times, with their face and breaſt on the ground. They are all, both men and women, of the loweſt claſs of the people; and live on alms. The nunneries are properly hoſpitals; and few enter but widows reduced to beggary.

The preſent habitation of the Coptic cœnobites is ſituated in the deſert of Nitria, called alſo after the name of a famous ſaint denominated Macarius, and is diſtinguiſhed by the appellation of "Zaïdi el Baramous," and called by the Arabs, "Kaſr Zaïdi." It is an encloſure of high walls without any gate, unleſs that name ſhould be given to a ſmall wicket, which is opened only twice or thrice in the courſe of a year. Perſons entering or leaving it are hoiſted up and lowered down by means of a ſtrong rope and a pulley. The building is entirely conſtructed of ſoft calcareous ſtones, ſeveral of which contain foſſile ſhells. Within the walls there is a kind of ſmall fort, ſurrounded by ditches, over which is built a drawbridge. Here the monks retire, when the Arabs ſucceed in forcing the outer walls. In this little fort are a church, a ciſtern, and proviſions; in ſhort, every thing for enabling the monks to ſuſtain a long ſiege. Here they alſo keep their books, written in the Coptic language; which they cannot on any conſideration be prevailed on to part with, although they never read them, and ſuffer them to lie on the ground, eaten by vermin and covered with duſt. The cells of the monks are vaulted and very low, and are indeed no better than a ſort of dens, not unſuitable to the ignorant and ſlothful wretches who inhabit them. The church is ſimple in its conſtruction, and has no other ornament beſides a few oſtrich's eggs, and bad pictures of ſaints. It is impoſſible, ſays Sonnini, (Travels in Upper and Lower Egypt, p. 354.) to give an idea of the confuſion that ſometimes prevails in their church: they often know not what they are to ſing; one will have a particular anthem or pſalm, and another a different one: they then diſpute and come to blows; in the mean time a third chaunts a prayer, which is followed by the choir, and thus the quarrel terminates. Their ſinging conſiſts of Turkiſh and Arabic airs, accompanied by cymbals, the noiſe of which, mixed with their ſqualling voices, and their diſcordant muſic, makes the church re-echo with a medley of jarring ſounds. The prieſt celebrates maſs with water. They conſecrate common bread; which the prieſt cuts in pieces and mixes with water, which is likewiſe conſecrated. This makes a kind of ſoup, of which he eats a few ſpoonfuls; and afterwards adminiſters the ſacrament, alſo with a ſpoon, to all that are preſent. After the communion the prieſt waſhes his hands, and ſtanding at the door of the chancel, extends them to ſtroke the face of every one who paſſes. During maſs, the prieſt alſo bleſſes little loaves which are diſtributed at the cloſe of the ſervice. The prieſt who celebrates maſs is dreſſed in a kind of white ſhirt, made with a cowl, and covered with little croſſes. During the other prayers, he only wears a large fillet of white linen, with ſimilar little croſſes, half twiſted round his head in the form of a turban, with the two ends hanging down before and behind. In this convent there were only three prieſts and ſome friars, with a ſucceſſion of perſons who come hither from time to time to do penance, and who bring the monks the means of ſubſiſtence. Their fare conſiſts of bread, or rather biſcuit, made of flour of lentils, and rice boiled in ſalt and water, bad cheeſe, and a little honey; and their only beverage is a brackiſh and ill-taſted water. Their ſupplies are conveyed to them from the alms of the rich Copts at Cairo. In theſe monaſteries, ſeveral of which are found in this deſolate country, the Coptic travellers through the deſert are ſure of finding neceſſaries for themſelves and their horſes; which they obtain by ringing a ſmall bell, the cord of which hangs down on the outſide.

F. Roderic reduces the errors and opinions of the Copts to the following heads: 1. That they put away their wives, and eſpouſe others while the firſt are living. 2. That they have ſeven ſacraments; *viz.* baptiſm, the euchariſt, confirmation, ordination, faith, faſting, and prayer. 3. That they deny the Holy Spirit to proceed from the Son. 4. That they only allow of three œcumenical councils; that of Nice, Conſtantinople, and Epheſus. 5. That they only allow of one nature, will, and operation, in Jeſus Chriſt, after the union of the humanity with the divinity: in other words, they are Monophyſites, Monothelites, or Eutychians. Mr. Browne (*ubi ſupra*) ſays, that they embrace tranſubſtantiation; in which, and other points, the Catholics of Cairo think they approach their faith nearer than the Greeks. As to their errors in diſcipline, they may be reduced, 1. To the practice of circumciſing their children of both ſexes before baptiſm, which has obtained among them from the twelfth century. 2. To their ordaining deacons at five years of age. 3. To their allowing of marriage in the ſecond degree. 4. To their forbearing to eat blood: to which ſome add their belief of a baptiſm by fire, which they confer by applying a hot iron to their forehead or cheeks.

Others palliate theſe errors, and ſhew that many of them are rather abuſes of particular perſons, than doctrines of the ſect. This ſeems to be the caſe with regard to their polygamy, eating of blood, marrying in the ſecond degree, and the baptiſm of fire: as for circumciſion, it is ſaid not to be practiſed as a ceremony of religion, nor as of any divine appointment, but merely as a cuſtom which they derive from the Iſhmaelites; and which, perhaps, may have had its origin from a view to health and decency in thoſe hot countries.

The Copts have adopted, from the Mahometans, the cuſtom of frequent proſtrations during divine ſervice; of ablution after the conjugal rites, &c. In many reſpects their faith, diſcipline, and worſhip, reſemble thoſe of the Abyſſinians; ſee that article.

The Copts, at different times, have made ſeveral re-unions with the Latins; but always in appearance only, and under ſome neceſſity of their affairs. In the time of pope Paul IV., a Syrian was diſpatched to Rome from the patriarch of Alexandria, with letters to that pope; wherein he acknowledged his authority, and promiſed obedience; deſiring a perſon to be diſpatched to Alexandria, to treat about a re-union of his church to that of Rome: purſuant to which, Pius IV., ſucceſſor to Paul, choſe F. Roderic, a Jeſuit, whom he diſpatched in 1561, in quality of apoſtolical nuntio.

But the Jeſuit, upon a conference with two Copts deputed for that purpoſe by the patriarch, was made to know, that the titles of *father of fathers*, *paſtor of paſtors*, and *maſter of all churches*, which the patriarch had beſtowed on the pope in his letters, were no more than mere matters of civility and compliment; and that it was in this manner the patriarch uſed to write to his friends: they added, that ſince the council of Chalcedon, and the eſtabliſhment of ſeveral patriarchs independent of one another, each was chief and maſter of his own church. This was the anſwer the patriarch gave the pope, after he had received a ſum of money remitted to him from Rome, by the hands of the Venetian conſul.

COPHTIC, or Coptic, the language of the Copts, the ancient language of the Egyptians, mixed with a great deal of Greek; its alphabet being manifeſtly nothing elſe but Greek, with the addition of ſome few letters, to expreſs ſounds, which the Grecians had not, and which probably came to be uſed in Egypt after the time of Alexander; though we know that the Greek language, and perhaps alſo the Greek letters, were taught there long before, in the reign of Pſammetichus. Of this affinity the reader may judge, by the following table of the Cophtic alphabet:

Figure.	Name.	Power.	Figure.	Name.	Power.
Ⲁⲁ	Alpha	A.	Ⲡⲡ	Pi	P.
Ⲃⲃ	Bita	B. V.	Ⲣⲣ	Ro	R.
Ⲅⲅ	Gamma	G.	Ⲥⲥ	Sima	S.
Ⲇⲇ	Dalda	D.	Ⲧⲧ	Tau	T.
Ⲉⲉ	Ei	E.	Ⲩⲩ	Ypſilon	Y. U.
Ⲋⲋ	So	S.	Ⲫⲫ	Phi	Ph.
Ⲍⲍ	Zita	Z.	Ⲭⲭ	Chi	Ch. Græc
Ⲏⲏ	Hita	I. Æ.	Ⲱⲱ	O	O long.
Ⲑⲑ	Thita	Th.	Ϣϣ	Shei	Sh.
Ⲓⲓ	Iauda	I.	Ϥϥ	Fei	F.
Ⲕⲕ	Kappa	K.	Ϧϧ	Khei	Kh.
Ⲗⲗ	Lauda	L.	Ϩϩ	Hori	H.
Ⲙⲙ	Mi	M.	Ϫϫ	Janja	J.
Ⲛⲛ	Ni	N.	Ϭϭ	Shima	Sh.
Ⲝⲝ	Xi	X.	Ϯϯ	Dhei	Dh.
Ⲟⲟ	O	O ſhort.	Ⲯⲯ	Epſi	Pſ.

The old Cophtic, which Kircher maintains to be a mother-tongue, and independent of all others, had been much altered by the Greek; for beſides that it has borrowed all its characters from the Greek, with a very little variation, a great number of the words are pure Greek.

Voſſius, indeed, aſſerts, that there was no Cophtic language till after Egypt became ſubject to the Arabs. The language, according to him, is a mixture of Greek and Arabic: the very name thereof not being in the world till after the Arabs were maſters of the country. But this, M. Simon obſerves, proves nothing; except that what was anciently called Egyptian, has ſince by the Arabs been called Cophtic, by a corruption of ſpeech. There are, it is true, Arabic words in the Cophtic; yet this by no means proves but that there was a language before that time, either Cophtic or Egyptian. Pietro de la Valle obſerves, that the Copts have entirely loſt their ancient tongue; that it is now no longer underſtood among them; that they have nothing extant therein but ſome ſacred books; and that they ſtill ſay maſs in it.

All their other books have been tranſlated into Arabic, which is their vulgar tongue; and this has occaſioned the originals to be loſt: it is added, that they rehearſe the Epiſtles and Goſpels in the maſs, twice; once in Arabic, and once in Cophtic.

Indeed, if we believe F. Vanſleb, the Copts ſay the maſs in Arabic, all but the Epiſtles and Goſpels, which they rehearſe both in that and Cophtic.

It ſufficiently appears, that, after the conqueſt by the Saracens, the ancient language ſo far continued to be that of religion, that it was uſed in the divine ſervice; and in the country of the Copts, the goſpel, according to Niebuhr, is even now read in Cophtic: but he obſerves, that this tongue is not underſtood even by the prieſts, and that the ſervice is afterwards read in the Arabic, which is the preſent language of Egypt. Mr. Browne ſays, that in the Cophtic monaſteries, the prayers are read in Arabic, and the epiſtle and goſpel in Cophtic; but the prieſt is a mere parrot, repeating a dead letter.

The Cophtic tongue, at preſent, conſiſts chiefly of the old Egyptian and Greek, ſtill bearing evident marks of primitive antiquity in its ſtructure and conſtitution, with regard to which it differs ſo much from all the Oriental and European languages, that it is impoſſible to conceive it derived from any of them. For the Copts neither decline their nouns, nor conjugate their verbs, (not even thoſe of foreign extract,) otherwiſe than by prefixing particles ſometimes of one or more ſyllables, and ſometimes of a ſingle letter, which denote the caſe, gender, number, and perſon; ſeveral of them being often joined together in one word, and the primitive word uſually placed laſt. Hence the difficulty of this tongue conſiſts in the incredible combination of the words and particles, in the change of the vowels, and in tranſpoſing the middle part of the word, and in adding ſuperfluous letters; ſo that it requires great labour and ſkill to diſtinguiſh them.

From numerous and minute reſearches, Mr. Browne is led to affirm, that the Cophtic language may be conſidered as extinct: although in Upper Egypt, they unknowingly retain ſome Cophtic words.

F. Kircher is the firſt who publiſhed a grammar and vocabulary of the Cophtic. There is not known any book extant in the Cophtic, except tranſlations of the Holy Scriptures or of eccleſiaſtical offices; or others that have relation to theſe, as dictionaries, &c.

Dr. Woide, who began his Coptic ſtudies at Leyden, and was aſſiſted in them by Saholtz, the editor of La Croze's Coptic lexicon, returned his obligations by the ſervices which he rendered to him in that publication. He ſuperintended the impreſſion of the abridgement of it, which was publiſhed at Oxford, and there applied himſelf to the ſtudy of the Sahidic dialect, or that of the Upper Egypt. In 1778, he publiſhed the celebrated Coptic and Sahidic grammar of Saholtz, under the following title: "Chris. Saholtz *Grammatica Egypti utriuſque Dialecti, quam breviavit, illuſtravit, edidit* C. G. Woide." An excellent Coptic grammar was alſo publiſhed at Parma, in 1783, under the title, "*Didymi Taurinenſis Literaturæ Copticæ Rudimentum.*"

Cophtic, or Coptic *Bible.* See *Coptic* Bibles.

Cophtic *Liturgies* are three; one attributed to Baſil; another to St. Gregory, and the third to Cyril: they are tranſlated into Arabic for the uſe of the prieſts and people.

COPHTOS, in *Geography.* See Coptos.

COPIA Claudia Augusta Colonia, a name given to the modern Lyons.

Copia *Cornu.* See Cornucopia.

Copia *libelli deliberanda*, in *Law*, a writ that lay where a man could not get the copy of a libel at the hand of a judge eccleſiaſtical, to have the ſame delivered to him. Reg. Orig. 51.

COPIÆ, in *Ancient Geography*, a town of Italy, in the gulf of Tarentum; called alſo *Sybaris.*

Copiæ *Militares*, *military forces*, a military body inſtituted particularly by Auguſtus, for the defence of the Roman empire. It was divided into three claſſes or deſcriptions. The firſt, called *copiæ claſſicæ*, was deſtined to defend the ſeas and rivers againſt the incurſions of pirates, and to protect navigation; the ſecond, called *copiæ provinciales*, defended the frontiers, and encamped or ſojourned in the frontier towns, as neceſſity or occaſion required; and the third, called *copiæ urbanæ*, remained at Rome, as a guard for the capital, and alſo for the emperor, in caſe of need.

Copiæ *Provinciales.* See Copiæ *Militares.*

Copiæ *Urbanæ.* See Copiæ *Militares.*

COPIAPO, in *Geography*, one of the thirteen provinces into which the kingdom of Chili in South America is divided. It is ſituated in the moſt northern part of the kingdom, and is one of the richeſt metallic countries in the world. In this province are two mountains entirely compoſed of cryſtallized ſulphur, ſo pure that there is no occaſion for refining it. It has alſo mines of gold, ſilver, iron, copper, and lead. The whole ſoil is impregnated with ſal-gem; and ſalt-petre is common. It furniſhes alſo turquoiſes, that is, teeth or bone coloured green by metallic vapours. In this province and that of Coquimbo little rain falls; and earthquakes are ſeldom known in either of them. It has two ports; one of the ſame name, and another which lies 30 leagues further to the ſouth, and conſiſts only of a few huts.

Copiapo, a town of Chili, in the fore-mentioned province, to which it gives name; ſituated about 12 leagues from the ſea-coaſt, very irregularly built, but containing between three and four hundred families. S. lat. 26° 50′. W. long. 70° 18′.

Copiapo, a river of S. America, in Chili, which runs into the Pacific Ocean, a little to the north of the town of Copiapo.

COPIATA, under the *Weſtern Empire*, a *grave-digger.* In the firſt ages of the church, there were clerks deſtined for this employment. In the year 357, Conſtantine made a law in favour of the prieſts *copiatæ*, *i. e.* of thoſe who had the care of interments; whereby he exempts them from the luſtral contribution which all other traders paid.

It was under him alſo that they firſt began to be called *copiatæ*, *q. d.* clerks deſtined for bodily labour, from κοπος, of κοπω, *ſcindo*, *cædo*, *ferio*, *I cut*, *beat*, &c. Before that time they were called *decani* and *lecticarii*; perhaps, becauſe they were divided by decads or tens, each whereof had a bier or litter for the carriage of the dead bodies. Their place among the clerks was the next in order before the chantors.

COPING over, in *Carpentry*, a ſort of hanging over, not ſquare to its upright, but bevelling on its under ſide till it end in an edge.

Coping, among *Builders*, ſignifies the top or covering of a wall. The beſt copings are of hewn ſtone, where it can readily be procured: in other ſituations, where large paving-bricks are made of a good and durable quality, theſe may with propriety be uſed flat for coping. Bricks of particular ſhapes are often made for coping, either to be uſed ſingly, or firſt a courſe of two bricks in width, to form a projection for ſhooting the wet off the faces of the wall, and then a half cylindrical brick for completing the coping. Several years ago, Mr. Peter Wych communicated to the Society of Arts in London (Doſſie's Memoirs, vol. ii. p. 16.) a method of making a durable coping for garden walls, of a mixture of baked gypſum and coal-aſhes. We lately obſerved on the Grand Junction Canal, that ſeveral of their bridges have been repaired, where the coping ſtones were broken by accidents, with Parker's Roman cement; and that others of their bridges and walls were wholly coped with this compoſition, which appeared little inferior to ſtone in hardneſs, and leſs brittle than moſt kinds of coping-ſtones are. See Canal. In ſtony diſtricts, where the fields are ſeparated by rough and dry ſtone walls, the ſame are uſually coped by a row of rough and triangular ſtones, ſet edgeways on the top of the wall. The cementing of theſe together with a little good mortar is a good practice. Where the ſtone is leſs hard or durable, theſe kinds of dry walls are ſometimes coped with a circular ridge of good but very coarſe mortar, prepared for the purpoſe. The practice of properly ſecuring and attending to the coping of dry-built walls cannot be too much enforced, for want of which the rubbing of cattle and other accidents ſoon make breaches in ſuch walls, that are very expenſive to repair. In ſome counties, where ſtone is very ſcarce, and fuel for burning bricks very dear, garden and other walls are made of mud or tempered clay, with a mixture of chopped ſtraw or ſtubble to hold them together; and ſuch are ſometimes thatched with ſtraw, by way of coping: for both theſe, and the *piſé* walls, compoſed of dry earth rammed together in a mould, which have lately been introduced in England, muſt be carefully preſerved from the wet by a ſecure coping, or they ſoon moulder into their original dirt.

COPLAND, in *Geography*, the name of a cluſter of ſmall iſlands in the north Channel, nearly oppoſite to Donaghadee, in the county of Down, Ireland. One of them has a few cabins upon it; and another has a light-houſe, which is very uſeful to thoſe going to Belfaſt, or croſſing the Channel between Donaghadee and Portpatrick. That which has the light-houſe on it is in W. long. 5° 24′. N. lat. 54° 39′.

COPLE, a vicarage in Bedfordſhire, in Wixamtree hundred, is remarkable for being formerly the reſidence of ſir Samuel Luke, and of Butler, the author of Hudibras, which celebrated poem is ſuppoſed to have been written at Wood-End houſe, in this pariſh. The Ouſe navigation paſſes the northern extremity of this pariſh; and ſome years ago, a cut was made, a mile or more in length, for conveying barges up to a new houſe and premiſes, intended as a wharf, (now the Dog ale-houſe;) but for want of previous conſent on the part of the owner of this part of the Ouſe navigation, it was not permitted to be uſed. See Canal. The ſubſoil or ſtrata in this pariſh is clay throughout, with lime-ſtone at a conſiderable depth beneath the ſurface: for a conſiderable width next the Ouſe the clay is covered with gravel, and produces good turnip land.

COPOS, from κωπος, *labour*, in *Medical Writers*, is uſed for a wearineſs of the body, when the muſcles, or their fibres rather, are loaded and obſtructed with viſcous humours, ſo as to render them unfit for motion.

COPPA, Il Cavalier, called *Ant. Giarola*, in *Biography*, an hiſtorical painter, who was born at Verona about the year 1595, and became ſucceſſively the ſcholar of the celebrated Bologneſe maſters, Guido and Albano. He is conſidered one of the beſt imitators of the graceful and delicate manner of the former, although in his compoſitions he is ſometimes too crowded; and he was ranked by his ſecond maſter, Albano, amongſt his moſt favoured diſciples. He was ſome time painter to the court of Mantua, the churches of which city are enriched by many of his principal works. He died in the year 1665. Lanzi. Storia Pitt.

Coppa, in *Law*, a cop or cock of graſs, hay, or corn, divided into titheable portions; as the tenth cock, &c. This word in ſtrictneſs denotes the gathering or laying up the corn in copes or heaps, as the method is for barley or oats, &c. not bound up, that it may be the more fairly and juſtly tithed: and in Kent they ſtill retain the word, a *cop* or *cap* of hay, ſtraw, &c.

COPPARBERG, in *Geography*, one of the twenty-eight governments into which the kingdom of Sweden is divided, comprizing the province of Dalecarlia, is alſo called *Fahlun*, and *Gamla Copparberger*, old copper mines. It is a large, populous mine town, ſituated between two lakes and two mountains; 36 miles W. of Gefle, 24 N.E. of Hedemora, in N. lat. 60° 30′. The ſtreets are regular, but the houſes are all of wood, except the town's hall and two churches, the roofs of which are covered with copper. It is the fifteenth among the towns that vote in the Swediſh diet. The governor reſides at *Noor*, a royal manor near the town. The famous copper mine, which Guſtavus Adolphus uſed to call the Swediſh exchequer, lies a little to the weſt. It has been worked one thouſand years, and its copper is ſtill reckoned the beſt in Europe. From 1633 to 1761 it yielded 1,180,724 Swediſh ſhippounds. Its greateſt produce was in the year 1650, when it gave 20,321 ſhippounds. Since the year 1780, it yields nearly 6000 ſhippounds annually; but the expences increaſe in proportion, as the miners muſt go to a greater depth. In 1801, the mine was ſaid to be 1080 feet deep, and to give employment to 1200 workmen. The copper is found in large maſſes. Catteau Tableau de la Suede. Schlözer's Briefwechſel.

COPPAY, one of the ſmall weſtern iſlands of Scotland; 2 miles W. from the S.W. extremity of the iſland of Lewis.

COPPEL, Copel, or Cuppel, in *Chemiſtry*. See Cuppell.

COPPELLING. See Cuppellation.

COPPENBRUGGE, in *Geography*, a town of Germany, in the circle of Weſtphalia, and county of Spiegelberg; 19 miles S.W. of Hanover.

COPPER, *Kupper*, Germ. *Cuivre*, Fr. *Cuprum*, *Aes*. Lat. *Venus*, Alchem.

Copper is a ductile and malleable metal, of a pale yellowiſh red colour. It is ſoluble in moſt acids, and is precipitable from them in the metallic ſtate, by iron or zinc: its oxyd is ſoluble in ammonia, to which it communicates a bright blue purple colour.

§ 1. *Ores of Copper.*

Sp. 1. Native copper. *Gediegen Kupper*. *Cuivre natif.*

Its colour is a clear copper-red, often tarniſhed, externally yellowiſh, blackiſh, or whitiſh.

It occurs in maſs, diſſeminated, in leaves and grains, alſo capillary, moſs-like, dendritical and cryſtallized. The regular forms that it preſents, are the cube, the octohedron, and the pyramidal dodecahedron often with a ſhort ſix-ſided priſm interpoſed.

The cryſtals are ſmall, and generally implanted in each other, forming cluſtered maſſes. Its luſtre internally is gliſtening and metallic; its fracture is hackly: when cut or rubbed, it acquires a high metallic luſtre. It is not very hard, is malleable and flexible, but not elaſtic, is tough and difficultly frangible. Sp. gr. 7.72.—8.58.

It is fuſible before the blow-pipe, and appears to be pure copper.

It occurs in veins and beds in various primitive and ſecondary mountains, accompanied by many of the other ores of copper, alſo by galena, horn ſilver, native ſilver, calcareous, heavy, and fluor ſpars.

It is very extenſively, but not very abundantly, diffuſed; the largeſt maſſes appear to be procured from the copper mine river, within the arctic circle in North America; it is alſo of frequent occurrence in Japan and Brazil, in Siberia, Hungary, Norway, Sweden, Saxony, and Cornwall.

Sp. 2. Vitreous copper. *Kupperglas*. *Cuivre vitré*.

Its colour is dark lead-grey, paſſing into blackiſh-grey; it is often covered ſuperficially by a ſteel-coloured tarniſh. It occurs in maſs, diſſeminated or cryſtallized. The forms of its cryſtals are the cube, the octohedron, and a hexahedral priſm, ſometimes terminated by trihedral ſummits. The cryſtals are ſmall; externally they are ſhining, internally they exhibit a gliſtening metallic luſtre. The fracture is fine-grained, uneven, paſſing into conchoidal. It gives a ſhining ſtreak, is blackiſh when pulverized; is ſomewhat brittle, and eaſily frangible. Sp. gr. 4.1.—5.4.

It effervefces with nitrous acid, and when expoſed to the blow-pipe, gives a metallic button of a ſteel-grey colour, and generally attractible by the magnet.

When pure, it appears to be a ſimple ſulphuret of copper, conſiſting, according to Chenevix, of

81	Copper
19	Sulphur
100	

It is generally however mixed with iron in the proportion of from 3 to 6 *per cent.* A ſpecimen from Siberia was analyzed by Klaproth, and afforded

78.5	Copper
18.5	Sulphur
2.25	Iron
0.75	Silex
100.	

It occurs in veins and beds in primitive and ſecondary mountains, accompanied by copper pyrites, and other ores of this metal. It is not very abundant, but is found in various places, eſpecially Cornwall, Hungary, Saxony, Norway, and Siberia.

Sp. 3. Variegated copper. *Buntkupfererz.*

Its colour is intermediate between copper-red, and Tombac-brown; by expoſure to the air it acquires a ſuperficial tarniſh, which is firſt reddiſh, then violet, afterwards blue, and laſtly green. It occurs in maſs, diſſeminated, ſuperficial, or cryſtallized in octohedrons. Internally it is ſhining, with a metallic luſtre. Its fracture is ſmall, and imperfectly conchoidal, paſſing into fine-grained, uneven. It takes a poliſh by friction, and gives a reddiſh coloured ſtreak. It is ſoft, ſomewhat brittle, and eaſily frangible. Sp. gr. 4.9. 5.4.

It effervefces with nitrous acid, and melts readily before the blow-pipe, without vapour or odour. Two ſpecimens, the one from Hitterdahl in Norway, and the other from Rudelſtadt in Siberia, have been analyzed by Klaproth, with the following reſults.

Hitt.	Rud.	
69:5	58.	Copper
19.	19.	Sulphur
7.5	18.	Iron
4.	5.	Oxygen
100.	100.	

This ore occurs in beds, veins, and diſſeminated through rocks, for the moſt part belonging to the claſs of primitive. It is uſually accompanied by vitreous copper, and copper pyrites. It is found in Cornwall, in Hungary, Saxony, Norway, and Sweden.

Sp. 4. Copper pyrites. *Kupferkies. Pyrite cuivreuſe.*

Its colour is deep braſs-yellow, paſſing into gold-yellow. Its ſurface is often iridefcently tarniſhed. It occurs in maſs, diſſeminated, ſuperficial, ſtalactitical, cluſtered, reniform and cryſtallized in tetrahedrons, and the derivative octohedron, and dodecahedron. The cryſtals are uſually very ſmall and imperfect. The ſurface of the cryſtals is ſmooth and ſhining; that of the other varieties is rough and glimmering. The fracture is coarſe or fine-grained, uneven, paſſing into conchoidal, and imperfectly foliated. It is brittle, and with difficulty gives a few feeble ſparks with the ſteel; it may be readily cut by a knife. Sp. gr. 4.—4.1.

When expoſed to the blow-pipe on charcoal, it decrepitates, emits a ſulphureous vapour, and melts into a black globule, which, by further application of the heat, acquires the colour and luſtre of copper. It does not appear that the cryſtallized varieties of this ore have been regularly analyzed, and the proportion of its conſtituent parts cannot be eſtimated from the other varieties, on account of the iron pyrites, with which they are always more or leſs mixed. A ſpecimen analyzed by Lampadius afforded

41.	Copper
17.1	Iron
45.1	Sulphur
103.2	

The richer this ore is in copper, the ſofter it is, and its colour approaches the more to that of gold. It ſeldom, however, in the large way, affords more than 20 *per cent.* of copper. It may readily be diſtinguiſhed from iron pyrites (the only ſubſtance with which it is likely to be confounded) by the pale braſs yellow colour, and ſuperior hardneſs of the latter.

Copper pyrites is the moſt abundant, and moſt generally diffuſed of any of the ores of this metal. It occurs in veins and beds in primitive, tranſition, and ſecondary rocks, in moſt countries of the world.

Sp. 5. White copper. *Weiſs Kupfererz. Mine de cuivre blanche.*

Its colour is intermediate between ſilver-white and braſs-yellow. It occurs in maſs or diſſeminated. Internally it has a ſlight metallic luſtre. Its fracture is ſmall, and fine-grained uneven. It yields readily to the knife, is brittle, and eaſily frangible. Sp. gr. 4.5.

Before the blow-pipe it yields a white ſmoak, and an arſenical odour, and melts into a blackiſh ſlag. According to Henckel it yields about 40 *per cent.* of copper, the reſt being iron, arſenic, and ſulphur.

It occurs in veins and beds, in primitive mountains, and is generally accompanied by copper pyrites and vitreous copper.

It is found in Cornwall, Saxony, Sileſia, Hungary, Siberia, and Chili in South America.

Sp. 6. Grey copper. *Fahlerz. Cuivre gris.*

Its uſual colour is ſteel-grey, which paſſes into iron-black and lead-grey; ſome varieties incline towards yellow and others again preſent ſuperficial irideſcent colours. It occurs in maſs, diſſeminated or inveſting, or cryſtallized in regular tetrahedrons and their modifications. The cryſtals are ſmall, with ſhining ſurfaces. Internally it is gliſtening, or ſhining with a metallic luſtre. The fracture is coarſe, and ſmall-grained, uneven, inclining to imperfectly conchoidal. It gives a black or reddiſh-brown powder. It is moderately hard, brittle, and eaſily frangible. Sp. gr. 4.46.—4.36.

The only neceſſary ingredients of this ſpecies (as appears from an analyſis by Chenevix, of the cryſtallized variety) appear to be copper, iron, and ſulphur in the following proportions, *viz.*

52	Copper
33	Iron
14	Sulphur
99.	

The uncryſtallized varieties, however, generally contain alſo antimony, ſilver, and lead, but in very variable proportions. In ſeveral varieties from Germany, Mr. Chenevix found antimony varying in proportion from 5 to 38 *per cent.* but neither lead nor ſilver. Two ſpecimens, the one from Andreaſberg, and the other from Crannitz, have been analyzed by Klaproth with the following reſults.

Copper	31.36	16
Iron	3.3	13
Sulphur	11.5	10
Antimony	34.09	16
Silver	14.77	2.25
Lead	0.	34.
Silex	0.	2.5
	95.02	93.75

Finally, a ſpecimen from Piedmont has been examined by Napione, and found to conſiſt of

Copper	29.3
Iron	12.1
Sulphur	12.7
Antimony	36.9
Silver	0.7
Arſenic	4.
Alumine	1.1
	96.8

Thoſe ſpecimens that give a reddiſh-brown ſtreak, are generally the moſt abundant in ſilver.

It occurs in veins in ſlate, and ſome other of the neweſt primitive rocks, and in beds in the tranſition and floetz rocks. It is accompanied by copper pyrites, galena, manganeſe, ſpathoſe iron, and rarely by malachite. When it contains a notable proportion of ſilver, it is conſidered and worked as an ore of this metal.

It is found in Cornwall, and in the county of Ayr in Scotland; alſo in Bohemia, Hungary, Tranſylvania, Saxony, Heſſe, the Hartz, France, Spain, Piedmont, Sweden, Norway, Siberia, and Chili.

Sp. 7. Black copper. *Kupperchwartze. Cuivre noir.*

Its colour is intermediate, between blueiſh and browniſh black. It occurs in maſs, diſſeminated or inveſting. It is compoſed of dull moderately cohering particles. It is friable, ſlightly ſoils the fingers, is meagre to the feel, and heavy.

Before the blow-pipe it emits a ſulphureous odour, and melts into a ſlag that colours borax green. It has not been regularly analyzed, but is ſaid to contain from 40 to 50 *per cent.* of copper.

It occurs with other ores of copper, particularly copper pyrites, malachite, mountain green, and vitreous copper.

It is found of remarkable beauty, at Kupperberg, in Sileſia, alſo in Saxony, Hungary, Norway, and Siberia.

Sp. 8. Ruby copper. *Roth. Kuppererz. Cuivre oxydé rouge.*

Of this ſpecies, there are the three following varieties.

Var. 1. Lamellar.

Its colour is dark cochineal red, inclining ſometimes to lead grey; when cryſtallized it is often of a full carmine red. It occurs in maſs, diſſeminated and cryſtallized in cubes, and aluminiform octohedrons. The cryſtals are ſmall, and for the moſt part laterally aggregated: their ſurfaces are ſmooth and ſhining. Its internal luſtre is more or leſs ſhining, and is intermediate between metallic and adamantine. Its fracture is imperfectly foliated, paſſing into granular uneven. When in maſs it is uſually opake, or at moſt tranſlucent on the edges; the cryſtals are tranſparent, verging into tranſlucent. It gives a browniſh brick-red ſtreak, is moderately hard, brittle, and eaſily frangible. Sp. gr. 3.95.

By expoſure to the blow-pipe on charcoal, it is eaſily reducible to a metallic bead, without emitting either odour, or ſmoak. It diſſolves in the nitrous and muriatic acids, in the former with, and in the latter without, efferveſcence. According to Mr. Chenevix, it conſiſts of

88.5	Copper
11.5	Oxygen
100.	

It is met with chiefly in veins, and appears to be peculiar to primitive mountains. It is accompanied by native copper and other ores of this metal. It is found in Cornwall, in Hungary, Saxony, the Hartz, Siberia, Peru, and Chili.

Var. 2. Capillary.

This variety differs from the preceding in being of a ſomewhat lighter colour, ſuperior luſtre, and being compoſed of ſmall capillary cryſtals and thin flakes.

Var. 3. Compact.

It occurs in maſs and diſſeminated, but never cryſtallized. Its internal luſtre is glimmering, ſemi-metallic: its fracture is even; and it is opake. In other reſpects it agrees with var. 1.

Sp. 9. Tile-red copper. *Ziegelerz.*

This ſpecies preſents two varieties, indurated and earthy.

Var. 1. Indurated.

Its colour is intermediate between hyacinth and browniſh-red, paſſing on the one hand into lead-grey, and on the other into reddiſh-brown. It occurs maſſive and diſſeminated. The reddiſh kind has a glimmering luſtre and flat conchoidal fracture; the browner kind has a ſomewhat reſinous luſtre and a ſmall conchoidal fracture. It acquires a luſtre by friction, is moderately hard and brittle.

When expoſed to the blow-pipe it becomes black, and is infuſible without addition. Borax is tinged by it of a dirty green. It appears to be an intimate mixture of compact ruby copper with brown iron ochre, and its produce of copper varies from 10 to 50 *per cent.*

It occurs in veins with ruby copper, malachite, copper pyrites, and iron ochre.

Var. 2. Earthy.

Its colour is hyacinth-red, paſſing into reddiſh or yellowiſh brown. Its texture is between friable and ſolid. It occurs in maſs, diſſeminated, and inveſting copper pyrites. It is without luſtre, has an earthy fracture, and ſlightly ſoils the fingers. In its other characters it agrees with the preceding variety.

Sp. 10. Mountain blue. *Kupperlázar. Cuivre carbonaté bleu.*

Of this there are the two following varieties.

Var. 1. Radiated.

Its principal colour is ſky-blue, which paſſes into Pruſſian and indigo-blue. It occurs in maſs, diſſeminated or inveſting, more frequently botryoidal, ſtalactitic, and cellular, but moſt frequently cryſtallized in oblique rhomboidal priſms or octohedral priſms with dihedral ſummits. The cryſtals are generally very ſmall and aggregated into globular maſſes or bundles. The cryſtallized varieties are externally ſhining, but the reſt are dull. Internally it is ſhining or glittering, with a luſtre between vitreous and reſinous. Its fracture is ſtraight or divergingly radiated, rarely lamellar. The cryſtals are tranſlucent and ſemi-tranſparent, the other varieties are opake, or at moſt tranſlucent on the edges. When pulverized it is of a ſky-blue colour. It is ſoft, brittle, and eaſily frangible. Sp. g. 3.2.—3.4.

It is very difficult of fuſion before the blow-pipe, *per ſe*; but with borax it gives a bright green glaſs, and a metallic globule.

According to Pelletier it conſiſts of

66	to	70	Copper
18	—	20	Carbonic acid
8	—	10	Oxygen
2	—	—	Water

Var. 2. Earthy.

Its colour is ſmalt-blue: it occurs rarely in maſs, generally diſſeminated or ſuperficial: it is compoſed of fine pulverulent cohering dull particles. Its fracture is fine-grained earthy, paſſing into even and imperfectly conchoidal. It is opake, ſlightly ſtains the fingers, and is eaſily frangible.

Before the blow-pipe it becomes black, but does not melt. In borax it diſſolves with great ebullition, and forms a green glaſs.

Mountain-green occurs in the newer primitive rocks, but more commonly in floetz mountains. It accompanies other ores of copper, eſpecially malachite, grey copper, and copper pyrites. The moſt beautiful ſpecimens come from the Bannat in Hungary, and from Siberia. In the Tyrol it is found in ſufficient plenty to be manufactured into the pigment called mountain-blue.

Sp. 11. Malachite.

Of this there are the two following varieties.

Var. 1. Fibrous.

Its common colour is graſs-green paſſing into emerald-green, and ſometimes into dark leek-green. It ſeldom occurs maſſive or diſſeminated, but generally inveſting, and often cryſtallized in ſhort capillary needles, diſpoſed in divergent bundles, or ſtars. Externally they are ſhining, but internally only gliſtening with a ſilky luſtre. Its fracture is delicate, diverging fibrous, paſſing into coarſe fibrous. It is opake or tranſlucent on the edges; the cryſtals are for the moſt part tranſlucent. When pulverized it retains its colour, only the tint is ſomewhat lighter. It is very ſoft, brittle, and eaſily frangible. Sp. gr. 3.5.

It effervеſces with acids, and forms a blue ſolution with ammonia. Before the blow-pipe it blackens and decrepitates, but is infuſible, *per ſe*. With borax it melts into a green glaſs. Its conſtituent parts, according to Klaproth, are

58	Copper
18	Oxygen
12.5	Carbonic acid
11.5	Water
100	

It occurs uſually in the newer primitive and floetz mountains, accompanied by other ores of copper, alſo by carbonat of lead, calcareous ſpar, brown ſpar, and quartz. The fineſt ſpecimens of this variety of malachite are found in the Siberian and Hungarian mines; it occurs alſo in Saxony and other mining diſtricts in Germany, in Norway, and in Shetland, and the counties of Cornwall and Derby in Britain.

Var. 2. Compact.

Its colour is emerald-green paſſing into graſs and verdegris-green, the ſame ſpecimen exhibiting different ſhades of colour: its external ſurface is commonly overſpread with a greeniſh-white cruſt. It occurs maſſive and diſſeminated, but moſt frequently reniform, botryoidal, mamillated, ſtalactitic, or globular. Externally it is rough and dull; internally it is, according to the fracture, either dull, gliſtening, or ſhining. Its fracture is conchoidal, or fine-granular uneven, or minutely fibrous. It generally occurs in thin lamellar concentric diſtinct concretions, each of which has uſually a different ſhade of colour. It is opake, ſoft, brittle, and eaſily frangible. Sp. gr. 3.5.—3.6.

Its chemical characters and component parts are nearly the ſame as thoſe of the preceding variety, with which it alſo agrees in its geognoſtic and geographical ſituation.

Its beautiful colour, luſtre, and the high poliſh that it is capable of receiving, render it much ſought after for various ornamental purpoſes: it would however be much more eſteemed if it was harder.

Sp. 12. Mountain-green. *Kuppergrün. Vert de cuivre.*

Its colour is verdegris-green, paſſing occaſionally into emerald-green and ſky-blue. It occurs in maſs, diſſeminated or inveſting. Internally it is ſhining paſſing into glittering, with a reſinous luſtre. Its fracture is ſmall conchoidal. It is tranſlucent and ſemi-tranſparent; is ſoft and eaſily frangible.

Its chief chemical character is that of giving little or no effervеſcence, while diſſolving in acids. It has not been analyzed. It is found in ſimilar ſituations with malachite, but is of much rarer occurrence.

Sp. 13. Emerald copper. *Kupperſchmaragd. Dioptaſe* of Hauy.

Its colour is emerald-green. It occurs cryſtallized in lengthened dodecahedrons. It is ſhining both externally and internally, and has a vitreous luſtre. It is tranſlucent, paſſing to ſemi-tranſparent; ſcratches glaſs feebly, and with difficulty; is brittle. Sp. gr. 3.3.

Before the blow-pipe it becomes of a cheſnut-brown colour, and is infuſible, *per ſe*. With borax it gives a bead of copper. According to an analyſis by Vauquelin it conſiſts of

25.57	Oxyd of copper
42.85	Carbonat of lime
28.57	Silex
96.99	

It has hitherto been found only in Daouria on the Ruſſian and Chineſe frontiers in a vein accompanied by malachite.

Sp. 14. Micaceous copper. *Kupperglimmer.*

Its colour is deep emerald-green paſſing to verdegris-green. It occurs maſſive, diſſeminated, and cryſtallized in hexahedral tables. Externally it is ſmooth and ſhining with a pearly luſtre. Its fracture is foliated. It is tranſlucent paſſing into ſemi-tranſparent. It is ſofter than calcareous ſpar. Sp. gr. 2.54.

It decrepitates ſtrongly when ſuddenly heated, and is compoſed, according to Chenevix, of

58	Oxyd of copper
21	Arſenic acid
21	Water
100	

[2] It is found in Huel Gorland mine in Cornwall, in veins accompanied by vitreous copper, copper pyrites, arſenical pyrites, and iron ochre.

Sp. 15. Octohedral arſeniat of copper. *Linſenerz* of Werner.

Its colour is deep ſky-blue, paſſing into Pruſſian-blue, blueiſh-white, apple-green, and graſs-green. It occurs in obtuſe pyramidal octohedrons. The cryſtals are ſmall and aggregated into cluſters; they have a ſhining vitreous luſtre, and a lamellar fracture, are ſemi-tranſparent paſſing into tranſparent. In hardneſs they are inferior to fluor ſpar. Sp. gr. 2.88.

It is compoſed, according to Chenevix, of

49	Oxyd of copper
14	Arſenic acid
35	Water
98	

It is found in the ſame mine as the preceding ſpecies.

Sp. 16. Foliated arſeniat of copper. *Blattriges olivenerz* of Werner.

Its colour is olive-green, paſſing to oil and leek-green. It occurs rarely maſſive, and generally cryſtallized in acute rhomboids and oblique quadrilateral priſms. The ſurfaces of the cryſtals are ſmooth and ſhining. Internally it is gliſtening and ſhining, with a diamond luſtre. Its fracture is imperfectly foliated. It is tranſlucent paſſing into tranſparent. It is ſomewhat harder than calcareous ſpar. Its component parts, according to Chenevix, are,

54	Oxyd of copper
30	Arſenic acid
16	Water
100	

It is found in the ſame mine with Sp. 14.

Sp. 17. Fibrous arſeniat of copper. *Faſriges olivenerz.* Werner.

Its colour is browniſh, or dark bottle-green, paſſing into yellowiſh; when capillary it is of a lighter and brighter colour. It occurs cryſtallized in an irregular acute octohedron, or a long compreſſed hexahedral priſm, or capillary. Sometimes the cryſtals are regular at one extremity, and terminate in capillary bruſhes at the other. The cryſtals are ſmall and laterally aggregated. It has a conſiderable luſtre between vitreous and reſinous, is tranſlucent paſſing to tranſparent; is harder than fluor ſpar, but will not ſcratch glaſs. Sp. gr. 4.28. It paſſes into the two following varieties.

1. Amianthiform.

Its colour varies from blueiſh-green to graſs-green, brown-green, ſtraw-yellow, and white. It occurs in extremely minute parallel, or diverging flexible fibres, or thin duſty flexible laminæ, with more or leſs of a ſattiny luſtre.

2. Hæmatitiform.

Its colour is browniſh or whitiſh-yellow. It occurs in flat or mamillated layers, either ſmooth or varied with ſmall rough cryſtalline points.

Its texture is fibrous but very compact, reſembling wood-tin.

The above ſpecies, with its varieties, has been analyzed by Mr. Chenevix, with the following reſult:

Priſmatic.	Capillary.	Hamatiff.	
60.	51.	50.	Oxyd of copper
39.7	29.	29.	Arſenic acid
0.	18.	21.	Water
99.7	98.	100.	

It is found in Huel Gorland mine, in Cornwall.

Sp. 18. Phoſphat of copper.

Its colour is, externally, greyiſh-black; internally, between emerald and verdegris-green. It occurs in maſs, diſſeminated and cryſtallized in rhomboids. The cryſtals are ſmall and very ſmall; their luſtre is externally vitreous and ſhining. Internally, it is gliſtening with a ſilky luſtre. Its fracture is fine and diverging fibrous. It is opake, and moderately hard. It conſiſts, according to Klaproth, of

68.13	Oxyd of copper
30.95	Phoſphoric acid
99.08	

It has hitherto been found only at Firneberg in Cologne, in white druſy quartz.

Sp. 19. Sandy copper. *Saltzkupfererz.* Werner.

Its colour is emerald-green, paſſing into leek and olive-green. It occurs maſſive, diſſeminated, and cryſtallized in extremely minute ſix or four-ſided priſms. The ſurface of the cryſtals is ſmooth and brilliant, and their fracture lamellar. The maſſive variety is opake; the cryſtals are tranſparent. It is ſoft and eaſily frangible. Sp. gr. 4.43.

Before the blow-pipe on charcoal, it tinges the flame of a bright green and blue colour, and a metallic globule remains behind. It is ſoluble in nitrous acid, without efferveſcence. The following are its conſtituent parts, according to Prouſt and Klaproth.

Prouſt.		Klaproth.	
From Peru.	Chili.	Chili.	
76.595	70.482	73.	Oxyd of copper
10.638	11.446	10.1	Muriatic acid
12.767	18.072	16.9	Water
100.	100.	100.	

It is found looſe in the bed of a river at Kernolinos, in Chili, and elſewhere, though rarely in Spaniſh South America.

§ 2. *Aſſay and Analyſis.*

The aſſay of copper ores, (though by no means ſo accurate a method of aſcertaining their metallic contents as a regular analyſis) being the method by which the market price of the ore is always determined, requires the firſt notice. The beſt method, upon the whole, of conducting it, is as follows.

Firſt, expoſe a ſmall piece of the ore, under examination, to the action of the blow-pipe, and by the appearance and odour of the vapour given out, it is eaſy to diſcover whether it contains any arſenic or ſulphur. It may very probably contain both, in which caſe, take 300 grains of the ore coarſely pulverized, mix it with half its weight of ſawduſt, and keep it at a moderate red heat in an earthen crucible, till the diſengagement of arſenical vapour entirely ceaſes. Then pour the contents of the crucible into an iron mortar, and reduce them carefully to a fine powder. Transfer this powder to a teſt, and expoſe it to a good red heat, with occaſional ſtirring, till both the charcoal and ſulphur are burnt off. The reſidue is then to be accurately mixed with $\frac{1}{12}$ of its weight of lamp-black, half its weight of *pulverized* glaſs of borax, and a drop or two of oil; the maſs thus formed, is to be put into a ſound earthen crucible, a cover is to be luted on, and the whole is to be placed in a good wind furnace. The heat ſhould be moderate for the firſt quarter of an hour, to allow the borax time to combine with the earthy impurities of the ore; then a moderate white heat is to be applied for about twenty minutes. After this, the crucible being withdrawn and cooled, is to be carefully broken, and will be found to contain a button of copper, covered by vitreous ſcoriæ. The purity of the copper thus procured, is to be eſtimated from its colour, ſoftneſs, malleability, and tenacity; after which, a part of it may be cupelled with pure lead, in order to aſcertain whether it holds any ſilver or gold. If the ore contains ſulphur, but no arſenic, it may be mixed with half its weight of charcoal, and roaſted on a teſt, without being previouſly heated in the crucible. If the ore contains neither ſulphur nor arſenic, it ſhould be firſt moderately ignited in a covered crucible, to drive off any moiſture, and may then be treated with borax and lamp black, as already deſcribed.

The proper analyſis, by means of liquid menſtrua, is however much more accurate than even the moſt carefully conducted aſſay, and the general mode of proceeding with the ores of copper is, upon the whole, very ſimple. The copper, together with the other metals with which it may happen to be mixed, is to be ſeparated from the ſilex and ſulphur, by means of an acid, the other metals are then to be got rid of by their appropriate reagents, and the copper is then to be procured either in the ſtate of green carbonat, of black oxyd, or of pure metal; of the firſt, 180 parts are equivalent to 100 of metallic copper; and of the ſecond, 100 parts contain 80 of metal.

Previouſly to undertaking an analyſis, a part of the ſpecimen, under examination, ſhould be ſubjected to the uſual reagents, in order to aſcertain not indeed the proportion, but the nature of the ingredients of which it conſiſts; and, in few caſes is this more neceſſary than in the analyſis of the ores of copper, both as they are ſo numerous and ſo various in their compoſition. This previous examination being duly performed, the analyſis may be conducted in the following manner:

For the analyſis of the *pyritical*, and other *ſulphurized ores of copper*, provided they contain neither ſilver nor lead, take 200 grains of the pulverized ore, and digeſt it at a boiling heat with muriatic acid, (adding occaſionally a few drops of nitric acid) till every thing ſoluble in this menſtruum is taken up. Of the inſoluble portion, a part, conſiſting chiefly of ſulphur, will be found floating on the liquor; and this being waſhed, dried, and weighed, is to be ignited on a teſt, by which the ſulphur will be burnt off, and its amount may be eſtimated from the loſs of weight ſuſtained by the proceſs. The incombuſtible reſidue is to be digeſted in a little warm muriatic acid, and what remains inſoluble, is to be added to the other inſoluble reſidue. The muriatic ſolutions being mixed together, the whole is to be decompoſed by carbonated potaſh, and the precipitate, hence reſulting, is to be digeſted in repeated portions of cauſtic ammonia, as long as this latter acquires any blue tinge. The whole of the copper, and nothing elſe, will thus be taken up by the ammonia, from which it may be obtained in the ſtate of black oxyd, by the addition of a little cauſtic potaſh, and a boiling heat. The reſidue, inſoluble in ammonia, conſiſts of oxyd of iron, with perhaps a little alumine, which may be ſeparated by cauſtic potaſh, the alumine alone being ſoluble in this fluid. Finally, the portion inſoluble in muriatic acid, may be conſidered as little elſe than ſilex.

The ores which, beſides *copper*, *ſulphur*, and *iron*, contain *ſilver*, *lead*, and *antimony*, may be thus analyzed. The ore, reduced to fine powder, is to be repeatedly digeſted with moderately diluted nitric acid, as long as any thing continues to be taken up by this menſtruum. To the nitric ſolution is then to be added muriat of ſoda, which will throw down the ſilver in the ſtate of luna cornea; this being ſeparated, the lead is to be precipitated in the form of ſulphat, by ſulphat of ſoda; the ſolution is now to be ſuperſaturated with ammonia, which will diſſolve the copper, and eave behind the oxyd of iron, with probably a little alumine and ſilex. The copper is to be procured from the ammoniacal ſolution, in the manner directed in the preceding paragraph; and the oxyd of iron may be ſeparated from the admixed earths, by cauſtic potaſh. That portion of ore, inſoluble in nitric acid, is to be digeſted in muriatic acid, which will take up every thing except the ſulphur, ſilex, and probably a little luna cornea. Of this inſoluble reſidue, the ſulphur is to be burnt off by gentle ignition, and the remainder is to be fuſed with twice its weight of pearlaſh, by which the ſilver in the luna cornea will be reduced to the metallic ſtate. The muriatic ſolution being concentrated by evaporation, and then poured into a conſiderable quantity of water, will depoſit the antimony in the form of a white oxyd.

The ſimple *oxyds of copper*, are beſt analyzed by digeſtion in nitric acid, and then ſuperſaturating the ſolution with ammonia, by which any caſual admixture of iron will be ſeparated.

The *carbonats of copper* are to be thus treated. One portion is to be gently calcined in a covered crucible, and the loſs of weight ſuſtained, indicates the united amount of the water and carbonic acid. A ſecond portion is to be thrown into a known quantity of dilute ſulphuric acid, and the loſs of weight, by the efferveſcence which enſues, ſhows the amount of carbonic acid. The ſulphat of copper thus obtained, may be ſubſequently decompoſed, either by a ſtick of zinc, or by liquid ammonia.

The *arſeniats of copper* are moſt conveniently analyzed by firſt moderately heating them, in order to drive off and thus eſtimate the water, and then digeſting the reſidue in dilute nitric acid, by which it will be entirely diſſolved; nitrat of lead is then to be dropped in as long as it occaſions any precipitate, and this latter being removed, the fluid is to be evaporated nearly to dryneſs, after which, warm alcohol is to be added, which will take up the whole, except a white powder; this powder, and the precipitate on the addition of nitrated lead, are arſeniat of lead, 33.66 *per cent.* of which is arſenic acid. The alcoholic ſolution is then to be evaporated nearly to dryneſs, and then to be digeſted with ammonia, which will take up the copper, leaving behind any oxyd of iron that may have happened to be contained in the ore. The ammoniuret of copper, being decompoſed by cauſtic potaſh, gives the copper in the ſtate of black oxyd, which is that in which it exiſts in the ore.

The analyſis of *muriat of copper* is very ſimple. It was thus effected by Klaproth. The ore, being pulverized, was diſſolved in cold nitric acid, with the exception of 1.5 *per cent.* of oxyd of iron; the ſolution being then diluted, nitrat of ſilver was added, till it occaſioned no further precipitate; the luna cornea thus obtained, indicated, according to the known proportions of this ſalt, the amount of muriatic acid in the ore. The nitrous ſolution was then decompoſed, and the copper obtained in the metallic form, by means of a bar of iron.

Phoſphat of copper was thus analyzed by Klaproth. On digeſtion in nitric acid, the whole was taken up except a few grains of quartz; the exceſs of acid in the ſolution was then ſaturated by potaſh, and acetite of lead was poured in till it had quite ceaſed to occaſion any precipitate; the phoſphat of lead, thus obtained, was ſeparated from the ſolution, and ſulphat of ſoda was added to decompoſe and precipitate the ſmall exceſs of acetite of lead which had been made uſe of. A little ſulphuric acid was then added to the ſolution, and the copper was precipitated in the uſual way, by means of a bar of iron.

§ 3. *Reduction of Ores.*

The only ores of copper that are in fact wrought in the large way, and from which the copper of commerce is for the moſt part ſupplied, are the ſulphureous and arſenical ores of this metal. The method of reducing them, though conſiſting of a great number of proceſſes, on account of the powerful affinity, both of the arſenic and ſulphur, is yet upon the whole very ſimple, being little more than repeated roaſtings and fuſions, till the metal has acquired the neceſſary ductility, for it is never brought to a ſtate of abſolute purity, and the commoner ſorts contain both arſenic and antimony, in ſuch proportions, as to be wholly unfit for alloying with either gold or ſilver.

The rough ore, if ſimply ſulphureous, is broken into pieces not larger than an egg, and ſeparated as much as poſſible from the adhering earthy impurities; after which, it is piled in large kilns, and heat being applied at the bottom, the whole maſs becomes gradually heated, and a large portion of the ſulphur ſublimes out, and may be either collected by proper flues, or allowed to eſcape; this firſt proceſs occupies about ſix months, at the expiration of which time, the evaporation of the ſulphur ceaſes, and when the ore has cooled ſufficiently, it is in a fit ſtate to be ſmelted.

If, however, the ore is largely combined with arſenic, it is not capable of keeping up a long combuſtion of itſelf, nor is the heat thus generated adequate to the expulſion of the arſenic; a ſomewhat different method, therefore, of roaſting muſt be had recourſe to. For this purpoſe the ore is ſtill more carefully dreſſed than in the former caſe, and is reduced to pieces not larger than a hazle-nut. It is then ſpread on the floor of a large reverberatory furnace, and expoſed to a dull red heat, with frequent ſtirring, in order to offer freſh ſurfaces to the action of the flame. The arſenic and ſulphur by this treatment are rapidly driven off, and in about twelve hours the roaſting is completed.

The ore is now transferred into the fuſing furnace, which is a reverberatory of the common contruction; a little bruiſed lime-ſtone is generally added by way of flux, and in the courſe of four or five hours the fuſion is uſually complete; the ſlag, now of the conſiſtence of ſoft dough, is raked off, and the copper is diſcharged through a plug-hole into water, by which it is reduced into ſmall drops or grains.

The copper, however, though in the metallic ſtate, is ſtill very impure, being largely mixed with ſulphur and arſenic, which give it a grey colour, and render it perfectly brittle. In order to ſeparate theſe impurities, it is re-melted and granulated twice more or oftener, a conſiderable quantity of ſlag being ſeparated at each fuſion; but as this ſlag contains ſome copper it is not thrown away, but worked over again with the next charge of calcined ore. The number of fuſions and granulations entirely depend on the quantity of impurities, and the obſtinacy with which they combine with the copper; but when theſe proceſſes have been repeated the requiſite number of times, the granulated maſs is melted and caſt into pigs. Theſe again are broken to pieces, and roaſted for one or two days in a low red heat, and again melted and roaſted ſeveral times, till the metal approaches to the ſtate of malleable copper. It is now caſt into oblong maſſes, about 14 inches in length, and is fit for the refining furnace. In this it is again melted, with the addition of a little charcoal, till it acquires the neceſſary degree of malleability, and thus becomes ſaleable copper.

Sometimes lead is employed with good effect in the refining of copper, as it combines with, and ſcorifies iron, and the other eaſily oxydable metals in preference to copper. For this purpoſe the rough copper is ſpread on the floor of a furnace, and when it is in complete fuſion, about 6 or 8 *per cent.* of lead is thrown in, and well mixed with the reſt. In a ſhort time the ſurface of the melted metal becomes covered with a ſemi-vitreous blackiſh brown ſcoria, conſiſting of the mixed oxyds of lead, iron, and other impurities, together with a little copper. The firſt ſcoria being removed, a ſecond is formed, which is in like manner ſcummed off, and ſo on ſucceſſively, till, after ten or twelve hours, the copper is ſufficiently purified: this is aſcertained by the thinneſs of the film with which the melted copper is covered, and by its being of a brick-red colour, alſo by the circumſtance that if a rod of poliſhed iron is dipped into the fuſed maſs the portion of copper that adheres to it immediately falls off when the rod is dipped in cold water.

§ 4. *Chemical and Phyſical Properties.*

The colour of copper is yellowiſh-red; its hardneſs is ſuperior to that of ſilver, but ſomewhat inferior to that of platina; it is very tough, ductile, and malleable; hence it may be beaten into plates or drawn into wire of great ſtrength and compactneſs. It breaks with a hackly fracture. When rubbed, it emits a diſagreeable odour; to the taſte it is nauſeous and ſtyptic. The ſpecific gravity of Swediſh copper, which is the pureſt that is met with in commerce, amounts to about 8.89: that of the commoner ſorts does not exceed 8.6; while that of the Japaneſe copper, on the other hand, amounts, according to Bergmann, to 9.0.

The fuſing point of copper is nearly the ſame as that of gold, namely, a low white heat; before it melts, changeable priſmatic colours appear on its ſurface. When in fuſion, or even at a full red heat, if expoſed to the air, it is ſoon covered with a thin brittle plate of browniſh oxyd, that readily ſeparates from the metal when cold.

This ſubſtance is an imperfect oxyd, and was formerly called *copper aſhes*, *æs uſtum*, or *cinis æris*, and by repeatedly heating and cooling a bar of this metal, the whole may be thus changed. Theſe ſcales, according to Prouſt, are compoſed of about 62 *per cent.* of perfect or black oxyd, and 38 of copper nearly in the metallic ſtate; hence, when they are digeſted in cold dilute ſulphuric acid, only the former portion is taken up. By ſubſequent calcination, the ſcales are wholly converted into black oxyd, the weight of which is one-fourth more than that of the original copper. At a very high heat, this oxyd runs into a bright reddiſh-brown opake glaſs.

Copper, when in high fuſion, and in contact with the air, like all the other eaſily oxydable metals, is actually combuſtible; it burns with a beautiful light green flame; the ſame delicate tinge is viſible when a little of the oxyd, or of any of the ſalts of this metal, is ſtrewed on burning coals. The green flame thus produced depoſits a ſmall portion of greeniſh-grey pulverulent oxyd, and hence it gradually collects as a kind of ſoot in the chimnies of furnaces employed in ſmelting this metal.

Copper ſoon ruſts in a damp air, and becomes covered with a green cruſt of carbonated oxyd, but this coating, by its ſtrong adheſion to the metal beneath, long preſerves it from further alteration; hence it requires a length of time, and the concurrence of circumſtances peculiarly unfavourable to preſervation, in order to corrode entirely a thick plate of

this

this metal. Water is not decompoſed by copper even at a white heat.

With the exception of a few caſes, that will be mentioned preſently, copper appears to unite very uniformly with the ſame proportion of oxygen, forming (when uncombined with water and every other ſubſtance) a browniſh-black oxyd, of which one-fifth, or 20 *per cent.*, is oxygen, and the remainder copper. This oxyd is produced, as has been already mentioned, by boiling the precipitate from any of the cupreous ſalts by an alkali, or the ammoniuret of copper, with cauſtic potaſh or ſoda.

Copper, or rather its oxyd, combines with every acid, forming ſalts, many of which are both curious and important.

Sulphuric acid acts upon metallic copper only when concentrated and boiling hot. For this purpoſe take copper filings, or thin ſheet copper, put it into a glaſs veſſel with twice its weight of ſtrong ſulphuric acid, and heat the mixture. As ſoon as it begins to boil, much ſulphureous acid gas is given out, and at length the whole diſſolves into a dark-coloured liquor, which, by dilution with water, becomes of a fine blue. If common copper is uſed for this purpoſe, there always remains a black ſediment, which conſiſts for the moſt part of ſulphuret of copper. If the pure carbonated oxyds are employed, inſtead of the metal, they will be found to be ſoluble even in cold and diluted ſulphuric acid. The ſolution, in whichever way it is formed, depoſits, by evaporation and gradual cooling, rhomboidal cryſtals of a deep ſky-blue colour, which are ſulphat of copper, the *blue* or *Roman vitriol* of the ſhops.

The ſame ſalt is alſo met with native in copper mines, partly cryſtallized, but more generally diſſolved in the water which drains more or leſs into all mines. When native, it appears to be formed in conſequence of the iron pyrites being firſt vitriolized, and the reſulting ſulphat of iron re-acting on the copper.

Sulphat of copper has a very ſtrong, ſtyptic, ſomewhat acidulous, and exceſſively nauſeous taſte. It is ſoluble in about four times its weight of water. When dried at a heat not exceeding that of boiling water, it loſes, according to Prouſt, about 36 *per cent.*, which is mere water, after which the reſidue, which is a white pulverulent maſs, is again ſoluble and cryſtallizable, as at firſt. But if it is calcined with a ſtrong white heat, the acid itſelf is expelled without undergoing decompoſition, and at length there only remains black oxyd of copper, in the proportion of 32 *per cent.* of the original cryſtallized ſalt. Hence 100 parts of ſulphat of copper conſiſt, according to Prouſt, of

Copper 25.6	forming black oxyd	32
Oxygen 6.4		
	Sulphuric acid	32
	Water	36
		100

Bergmann's analyſis of this ſalt nearly agrees with that of Prouſt in the proportion of copper (26 *per cent.*); but of the other ingredients he reckons 28 of water, and 46 of acid.

Beſides the common ſulphat, Prouſt deſcribes a *ſub-ſulphat* of copper. This is prepared by adding to the common ſulphat ſome cauſtic potaſh, but not ſufficient entirely to decompoſe it. A green precipitate is in conſequence depoſited, which is the ſub-ſulphat in queſtion. This ſalt loſes by diſtillation only 14 *per cent.* of water. The reſidue, boiled with cauſtic potaſh, gives 68 *per cent.* of black oxyd; hence its component parts are

Copper 54.4	68
Oxygen 13.6	
Sulphuric acid	18
Water	14
	100

Sulphat of copper is decompoſed by the alkalies, whether pure or carbonated. If either of the fixed alkalies in their cauſtic ſtate is made uſe of, the precipitate is not, as might be ſuppoſed, a ſimple oxyd of copper, but that peculiar combination firſt diſcovered by Prouſt, and named by him *hydrat of copper*. It is thus prepared: to a cold ſolution of ſulphat of copper add liquid potaſh, alſo cold, to complete ſaturation; a *blue* precipitate falls down, which, when thoroughly waſhed with boiling water, is the pure hydrat. Its conſiſtence, when dried at a heat not exceeding 212° Fahr., is nearly that of Pruſſian-blue; at a ſomewhat higher temperature it ſhrinks, and is gradually converted into black oxyd, by the evaporation of its water. By dry diſtillation it is found to give out about 24 *per cent.* of water, and 1 of carbonic acid, which it probably has abſorbed from the air while drying: there remain behind 75 parts of black oxyd. If this latter is again moiſtened with water, it does not return to the ſtate of hydrat. Hence it appears that the hydrat is a true chemical combination of water and oxyd of copper, in the proportion of about one part of the former to three of the latter, and as ſuch enters into the compoſition of the cupreous ſalts. The hydrat is decompoſable not merely by heat, but alſo by *boiling* with either of the fixed alkalies.

Carbonic acid and oxyd of copper unite together without difficulty. This combination is found native, forming the mountain-blue, the malachite, and ſome of the other ores of copper. It may be prepared artificially by expoſing the metal to a damp confined air, in which caſe it conſtitutes ruſt of copper; or more expeditiouſly by decompoſing any of the acid ſalts of copper by a carbonated alkali. A copious bulky precipitate falls down, which, when well waſhed and gently dried, is a fine powder, of a beautiful pale apple-green colour. One hundred parts of copper diſſolved in any acid, and precipitated by carbonated potaſh or ſoda, produce invariably 180 of the green carbonat, dried at a boiling-water heat. This carbonat, when diſtilled by itſelf, with a heat gradually increaſed to redneſs, gives out 10 parts of water, and 46 of carbonic acid; the black oxyd, remaining behind in the retort, amounts to 125 parts, of which 100 are copper, and 25 oxygen.

When hydrat of copper is gently heated with a ſolution of ſuper-carbonated potaſh, a portion is diſſolved, forming a greeniſh-blue liquor, whilſt the undiſſolved reſidue becomes almoſt as dark in colour as the black oxyd. The ſolution, if ſlowly evaporated, yields a ſingular ſalt, conſiſting of 52 *per cent.* potaſh, 43 carbonic acid, and 5 oxyd of copper. It is cryſtallizable and ſlightly deliqueſcent. A ſimilar ſalt, with a baſe of ſoda, is produced, when this latter alkali is employed inſtead of potaſh.

Copper is very readily ſoluble in nitric acid, even when cold and conſiderably diluted. Much heat is excited, and a torrent of nitrous gas given out, the liquor becoming of a bright blue colour in proportion as the copper is diſſolved. The oxyds of copper are equally ſoluble in this acid as the metal is, but without the evolution of nitrous gas. When this ſolution is haſtily evaporated to a certain point, and then ſuffered to cool, it congeals into a deep blue ſaline maſs, which deliquiates rapidly when expoſed to the air. By a ſlow and careful evaporation this ſalt may be obtained in the form of hexahedral priſms, but equally deliqueſcent as the former amorphous variety. If this blue nitrat be evaporated beyond the point at which it would cryſtallize when cold, nitrous gas begins to be produced, and a green ſcaly concretion ſeparates from the thick blue liquor. If the evaporation is here ſtopped, this green matter may be ſeparated by water, either hot or cold, which diſſolves only the undecompoſed blue nitrat. This green ſubſtance is conſidered by Prouſt as a ſubnitrat of copper; that it ſtill contains nitric acid is proved by its ſtill giving out this acid when mixed with ſulphuric acid and heated. By thorough calcination all the acid and water are expelled, and the black oxyd of copper only remains. The proportions of the ſubnitrat, according to the above-mentioned chemiſt, are

Black oxyd of copper	67
Nitric acid - -	16
Water - -	17
	100

The blue or perfect nitrat, on the other hand, contains only 27 *per cent.* of black oxyd.

Nitrat of copper is very ſoluble in alcohol, to the flame of which it communicates a very delicate green colour.

The decompoſition of this nitrat by tin is ſo violent as in certain caſes to produce actual combuſtion. This forms an amuſing experiment, and was, we believe, firſt diſcovered by Dr. Higgins. It is thus performed; ſpread out a piece of tin-foil four or five inches ſquare, lay in the middle a ſmall heap of the ſolid blue nitrat, ſprinkle the ſalt with a few drops of water, ſpread over it a little tow, then double up the tin-foil round it on all ſides, twiſting it as tight as may be without breaking. In a ſhort time the maſs will feel burning hot, ſmall bubbles of blue liquor will be ſeen oozing through, and will preſently be ſucceeded by a copious eruption of nitrous gas, attended by minute ſparks of fire and deflagration.

A fine blue pigment is prepared from nitrated copper, called *verditer (cendres blues, Fr.)* It is made in quantity by the refiners, who, after the proceſs of ſeparating ſilver from gold by aquafortis, recover the ſilver from its ſolution by means of copper, and thus obtain a reſidue of nitrat of copper. This ſolution is decompoſed by lime (the preciſe method of doing which is kept ſecret), and the produce being made into cakes and dried ſlowly conſtitutes the beſt kind of verditer.

This pigment has been analyzed by Pelletier with the following reſults. It was totally ſoluble in nitric and muriatic acids, with a copious effervеſcence of carbonic acid: when diſtilled by itſelf 600 hundred grains loſt 200, and afforded 2 French pints of carbonic acid together with ſome water. The calcined reſidue was a black powder, which, being fuſed with a reducing flux, yielded a button of pure copper, amounting to about half the weight of the original verditer. A freſh parcel was then treated with ſulphuric acid, which afforded ſulphat of lime, the earth of which formed about 7 *per cent.* of the original verditer. Of the 200 grains loſt by diſtillation, Pelletier conſiders 180 as carbonic acid. Hence 100 parts of verditer contain

Copper	50
Carbonic acid	30
Water -	$3\frac{1}{3}$
Lime -	7
	$90\frac{1}{3}$
Remains for oxygen	$9\frac{2}{3}$
	100

But in this eſtimate the amount of carbonic acid is by ſome overſight greatly overrated. The quantity obtained from 600 grains was about 2 French pints, the weight of which, according to Lavoiſier, would be only 66 grains; conſequently 100 grains would yield only 11 grains of this acid. The water was obviouſly only eſtimated at random, and as the copper was in the ſtate of hydrat, certainly amounted to much more than Pelletier has allowed for it. The corrected reſults of the above analyſis therefore would be

Copper	50	83.3	Hydrat of copper
Oxygen	12.5		
Water	20.8		
Lime	-	7.	
Carbonic acid		11.	
		101.3	

which correſponds very cloſely with the quantity analyzed.

The muriatic acid diſſolves copper with difficulty except when concentrated and boiling, and then hydrogen gas is given out. The oxyds, however, of this metal, and eſpecially the green carbonat, are very readily ſoluble in this acid. The colour of muriat of copper when hot or highly concentrated is brown, but by dilution becomes of a graſs-green. By careful evaporation and cooling it cryſtallizes in lengthened rhomboids, and when haſtily evaporated in feathery cryſtals. This ſalt is commonly deliqueſcent, but when both the copper and acid are quite free from iron is permanent in the air. It is readily ſoluble both in water and alcohol; the latter takes up its own weight when boiling, a part of which afterwards ſeparates in a cryſtalline ſtate as the liquor cools. The compoſition of the cryſtallized ſalt is, according to Prouſt,

Black oxyd of copper	40
Muriatic acid -	24
Water - -	36
	100

A dilute ſolution of muriated copper in water makes a kind of ſympathetic ink, which is colourleſs in the cold, becomes yellow by warming, and again loſes its colour on cooling. Beſides the common muriat, the ingenious reſearches of Prouſt have diſcovered a ſecond muriat, in which the copper appears to be at a lower ſtate of oxydation than in the former ſalt. It affords a nearly colourleſs ſolution, and when ſolid is of a greyiſh white; it may therefore without impropriety be called the white muriat of copper. It is prepared from the common muriat by means of muriat of tin, a ſalt remarkable for the eagerneſs with which it abſorbs oxygen from almoſt all the other metallic ſalts. If therefore ſome of this latter is poured into common muriat of copper, a precipitate falls down which is at firſt white, but by ſubſequent expoſure to air paſſes through different ſhades of violet and blue to black. This precipitate is for the moſt part a muriated ſub-oxyd of copper. On expoſure to a moderate heat it melts like luna cornea. If digeſted in warm muriatic acid it readily diſſolves, and is depoſited, on cooling, in the form of tetrahedral cryſtals. With nitrous acid ſome nitrous gas is given out, which ſhews that the metal was not previouſly ſaturated with oxygen. Another remarkable character of this white muriat is, that when diſſolved in ammonia the ſolution is colourleſs, though, on expoſure to the air, it gradually acquires the ſky-blue colour of common ammoniuret of copper. Its compoſition, according to Prouſt, is

Muriatic acid	24.75
Oxyd of tin	1.
Copper -	63.
Oxygen -	11.25
	100.

Aſſuming this analyſis as correct, it is obvious that the copper exiſts in a much lower ſtate of oxygenation in this ſalt than in any hitherto mentioned, for in this the oxyd of copper is compoſed of 63 of metal and 11.25 of oxygen, or (reduced to the hundred) of 84.84 copper, and 15.16 oxygen, whereas the black copper, to which all the common cupreous ſalts are reducible by loſs of their acid and water, conſiſts of 80 *per cent.* copper, and 20 oxygen.

There appears to be yet another ſtate of combination of muriatic acid and oxyd of copper, alſo firſt noticed by Prouſt. It is the *ſubmuriat of copper*, differing from the common muriat not by a lower degree of oxygenation in the metal, but in a ſmaller proportion of acid. It is produced by adding a little potaſh (leſs than required for ſaturation) to the green muriat. A green powder falls down, which is the ſubmuriat in queſtion. This ſalt when boiled with potaſh loſes about 28 *per cent.* of its weight, and is reduced to the black oxyd. A ſimilar ſubmuriat is ſaid by the ſame chemiſt to be ſpontaneouſly depoſited when copper is diſſolved in nitro-muriatic acid. The compoſition of this laſt is as follows:

Black oxyd of copper	79.
Muriatic acid -	12.5
Water - - -	8.5
	100.

The native green muriat of copper from Peru appears to be nearly in this ſtate.

Copper ſeems to have a ſtronger affinity for muriatic acid than even for the nitric or ſulphuric. Thus, if either the ſolid nitrat or ſulphat of copper be digeſted in muriatic acid a ſolution takes place, and then, on the application of heat, the liquor immediately loſes the blue colour, characteriſtic of theſe two ſalts, and acquires the green of the muriat: alſo by ſlow evaporation muriat of copper is obtained in cryſtals.

Acetous acid has no action on reguline copper, but its oxyd is eaſily ſoluble in this fluid, to which it communicates a beautiful graſs-green colour. There are two ſpecies of acetited copper, the one with an exceſs of baſe, the common verdegris of the ſhops, and the other in which the acid and oxyd are in a ſtate of mutual ſaturation, forming the cryſtallized or diſtilled verdegris.

The manufacture of verdegris is carried on to a conſiderable extent in moſt of the ſouthern provinces of France, and a very exact account, apparently, of the proceſs has been publiſhed by Chaptal, from which the following particulars are extracted.

The materials for this manufacture are the *marc* or cake that remains in the wine-preſs, after the greater part of the juice has been ſqueezed out; and plates of copper of convenient ſize and hammered well, in order to ſmooth the ſurface, that the corroded portion may be readily detached from the reſt.

The marc of the grape is firſt fermented by being laid as lightly as poſſible in a large barrel and moiſtened with common wine, and then ſet in a warm airy place. In a few days, varying according to the heat of the weather, it begins to ſwell, grows hot and exhales a ſtrong odour of vinegar; the fermentation then declines and the marc is fit for uſe. A layer of this is then put into an earthen pot and a plate of copper, previouſly made ſcorching hot, is laid upon it; to this ſucceeds another layer of marc, and then a plate of copper, in regular alternation till the pot is filled, obſerving that both the top and bottom layers are of marc. The mouth of the pot is then looſely ſtopped with ſtraw, and the whole is left at reſt from ten to twenty days.

When the marc begins to whiten the pots are unpacked, and, if the proceſs has gone on well, the copper-plates are found covered with a green cruſt, interſperſed with ſilky green cryſtals. The marc is thrown away; the plates are ſet on end on wooden racks in a cellar, and when dry are dipped in water and again ſet to dry; this is repeated once a week for ſix or eight times, which makes the cruſt of oxyd ſwell and increaſe both in quantity and quality: after which it is ſcraped off by a knife without difficulty. Each pot yields about 5 or 6lbs. of rough verdegris, and the plates will ſerve again repeatedly till they are corroded quite through.

This rough verdegris is further prepared for market by being ground in wooden mortars, and expoſed to the air till it is ſufficiently dry; and in ſo doing it loſes about half its weight.

Verdegris thus prepared, may be conſidered as copper oxydated by the action of the acetous acid, and combined with water, with carbonic acid, and with part of the extractive or mucilaginous part of the marc. It is nearly inſoluble in water and its colour is blueiſh green. If this verdegris is digeſted in diſtilled vinegar it diſſolves readily in this fluid, and by evaporation and cooling a cryſtallized ſalt of a deep green colour may be obtained, which is known in the ſhops by the name of *diſtilled verdegris.* The method in which this valuable ſalt is prepared at Montpellier is as follows. Common vinegar is firſt diſtilled in a copper alembic, and the acid thus produced is put with common verdegris into a copper boiler; when a hot ſaturated ſolution is thus made, it is ſtrained and transferred to another copper evaporating veſſel, where it is boiled down till a ſaline cruſt begins to collect on its ſurface; a light frame of croſs ſticks is now ſunk into the liquor and the fire is put out. On cooling, the acetite of copper cruſts round the ſticks in cluſters of rhomboidal cryſtals of a deep blueiſh-green colour. It requires about 3lbs. of verdegris to make 1lb. of the cryſtallized acetite.

The compoſition of common verdegris is ſubject (as might be expected from the method in which it is prepared) to a conſiderable variation, and this difference is ſtill further increaſed by variations in the way of manufacturing this ſalt. Thus, at Grenoble, verdegris is made merely by diſpoſing plates of copper in a proper room, and moiſtening their ſurfaces repeatedly with diſtilled vinegar, till the incruſtation of oxyd acquires a proper thickneſs. Hence this latter is purer, and approaches nearer to the ſtate of cryſtallized acetite, than that of Montpellier.

A hundred parts of the verdegris of Grenoble yield, according to Chaptal, by dry diſtillation,

Carbonic acid	- - -	9.1
Water weakly acidulous	-	13.05
Strong, and coloured acetous acid		53.95
Left in the retort	Copper - -	20.9
	Charcoal - -	3.
		100.

A like quantity of the Montpellier verdegris afforded

Carbonic acid - - -	8.
Acetous acid, weak and empyreumatic,	65.15
Copper - - - -	22.5
Charcoal - - - -	4.35
	100.

To the above particulars may be added ſome obſervations, by Prouſt, on the properties and compoſition of this ſalt.

When common verdegris is put into cold water, it gradually falls to pieces and nearly half of it is diſſolved, the remainder is a fine green powder which diffuſes itſelf through the liquor and ſubſides very ſlowly. This green powder appears to be pure ſubacetite of copper, and when waſhed and dried weighs about 42 *per cent.* of the original verdegris. When ſulphuric acid is poured on it, pungent vapours of vinegar are given out. Boiled with potaſh it affords 63 *per cent.* of black oxyd; and when diſtilled, after all the volatile products have paſſed over, there remains about 52 *per cent.* of copper, principally in the metallic ſtate. From theſe data therefore the ſubacetite appears to conſiſt of

Copper	50.4	forming black oxyd	63
Oxygen	12.6		
		Remains for acid and water	37
			100

With regard to the cryſtallized acetite, Prouſt found that 39 parts of black oxyd produce, with diſtilled vinegar, 100 parts of acetite; and on the other hand, that 100 parts of this ſalt, when decompoſed by boiling with potaſh, yield 39 or 40 parts of black oxyd. Hence it is compoſed of

Copper	31.2	forming black oxyd	39
Oxygen	7.8		
Acetous acid		- - - -	61
			100

The diſtillation of the cryſtallized acetite furniſhes the moſt pungent acetic acid, or radical vinegar, as has been already deſcribed under ACETOUS ACID. Acetite of copper, beſide being made by direct combination of its ingredients, may be prepared in various ways by double affinity; of theſe the beſt upon the whole is the following: Make a cold ſolution of ſugar of lead *(acetite of lead)* in diſtilled water, to which add, by degrees, a cold ſolution of blue vitriol *(ſulphat of copper)*, as long as any precipitation takes place; then pour the whole on a filter, and a green liquor paſſes through, the ſulphat of lead remaining on the filter, in the form of a white powder. The green liquor, being concentrated by evaporation, depoſits, by cooling, very pure and beautiful cryſtals of acetite of copper.

The natural combinations of copper with arſenic and arſenic acid have already been noticed. With regard to the artificial arſeniats, Scheele diſcovered that when arſenic acid is digeſted with copper filings, a green ſolution is formed, and a blue powder, which is alſo an arſeniat, is precipitated. The ſulphat, nitrat, and muriat of copper undergo no apparent change, when added to arſenic acid; but the acetite is decompoſed, and arſeniat of copper is precipitated. All the cupreous ſalts, however, are decompoſed by arſeniated alkali, and a blue arſeniat falls down. To theſe facts Mr. Chenevix has added the following: If arſeniat of ammonia and nitrat of copper are added, there falls down a blue cryſtalline arſeniat of copper. On evaporating the ſupernatant liquor, and adding alcohol, another copious depoſition of cryſtals took place, of a deeper colour than the former, and of a rhomboidal ſhape. Each of theſe arſeniats was examined ſeparately, firſt by calcination at a low red heat to expel the water, then by potaſh for the black oxyd of copper, and laſtly by nitrat of lead for the arſenic acid. By this method, the firſt arſeniat was found to conſiſt of

Oxyd of copper -	50
Arſenic acid -	27
Water - -	22
	99

The ſecond arſeniat afforded

Oxyd of copper -	35.
Arſenic acid -	39.5
Water - -	24.
	98.5

Arſenic, in the ſtate of white oxyd, combines with oxyd of copper into a pale green powder, called, from its diſcoverer, *Scheele's green.* It is prepared in the following manner: Diſſolve 24 ounces of ſulphat of copper in water, and heat the ſolution in a copper veſſel; alſo boil in another veſſel 24 ounces of pearlaſh, 11 ounces of white arſenic, and about 3 pints of water: when the whole is diſſolved, ſtrain each ſolution ſeparately through linen, and then add the arſenicated potaſh, little by little, to the ſulphat of copper, with conſtant ſtirring: an efferveſcence will take place, and then a green powder will be depoſited. When the whole is mixed, let it ſtand ſome hours, then ſeparate the precipitate by the filter, edulcorate it well with clear hot water, and dry it very gently in a warm room. The above quantity of ingredients will afford about 18½ ounces of the powder, which may be uſed as a pigment.

Phoſphat of copper may be prepared by adding phoſphat of ſoda to the nitrat, or any other readily ſoluble ſalt of copper, a blueiſh-green ſediment falls to the bottom, which dries to a powdery ſemi-cryſtalline maſs. A low red heat turns it brown, and drives off about 15.5 *per cent.* of water: there remains a phoſphat of copper, compoſed of 35 parts of phoſphoric acid, and 49.5 of oxyd of copper.

A ſtriking decompoſition of nitrat of copper alſo takes place, when a ſtick of freſh melted phoſphorus is immerſed in a ſolution of this ſalt, and expoſed to the light. By degrees the copper is precipitated on the ſurface of the phoſphorus, in the metallic ſalt, and in the form of cryſtalline grains.

All the ſalts of copper are decompoſed by the alkalin pruſſiats, and the reſult is a ſediment of a reddiſh-brown colour, which, by drying and expoſure to the air, acquires a dark chocolate hue. This pruſſiat of copper mixed well with oil, and has been employed with ſome ſucceſs as a pigment.

Tincture or infuſion of galls throws down from all cupreous ſolutions a precipitate of a dirty yellow colour.

Oxyd of copper is ſoluble in all the other acids, forming with them, however, ſalts little known, and of little importance: the predominating colour in all of them is green.

Of the alkalies, neither potaſh nor ſoda have any action on copper or its oxyds, except that already mentioned, of taking away from the hydrat its water of combination, and reducing it to black oxyd.

Ammonia has no action on metallic copper, but diſſolves its oxyds without difficulty. The uſual colour of this ſolution is a deep blue-purple. The moſt direct method of preparing it is by digeſting together liquid ammonia and any oxyd, or carbonated oxyd of copper: the liquor becomes blue almoſt immediately, and its colour deepens till ſaturation takes place. By ſlow and careful evaporation, blue ſilky cryſtals of ammoniuret of copper may be procured. This ſalt, by expoſure to the air, gradually loſes its alkali, and abſorbs carbonic acid, ſo that at length it is wholly converted into green carbonat. The *aqua ſapphirina* of pharmacy and ſurgery conſiſts, for the moſt part, of ammoniated copper, to which its colour is owing: it is made chiefly in two ways. The firſt is to digeſt in a glaſs veſſel quick-lime, muriat of ammonia, verdegris, and water; the lime decompoſes the muriat of ammonia, diſengaging the alkali, which, in its turn, decompoſes the verdegris, and diſſolves the oxyd of copper: hence the clear liquor conſiſts of ammoniated copper and muriat of lime. The ſecond method, where a weaker ſolution is wanted, is to employ lime-water inſtead of lime. Another way of producing ammoniated copper immediately is to ſuperſaturate with this acid any of the ſalts of copper, in conſequence of which the firſt portions of alkali decompoſe the cupreous ſalt, throwing down an oxyd, and the ſucceeding portions rediſſolve the oxyd, forming a dark-blue ſolution. As there is no other metal beſides copper and nickel which produces this particular colour, and as the latter of theſe metals is not common, the production of this beautiful tinge, by the addition of ammonia, may be conſidered as a very probable indication of the preſence of copper.

A ſingular circumſtance takes place with regard to ammoniated copper. If a bottle be filled with liquid ammonia, and a few clean copper filings be added, no ſolution enſues, as long as the bottle is kept cloſe corked. But if the bottle be opened for a while, and then ſhut again, a ſolution indeed of part of the copper takes place, but without any change of colour in the liquor: but when the bottle is again opened, the characteriſtic blue tinge appears firſt at the ſurface of the ſolution, and gradually ſpreads down to the bottom. If now a few more copper filings be added, and the bottle again corked, the ſolution will in a ſhort time again become colourleſs, and continue ſo till it is again expoſed to the air. The reaſon of theſe changes appears to be the following: copper requires ſome, but only a very ſmall quantity, of oxygen to be ſoluble in ammonia; and when in this loweſt ſtate of oxydation, it forms with ammonia a colourleſs ſolution, as it forms with muriatic acid a white ſub-muriat: but if this ſolution is expoſed to the air, the metal abſorbs oxygen, and is thus brought to that ſtate in which it tinges ammonia blue; being again ſhut up with a few copper filings, the oxygen is partly abſorbed by the recently added metal, and reduces the whole to the ſtate of white oxyd.

Many of the neutral ſalts, eſpecially the muriats, are capable of oxydating, and, in part, of diſſolving copper: this is eſpecially the caſe with muriat of ammonia, which, when made into a maſs with copper filings and a little water, and kept warm, preſently converts the copper into a green muriated oxyd.

Copper and ſulphur readily unite. If equal parts of copper filings and flowers of ſulphur are mixed and heated in a crucible, much of the ſulphur burns off; but the remainder melts into a blueiſh-black maſs, which is ſulphuret of copper. According to Prouſt, 100 parts of copper take up in this way 28 of ſulphur; ſo that the ſulphuret is compoſed of about 79 of metallic copper, and 21 of ſulphur. No oxygen appears to be preſent. This ſubſtance is more fuſible than copper, melting readily at a red heat. By roaſting in the open air, the ſulphur is expelled: the laſt portions, however, adhere with great obſtinacy. According to Dr. Thomſon, ſulphur and copper filings unite together, by being merely mixed together with or without water, and expoſed for a long time to the air.

Hydroſulphureted water, or any of the liquid hydroſulphurets, when added to the ſolutions of copper, produce a deep blueiſh-black precipitate, which is a hydroſulphuret of copper.

Phoſphorus is capable of intimate combination with copper. If 8 parts of this metal in filings, 8 of vitreous phoſphoric acid, and 1 of charcoal powder, are intimately mixed together, and then put into a crucible, and expoſed to an intenſe heat, the phoſphoric acid is decompoſed by the action of the charcoal, and the phoſphorus in part burns off, and in part unites with the copper, forming a hard, ſteel-grey, brittle alloy, capable of a high poliſh. A ſimpler way of preparing the ſame is to make copper filings red hot in a crucible, and project upon them ſmall pieces of phoſphorus, which combines with the metal, and melts down into a grey maſs, ſimilar to the former. One hundred parts of copper may thus be increaſed to about 120; but if this phoſphuret is kept for ſome time melted under charcoal powder, or melted glaſs, part of the phoſphorus burns off. When this exceſs is thus got rid of, the ingredients of the remaining phoſphuret appear to be in a ſtate of mutual ſaturation, no more phoſphorus being diſſipated by a continuation of the fuſion. In this ſtate the maſs appears to conſiſt of 92.3 of copper, and 7.7 of phoſphorus: it retains the grain and colour of ſteel, is ſuſceptible of a high poliſh, and does not readily tarniſh in the air, but is brittle. With a ſtill leſs proportion of phoſphorus, it becomes malleable, and of a yellowiſh-white colour. Phoſphuret of copper, if kept in fuſion, with free expoſure to the air, loſes gradually moſt of its phoſphorus, which burns away with the bright flame and odour peculiar to this ſubſtance.

The fixed oils, when kept long in contact with copper, oxydate it, and diſſolve a portion, by which they acquire a green colour.

The uſes of copper, in its various ſtates, are ſo numerous and important, as to be ſcarcely inferior to thoſe of iron. All the ſalts of copper are more or leſs poiſonous, producing violent nauſea, with ſevere pain and inflammation of the inteſtinal canal. Yet from the ſudden vomiting that they excite, a large doſe may be given with ſafety; and this is ſometimes done, when there is an immediate neceſſity of emptying the ſtomach. Copper, however, is very little uſed medicinally in any form.

§ 5. *Alloys of Copper.*

The alloys of copper are, upon the whole, of more importance than thoſe of any other metal: we ſhall, therefore, treat of them with ſome minuteneſs.

Copper with gold and ſilver.

Copper, when added in ſmall quantity to either of theſe metals, greatly increaſes their hardneſs, without materially debaſing their colour or malleability: hence it has been generally adopted as the alloy for that portion of the precious metals which is employed with current coin, and for plate.

Copper with arſenic.

On account of the volatility of arſenic ſome precautions are required in the preparation of this alloy. The beſt way, upon the whole, is to melt ſome copper in rather a large crucible, and then to wrap up in paper ſome reguline arſenic, or white arſenic, either with or without a mixture of charcoal powder, and to immerſe the paper, with its contents, in the melted copper, either by means of a pair of long tongs, or by ramming the paper into a ſmall crucible, and then inverting the crucible in the fluid metal. The arſenic preſently riſes through the copper in denſe white fumes, and is in a great part diſſipated; a portion however is retained by the copper, and by repeating the proceſs once or twice more, the alloy will be fully ſaturated with arſenic.

This alloy is of a ſilvery white colour and a cloſe texture; it is however very brittle, and, in proportion to the perfect whiteneſs of its colour, liable to tarniſh in the air. As ſoon as it is brought to fuſion the arſenic begins to eſcape, and the copper regains its malleability: the laſt portions however of arſenic are not driven off even by long continued heat, and although the copper regains its malleability, its colour remains of a dingy yellow.

Vauquelin has diſcovered that if to an alloy of copper and ſilver, in equal proportions (the colour of which is a pale yellow), there be added 2 *per cent.* of arſenic, the reſult is a perfectly white ductile and malleable alloy. If this latter ingredient exceeds 5 *per cent.* the alloy begins to be brittle.

Copper with iron.

Theſe two metals only unite when the former of them is greatly in exceſs. The reſult is a hard, grey, and ſomewhat brittle alloy. According to Mr. Keir, the *tutenag* of the Chineſe is a white alloy of copper, zinc, and iron: it is hard, tough, and ſufficiently malleable to be wrought into candleſticks and various other articles of domeſtic furniture, which take a high poliſh, and are ſcarcely to be diſtinguiſhed from ſilver. The inferior ſort of tutenag has, however, a very perceptible braſſy tinge.

According to Dizé, the alloy of iron and copper only ceaſes to be acted on by the magnet, when the proportion of the former is leſs than $\frac{1}{16}$ of the whole maſs. Iron is much inferior in its power of whitening copper to tin or even to arſenic.

Copper with lead.

Theſe metals unite, to appearance, very intimately by fuſion; but when a maſs of this alloy is expoſed to a very low red heat, the greater part of the lead, with a ſmall portion of copper, ſweats out, leaving the reſt in a porous honeycombed ſtate. When the copper holds a little ſilver, the lead carries the latter out with it: this proceſs is called *eliquation,* and will be treated of more at large in the article Silver. Copper, with about a fourth of its weight of lead, forms *pot-metal.* The Roman pot-metal was compoſed, according to Pliny, of 100 parts copper, 2 lead, and 2 tin. The ſame ingredients, but with larger proportions of the two latter, were the materials of many of the ancient Greek and Sicilian coins, as appears from analyſes of them by Klaproth.

Copper with zinc.

Copper, when nearly ſaturated with zinc, that is, when the latter amounts to about one-fourth of the alloy, forms *braſs,* of which an account has been already given. With a ſmaller proportion of zinc, the colour of the alloy approaches more nearly to that of gold, and its malleability increaſes. Mixtures, chiefly of theſe two metals, are employed to form a variety of gold coloured alloys, known by the names of *tombac, Manheim* or *Dutch gold, tinſel, ſimilor, prince Rupert's metal, pinchbeck,* &c. the preciſe compoſition of which varies according to the fancy or experience of different artiſts. The Dutch gold may be beaten into extremely fine leaves, which when freſh are a cheap and good imitation of gold leaf; but they tarniſh very ſoon. The mixture may be made either by melting together copper and zinc, or copper and braſs. In either caſe the copper ſhould be melted firſt, and the other ingredient added afterwards: being then carefully ſtirred together with a ſtick, the alloy is to be poured out into proper moulds without loſs of time, leſt the zinc ſhould burn off.

A fine malleable tombac may be made with 16 parts of copper, one of zinc, and one of tin; if a larger proportion of this latter is added, the alloy becomes harder and brittle. Several Roman coins ſtruck, during the firſt century of the emperors, have been analyzed by Klaproth, and appear to conſiſt, ſome of nearly pure copper, others of copper, with from a fifth to a ſixth of zinc. A little tin and lead were found in ſome, but in ſuch ſmall proportions as to appear only an accidental impurity.

Copper with tin.

The alloy of copper and tin are extremely important in the arts, and curious as chemical mixtures. Tin added to copper makes it more fuſible, leſs liable to ruſt or be corroded by the air and other common ſubſtances, harder, denſer, and more ſonorous. In theſe reſpects the alloy has a real advantage over unmixed copper; but this is in many caſes more than counterbalanced by the great brittleneſs which even a moderate portion of tin imparts, and which is a ſingular circumſtance, conſidering how very malleable both metals are before mixture.

The ſenſible qualities of the different mixtures of theſe two metals are the following: Copper, alloyed with from one to five *per cent.* of tin, is much harder than before; its colour is yellow, with a caſt of red, and its fracture is granular: it is ſtill conſiderably malleable. This appears to be the uſual compoſition of many of the ancient edged tools and weapons before the uſe of iron; whence it appears that the ancients did not poſſeſs (as has often been ſuppoſed) any peculiar art of hardening pure copper, otherwiſe than by mixture. An alloy in which the tin is from $\frac{1}{10}$ to $\frac{1}{5}$ of the whole is hard, brittle; but ſtill a little malleable, cloſe-grained, and yellowiſh-white. When the tin is as much as $\frac{1}{6}$ of the maſs, it is entirely brittle, and continues ſo in every higher proportion. The yellowneſs of the alloy is not entirely loſt till the tin amounts to $\frac{7}{25}$ of the whole.

Copper (or ſometimes copper with a little zinc) alloyed with as much tin as will make from about $\frac{1}{10}$ to $\frac{1}{5}$ of the whole, forms an alloy which is principally employed for bells, braſs cannon (ſo called), bronze ſtatues, and various other purpoſes. Hence it is called *bronze* or *bell-metal,* and is excellently fitted for the uſes to which it is applied by its hardneſs, denſity, ſonorouſneſs, and fuſibility. For cannon a lower proportion of tin is commonly uſed. According to Dr. Watſon, the metal employed at Woolwich conſiſts of 100 parts of copper, and from 8 to 12 of tin; hence it retains ſome little malleability, and therefore is tougher than it would be with a larger portion of tin. A common alloy for bell-metal is 80 of copper and 20 of tin; ſome artiſts add to theſe ingredients zinc, antimony, and ſilver, in ſmall proportions, all of which certainly improve the ſonorouſneſs of the compound.

When in an alloy of copper and tin, the latter metal amounts to about ⅓ of the maſs, the reſult is a beautifully white alloy, with a luſtre almoſt equal to that of mercury; extremely hard, very cloſe-grained, and perfectly brittle. It takes an exquiſite poliſh, which well adapts it for the reflection of light for all optical purpoſes. It is called *ſpeculum metal*, and, beſides the above ingredients, generally contains a little arſenic, zinc, or ſilver. The application of an alloy, ſimilar to the above, to the conſtruction of mirrors, is of great antiquity, being mentioned by Pliny. From the actual analyſis, by Klaproth, of a portion of an ancient ſpeculum, it appeared to conſiſt of

Copper	62
Tin	32
Lead	8
	102

Of theſe ingredients the laſt is conſidered by Klaproth, with high probability, as only a caſual adulteration of the tin.

When the amount of the tin exceeds that of the copper, the alloy begins to loſe its ſplendid whiteneſs, and acquires a blueiſh-grey hue; its texture likewiſe becomes rough-grained, and, as it were, rotten and incapable of receiving a poliſh.

A perfect ſpeculum metal ſhould be quite white, without ſhewing any caſt of yellow when poliſhed, not very liable to tarniſh, quite free from pores, even when examined by a lens, of a certain coherence or toughneſs to bear the grinder, and, for the convenience of working, as ſoft as may be conſiſtent with the other requiſites.

Mr. Mudge, whoſe ſpecula were celebrated for their goodneſs, obſerves, that the extreme of whiteneſs is given by 32 parts of copper and 16 of tin, but this compound is too hard and brittle; 32 parts of copper with 14½ of tin form an alloy quite white, and as hard as can be wrought. In order that the metal ſhould turn out free from pores, it ought to be twice fuſed, once for mixture of the ingredients, and afterwards, with as little heat as poſſible, for caſting.

The following obſervations on the ſame ſubject are extracted from an elaborate paper by Mr. Edwards, publiſhed in the Nautical Almanack for 1787.

The quality of the copper ſhould firſt be tried by adding ſucceſſively from ſo much ſhort of half of its weight of tin, that the mixture proves a little yellow, to the full half of tin, and by compariſon of the various ſamples aſcertaining the *maximum* of whiteneſs. When this is found, take 32 parts of copper, melt it, then add one part of braſs and the ſame of ſilver, with a little black flux to cover the ſurface; when theſe are melted ſtir them together with a wooden rod, and pour in from 15 to 16 parts of tin (as aſcertained by previous experiment) fuſed in a ſeparate crucible, at a low heat; then ſtir the mixture again, and immediately pour it into cold water. Re-melt, with as little heat as poſſible, the alloy thus formed, and for every 16 parts take one of white arſenic, wrap it in paper, thruſt the packet to the bottom of the fluid metal with a wooden rod, and ſtir it well as long as any arſenical vapours ariſe; when theſe ceaſe pour the metal into a mould of ſand, and as ſoon as it has ſolidified lay it in a pot full of very hot embers, and cool it very ſlowly: unleſs this precaution is particularly obſerved, the metal will fly in pieces when cold, or will ſplit in the poliſhing.

The braſs, the ſilver, and the arſenic in this compoſition appear to have their diſtinct uſe; the braſs makes the mixture tougher, and ſomewhat ſoftiſh, the ſilver improves its colour, and the arſenic renders the texture remarkably finer, cloſer, and leſs porous; a larger proportion of this however would make the metal liable to tarniſh

Sir J. Newton's ſpecula were compoſed of 6 parts of copper, 2 tin, and 1 arſenic; they are upon the whole very good; but after being poliſhed exhibit a rather yellow caſt.

The other alloys of copper are not of much importance, and will be found under the reſpective metals to which they belong.

Copper, *white*, a kind of metal white as ſilver; frequently brought from China, and ſuppoſed by many to be natural. But it is only an allay of copper, zinc, and arſenic, in certain proportions. It is made with difficulty, becauſe of the volatility of the two ſemi-metals; and, as its quality is noxious, it is not much uſed.

Copper, in *Military Affairs.* No other metal is allowed in magazines, or for barrels of gun-powder.

Copper, in *Calico-Printing*, a veſſel in which the operations of dyeing, dunging, rinſing, &c. are performed, and which derives its name from the material it is generally conſtructed of. As theſe veſſels are uſed indifferently for any of the above purpoſes, their ſize, form, and arrangement, are generally the ſame, and vary little throughout the whole kingdom. They are always circular, from 4½ to 5 feet diameter at the top; 3½ to four feet deep, and about the ſame in width, acroſs the bottom, which is the thickeſt and ſtouteſt part of the veſſel. This circular form, though in general uſe, is perhaps the worſt that could have been deviſed for the purpoſe of calico-printing. It is no doubt the firſt that was employed, and has advantages in point of ſolidity of form, and eaſe of tranſportation from one place to another, over any other. For the purpoſe of dyeing, however, or any operations where goods are kept for a long time at a boiling heat, and turned over the winch, it is the moſt inconvenient that could have been adopted.

In a veſſel of this ſize and form, it is cuſtomary to dye from ſix to twelve pieces of twenty-eight yards each, at one operation. The goods are diſpoſed either in two lengths of four or ſix over the winch; or, when quick turning is neceſſary, in one length only, in which caſe, ſix pieces, or at moſt eight, are diſpoſed equally over the whole ſurface of the winch. In this latter caſe, the inconvenience of the circular form is particularly felt. It is evident that when ſix or more pieces are crowded upon a winch, thoſe which are at the extremities will have little or no ſpace in which to float, without diſturbing thoſe which are nearer the centre; whilſt, on the other hand, thoſe which are in the middle will have more than ſufficient, and will float in the copper, ſcarcely ever touching its ſides. In conſequence of this, the pieces at the extremities of the winch, being crowded, will preſs along the ſides of the copper, and thus be expoſed to greater heat and hazard of copper-marking, than thoſe which are in the middle. Their diſpoſition on the winch will alſo be deranged, and the copper-man, with all his care and attention, will be unable to preſerve that order and regularity in the diſtribution of their folds, ſo eſſentially requiſite in good dyeing. When the copper is in a ſtate of ebullition, theſe evils increaſe, and it rarely happens that the moſt experienced dyer can keep his goods diſengaged, or prevent their getting completely faſtened, when he has two lengths of ſix over the winch, and keeps them twenty or thirty minutes at an actual boil.

By adopting a ſquare, or, what is ſtill better, an oblong veſſel of the ſame capacity as the former, theſe inconveniences are in a great meaſure done away; the goods have all equal ſpace to float in, are equally removed from the centre and ſides of the veſſel, and preſerve their order and diſpoſition on the winch, even in a ſtate of ebullition, with eaſe, certainty, and comparatively trifling attention.

Dye-coppers are generally ſet up in brick work, with each their ſeparate and diſtinct fire-place, chimney, &c.

The ſame principles apply to the heating of theſe veſſels as to all other boilers, but we need not enter here upon a ſubject which will be more fully treated of in another part of this work. The recent improvements in the application of ſteam, as a vehicle of heat, are however of ſuch importance, and have at this moment excited ſuch general intereſt amongſt dyers, and calico-printers, as to claim a ſhort notice in this place.

Mr Gott, of Leeds, was the firſt who applied ſteam in the large way, to the heating of dye-coppers, and the ſucceſs of his experiment was ſo complete, as to induce many others to follow his example. This mode, which is the ſimpleſt and moſt economical that can be employed, conſiſts in throwing the ſteam directly into the dyeing veſſel. One ſteam boiler, ſituated at the extremity of the building, ſupplies his numerous coppers which are diſpoſed promiſcuouſly about the dye-houſe, unincumbered with fire-places, aſh-pits, chimneys, &c. and ſimply ſurrounded with a caſing of brick, to ſupport the copper, and confine the heat.

The ſteam is conveyed in horizontal pipes, carried along the ceiling of the dye-houſe, from which deſcend vertical tubes of from $\frac{3}{4}$ of an inch to $2\frac{1}{2}$ inches diameter, according to the ſize of the copper they belong to. Theſe ſteam tubes all paſs down on the outſide of their coppers, and enter them horizontally at the level of their bottoms; and are furniſhed with braſs cocks for regulating the admiſſion of the ſteam, or entirely interrupting it when the copper is not wanted.

The rapidity with which theſe coppers are heated, is truly aſtoniſhing. One of the largeſt in Mr. Gott's dye-houſe of 1800 gallons capacity, according to count Rumford, was brought to the boiling point in half an hour. The ſaving of fuel, though in general over-rated, is another advantage gained by this mode of applying heat. Mr. Gott ſtates this at two-thirds of the quantity conſumed when the coppers are heated by ſeparate fire-places; but this is evidently too much. The ſaving conſiſts in the application of fire to one veſſel only of large dimenſions, inſtead of to a number of ſmall ones; and though this is certainly accompliſhed with leſs expence of fuel, yet, if the fire has been well and properly applied in the latter caſe, the ſaving will amount nearer to one-third than to two.

The burning of the copper ſides and bottoms, when heated by a naked fire, is a heavy expence in a large eſtabliſhment, and often a ſource of ſerious inconvenience. By the application of ſteam, this is entirely done away, and even copper veſſels themſelves, for many operations, rendered wholly unneceſſary. Wooden veſſels have been ſubſtituted, with great advantage, in their ſtead, and when the uſe of copper cannot be diſpenſed with, it may be employed in thin ſheets, ſupported by a frame work of brick or wood. Important as theſe advantages are in an economical point of view, the ſyſtem of ſteam-heating has, if poſſible, ſtill more powerful recommendations. The eaſe, elegance, and regularity, with which the heat can be tranſmitted by a ſteam tube, are of themſelves ſufficient to entitle it to decided preference.

By the adjuſtment of the ſteam-cock, the rate of heating is ſo regulated, that the copper may be brought to the boiling point in any given time, with an exactneſs as well as celerity, unattainable by the other mode. The heat may in an inſtant be withdrawn, or rendered ſtationary at any fixed point, by a ſingle turn of the cock, the firſt of which is impracticable, and the latter extremely difficult, when the coppers are heated by ſeparate fire-places. The ſides and bottom of a dyeing copper, expoſed to a ſtrong and naked fire, are always much hotter than the dye-liquor, and occaſion copper-marks and unevenneſs in the goods, in ſome caſes difficult to avoid. This inconvenience is entirely removed by the uſe of ſteam, ſince the dyeing-veſſel deriving all its heat from the heated liquor within it, can never, it is evident, acquire a higher temperature.

The ſucceſs of Mr. Gott's experiments was ſuch, that many of his neighbours, at firſt much prejudiced againſt it, immediately adopted the plan. With a liberality worthy of imitation, his dye-houſe was open to all inquirers; and ſuch was the intereſt excited by this new and extraordinary mode of applying heat, that experiments were immediately inſtituted in different parts of the country, with a view of extending this improvement to other branches of the art of dyeing. Mr. Gott had proved and eſtabliſhed the practice as far as the dyeing of woollen goods was concerned, and little more remained to be done; in its application to calico-printing and the dyeing of lighter goods, however, difficulties occurred, of ſuch a nature, as wholly to diſcourage many whoſe trials were made in a haſty ill-concerted manner, and conſiderably to embarraſs thoſe whoſe experiments were conducted with greater ſkill and patience.

The great, and only well-founded, objection aroſe from the agitation into which the water was thrown when it approached the boiling point, by which the goods were entangled and faſtened, much more than in the ordinary mode. This inconvenience was not felt in Mr. Gott's dye-houſe, where the goods being woollen, and of much greater weight and ſubſtance, were leſs liable to be toſſed about by the aſcending currents from the ſteam-tubes than the thin and lighter goods manufactured from cotton. The evil was often increaſed by want of ſufficient attention to the regulation of the ſteam-cock; thrice the quantity of ſteam neceſſary to maintain the copper at the boiling point being admitted, which, retaining its elaſtic form at that temperature, paſſed through the copper uncondenſed, and threw the goods into the greateſt confuſion.

To diminiſh the agitation, it has been found neceſſary to break the force of the current, by introducing the ſteam in ſmall quantities, through two or three different openings, or in ſome caſes by introducing a falſe bottom, pierced full of holes, between the goods and the end of the ſteam-tube; by this means, and ſtill more by carefully admitting only the neceſſary quantity of ſteam, the agitation may be ſo far reduced, as to be no longer troubleſome.

The accumulation of condenſed water in the dye-copper, is a neceſſary conſequence of this mode of applying ſteam, and cannot be avoided. Where it is an object to diminiſh this as much as poſſible, it may be accompliſhed by uſing ſtrong, or which is the ſame thing, very hot ſteam; but it does not appear that any great inconvenience reſults from this trifling increaſe, which ceaſes when the copper has attained the boiling point, due allowance being made for it in the firſt inſtance, when the veſſel is filled with cold water.

When ſtrong ſteam is rapidly thrown into a veſſel filled with cold water, the condenſation is inſtantaneous, and attended with a loud noiſe, and violent ſhock.

We have ſeen a ſtone ciſtern of large dimenſions, and firm joinings, nearly ſhaken to pieces by the incautious admiſſion of ſteam, and many of the early experimenters complained that their coppers were nearly knocked to pieces, and that few would hold water after being heated once or twice.

This inconvenience may be corrected by ſtopping the end of the ſteam tube, and piercing the ſides full of ſmall holes, or, which is ſtill better, by turning up the end of the pipe, and fixing a valve in it. In either caſe the ſteam is emitted through the openings in ſtreamlets, or ſheets of ſmall volume, whoſe condenſation is attended with trifling noiſe, and little agitation of the veſſel. Several dye-houſes in Lancaſhire and Cheſhire have been fitted up on theſe principles, and, the coppers, thus heated, are uſed, with few exceptions, for every purpoſe of calico-printing.

Mr. Gott, as we have before ſtated, was the firſt who introduced this improvement on a large ſcale, the idea of which, count Rumford informs us, was derived from the peruſal of his ſeventh Eſſay. We know not what ſhare the count's publication might have in deciding the trial, but the idea of heating water by ſteam had occurred long before that time to Mr. Watt; and, if we miſtake not, a warm bath at Soho had been heated in this way, and ſeen by Mr. Gott, and many others, to whom the idea of its application to more uſeful purpoſes had naturally occurred.

For ſome few purpoſes we believe this mode of applying heat, by throwing ſteam directly into the dye-copper, is leſs advantageous. When goods, for example, are kept a long time at a low heat and never boiled, the accumulation of condenſed water, in this caſe, continues to the end of the operation, and weakens conſiderably the effect of the dye. All the advantages of this mode may, however, be obtained without any of the inconveniences we have before alluded to, by ſurrounding the dyeing-veſſel with a caſing of caſt iron, and throwing the ſteam in between this and the copper. The heat in this caſe is tranſmitted through the ſides of the copper, as in the ordinary mode of heating by a naked fire, and the condenſed water is carried off from the caſing either by a reverſed ſyphon, eight or nine feet long, or, when the ſituation will not admit of this, by a floating valve. In this way the noiſe and ſhock, from the rapid condenſation of ſteam in cold water, the agitation in the dye-copper, and the condenſed water, are all completely got rid of. The apparatus is, however, leſs ſimple and much more expenſive than the former.

A ſtrong ſteam is neceſſary to produce the boiling heat in a dye-copper cooled by the continued expoſure of the goods on the winch, and the veſſel and joints muſt be ſound and ſtrong to ſupport this preſſure. Both modes have their advantages, and will, we have little doubt, in a few years entirely ſuperſede the ordinary mode of heating by ſeparate fire places.

COPPER *mark*, is a ſtain, diſcolouration, and unevenneſs in dyed goods, cauſed by contact with the ſides of a *hot* or *dirty* copper, during the operation of dyeing. In the ordinary mode of heating, as has been obſerved in the foregoing article, the bottom and ſides of a dyeing-veſſel, when expoſed to a ſtrong and naked fire, are much hotter than the dye-liquor. When this is the caſe, and the colours pale and delicate, ſimple contact with the hot copper is ſufficient to cauſe unevenneſs, either by affecting the hue by the exceſs of heat, or enabling the mordant to combine with an extra portion of colouring matter. This inconvenience is in general remedied by placing a baſket of wicker work within the copper, which prevents the goods from touching the ſides of the veſſel; it is ſtill more completely guarded againſt by heating the copper with ſteam, in the manner already deſcribed.

The ſides of a copper will often occaſion marks or ſtains when the veſſel has been negligently waſhed out, and eſpecially when it has not been uſed for ſome time. A dye-copper not in uſe ſhould always remain filled with clean water. It prevents the formation of a ruſt on its ſurface, which ſimple waſhing will not remove, and which acts as a mordant, and fixes the dye whenever it touches the cloth.

COPPER *Iſland*, in *Geography*, otherwiſe called MEDNOI *Oſtroff*, *i.e.* Mednoi iſland, lies in the ſea of Kamtſchatka, which ſeparates the two continents of Aſia and America. It takes its name from large maſſes of native copper found upon the beach; and as it lies full in ſight of Beering's iſle, it was eaſily and ſpeedily diſcovered by thoſe who ſucceeded Beering. Theſe two uninhabited ſpots, to which the ſea-otters and other marine animals were accuſtomed to reſort in great numbers, and which were firſt viſited in 1745, were for ſome time the only iſlands that were known, until a ſcarcity of land and ſea-animals, whoſe numbers were greatly diminiſhed by the Ruſſian hunters, occaſioned other expeditions. Beſides the native copper which is found on the coaſt of this iſland, the true right camphor-wood, and another ſort of wood, very white, ſoft, and ſweet-ſcented, are found among the floating bodies which the ſea caſts upon the ſhore. The copper lies on the ſhore in ſuch abundance, that many ſhips might be loaden with it; and an Indian trader might make a profitable voyage from thence to China, where this metal is in high demand. This copper is moſtly in a metallic or malleable ſtate, and many pieces of it ſeem as if they had been formerly in fuſion. The iſland is not high, but has many hillocks, each of which has the appearance of having formerly been the funnel of a volcano. This iſland, as well as the others in its vicinity, are ſubject to frequent and violent earthquakes, and abound in ſulphur. (Coxe's Ruſſian Diſcoveries.) From the account in captain Cook's Third Voyage (vol. iii. p. 347.) we learn, that, on Mednoi and Beering's iſland, ſcarcely a ſea-otter is now to be found; though it appears from Muller, that in his time they were exceedingly plentiful.

COPPER-*Plates for Engraving*. We are favoured with the following account of the method of preparing copper-plates, as practiſed at preſent in London, by Mr. Harris, ſon-in-law and ſucceſſor to Mr. Whittow of Shoe-lane.

A ſheet of copper muſt be choſen as free as poſſible from flaws, and of a ſomewhat greater thickneſs than the finiſhed plate is intended to be: it is then to be ſcraped all over with a *ſcraper*, in ſhape ſomething like the head of a ſpear, and fixed in a handle long enough to go under the arm, the other hand holding the tool near the cutting part. When it has been perfectly freed from the outward cruſt, ſcales, or ruſt, it muſt be carefully examined to ſee if there are any holes or flaws in it; if there are (which is almoſt always the caſe), they muſt be ſcooped out by a tool called a *ſcooper*. This being done, it is next to be well and regularly hammered all over on an anvil, of a conſiderable degree of convexity, in order to harden it; and afterwards on a broad and nearly flat anvil, to flatten and planiſh it. After this has been performed, it is to be cut to the ſize wanted, and the edges a little chamfered or bevilled, and is now to be ſtoned, that is, rubbed all over with a faſt cutting, but not very coarſe, grit ſtone, care being taken to uſe a great quantity of water, to float off the particles mutually abraded from the copper and ſtone. When it is judged that all the marks of the ſcooper

and

nad hammer are rubbed out, a ſtone of a fine grit is to be uſed in the ſame manner, and after this a third.

The two firſt-mentioned ſtones are ſold at the ironmongers in London, under the name of "Carpenters' ſtone;" the beſt kind are brought principally from the coal fields in the neighbourhood of Bilſton in Staffordſhire. The ſtone laſt uſed is called "Water of Aye ſtone," and brought from Dumfriesſhire. All the three kinds contain a conſiderable quantity of argil in their compoſition. Lately, a very fine grained argillaceous grit, brought from the neighbourhood of Sheffield, has been uſed inſtead of the Bilſton ſtone.

After the operation of ſtoning has been performed, the plate is to be "coaled." This is done by rubbing it firſt with charcoal of birch-wood, or alder, and water, and then with charcoal of willow: the latter gives the finer poliſh, particularly if oil inſtead of water be uſed. Sometimes the plates are finiſhed by burniſhing, but this is not now often done.

The charcoal is not prepared by the copper-plate makers, but is procured from the dealers in that article by the workmen, who take a plate of copper, and by trial diſcover which pieces are fit for their purpoſe.

COPPER-*Plate Printing.* See *Rolling-preſs* PRINTING.

COPPER-*Plate Work*, in *Calico-Printing.* The application of engraving has given birth to a new and important branch of calico-printing. It firſt introduced thoſe machines whoſe ſubſequent improvement has ſo much contributed to the perfection of the art, and which ſurpaſs the ordinary mode of block-printing, not only in neatneſs, accuracy, and preciſion, but ſtill more in the economy and activity with which the labour is performed.

Theſe machines are of two kinds, the flat preſs, and the rolling or cylinder preſs.

The flat preſs, in its original form, was merely a modification, conſiderably enlarged, of the preſs for ornamental prints or engravings; to which was added a contrivance for *joining*, with accuracy, the numerous and ſucceſſive impreſſions neceſſary to cover a piece of cloth. It was confined at firſt to one colour, but later improvements have extended it to two and even three. The ſingle colour preſſes are, however, principally in uſe.

The cylinder, or rolling-preſs, is of later invention, and differs from the former chiefly in the ſubſtitution of an engraved cylinder for a flat plate. With the latter the cloth is printed by *ſucceſſive* impreſſions, in which the accuracy of the joining is of great importance: in the rolling-preſs, the revolution of the engraved cylinder forms one *continued* impreſſion, from one end of the piece to the other, in which there are conſequently no joinings. This is a great advantage, eſpecially in ſmall and delicate patterns, where a variation of a hair's breadth in the joint is readily perceived; but its great ſuperiority over the flat preſs conſiſts in the economy of time and labour. With a well-conſtructed cylinder-preſs, and proper arrangements for accelerating the work, one man and a boy will print 200 pieces, of 28 yards each, in the ſame time that a flat preſs man will print 12 pieces, or a block printer 8; that is, in one day. They are conſtructed to work one, two, and even three colours, but are generally confined to one; the difficulty and delay in adjuſting the ſeveral cylinders to each other, when more than one colour is worked, counteracting, in great meaſure, the chief advantage of the machine. For a deſcription of theſe preſſes, and the mode of working them, ſee PRESS. See alſo the article ENGRAVING.

COPPERAS, a term employed popularly and by the old chemiſts as ſynonymous with vitriol. Of Copperas there are three kinds, the *Green* or Sulphat of IRON, the *Blue* or Sulphat of COPPER, and the *White* or Sulphat of ZINC, which ſee.

The former is diſtinguiſhed in common by a variety of names, as Martial vitriol and Roman vitriol, but moſt commonly by the names of green copperas or green vitriol. It is ſeldom made by the direct combination of ſulphuric acid with the oxyd of iron, which conſtitutes this ſubſtance, except for the purpoſes of experiment in the laboratory of the chemiſt. The common, as well as the refined, is manufactured on the large ſcale, as an article of commerce, in the neighbourhood of collieries, and is in ſome inſtances found native. It was known to the ancients, as Pliny informs us, (N. H. l. xxiv. c. 12.) and denominated by them Miſy, Sory, or Calcanthum. Concentrated ſulphuric acid has ſcarcely any action on iron; when it is heated the acid is decompoſed, part of its oxygen combines with the iron and ſulphurous acid gas is evolved, but when diluted ſulphuric acid is added to iron filings, a violent efferveſcence takes place, and hydrogen gas is diſengaged; in this proceſs the water, with which the acid is diluted, is decompoſed, the oxygen of which combines with the iron; and converts it into an oxyde; whilſt the hydrogen eſcapes in the form of gas, the ſolution is of a green colour, and by evaporation affords cryſtals of ſulphat of iron which are tranſparent, of a fine green colour, in the form of rhomboidal priſms, having an acrid aſtringent taſte; this ſalt almoſt always reddens vegetable blues, is very ſoluble; two parts of cold water, or leſs than its weight of boiling water, being ſufficient for its ſolution.

The mode of preparing it, as an article of commerce, is purſued principally, as before obſerved, in the neighbourhood of coal pits, in many of which a ſubſtance is found in great abundance, which, though injurious to the coal, forms nevertheleſs a valuable material as being the baſis of copperas, known by the name of pyrites or braſſes; theſe are carefully ſeparated from the coal, and the expence which this labour occaſions, is amply repaid by the produce of the manufacture; the proceſs is at once ſimple and economical, and does honour to the intelligence of thoſe who firſt ſuggeſted it. A large area of ground is incloſed, to which a gentle but ſenſible declivity is given; the ſurface is made quite equal, and covered with an unctuous clay, which is every way extended and ſmoothed, as if plaiſtered, in order to prevent the water from filtrating into the earth; at the ſame time a furrow is formed in the midſt of the area, for collecting all the water in one point, and conveying it to a reſervoir; the area being thus prepared, the pyrites are ſpread all over its ſurface, in layers one above another to the height of ſeveral feet; care is taken in placing the different pieces to leave intervals for the admiſſion of the air: now as theſe pyrites contain iron in combination with ſulphur, when they are expoſed to the alternate action of water and the atmoſphere; they undergo a material change, the water is decompoſed, one of its conſtituent parts, namely, the oxygen, combines with the ſulphur, and forms ſulphuric acid, or oil of vitriol; the hydrogen eſcapes into the atmoſphere, by this means a ſaline powdery maſs is formed, the taſte of which is auſtere and ſtyptic; the decompoſition is materially aſſiſted by occaſionally turning the pyrites with rakes having long iron teeth, like thoſe uſed in Glaſgow and neighbouring places, for ſtirring the boiling ingredients of the glue maker, by which means new ſurfaces are preſented to the action of the atmoſphere. In ſummer, when it is long dry weather, it is neceſſary to ſprinkle the braſſes frequently with water, to waſh away the ſalt which is already formed, and alſo to produce that humid warmth which accelerates ſtill further the decompoſition; gentle ſhowers are therefore excellent for bringing forward this part of the operation. The water loaded with vitriol, finding a clay bottom, which prevents its loſing itſelf in the earth, flows down the inclined plane, and falls into the reſervoir, in which a quantity of old iron is placed, purchaſed principally from the ſmiths and the coopers, as their refuſe. It is well known that, during the decompoſition of the pyrites, more ſulphuric acid is produced, than the iron contained in them will neutralize; the refuſe iron is therefore placed in the reſervoir and the liquor run upon it, in order to combine with the ſuperabundant acid. The natural evaporation which takes place here adds to its ſtrength, and, when it is conceived to be properly prepared, it is drawn off into a ſecond reſervoir, attached to the workhouſes of the manufactory; from thence it paſſes into leaden boilers, where it is made to boil and evaporate by a large fire, formed of the moſt inferior kind of coal; when the liquor is brought to a proper ſtate, it is run out by ſyphons, or drawn out by pumps, into long wooden troughs, where it is cryſtallized by the operation of cold, the cryſtals attaching themſelves to twigs and branches of trees, which are ſuſpended in the troughs for the purpoſe by being hung over pieces of wood, ſeveral of which are laid acroſs the top of each trough; from theſe branches they are taken and dried, and are then ready for the market.

Refined Copperas is an improvement in the mode of preparing copperas, and was diſcovered by the late Mr. Thomas Barnes, of Walker, near Newcaſtle-upon-Tyne, a coal viewer of the firſt eminence in that neighbourhood; this is effected by merely evaporating ſtill further than in the common mode the water of cryſtallization, and attending throughout the whole proceſs to a little more cleanlineſs and exactneſs in the manipulations.

Two or three men are ſufficient to manage a manufactory of either kind, and to produce a great quantity of the articles; conſidering which, and the rate it ſells at, at preſent (1806) from 10 to 14*l.* *per* ton, it ranks with the moſt beneficial manufactories.

Amongſt the few places in which this ſalt is found native, we ſhall only notice that at Hurlet near Paiſley, in a ſtratum of ſchiſtus, ſunk through in 1786 to a ſeam of coal, pyrites abound ſo much, that native copperas is ſometimes found; it does not in this inſtance lie in any regular bed, but is interſperſed through the ſtratum, and ſeparated from the coal by the workmen. Theſe works were eſtabliſhed in 1753 by a company of gentlemen from Liverpool, for the ſole purpoſe of making alum, but finding both pyrites and native copperas, they added the manufacture of that article alſo.

COPPERAS *ſtone*. See PYRITES.

COPPER-*Mine*, in *Geography*, a large river in the central parts of N. America, reckoned to be the moſt northern in the American continent. Purſuing a northern courſe, it falls into the ſea in N. lat. 72°, and W. long. 120°, according to Mr. Hearne, and 113° according to the poſition aſſigned it by Mr. Arrowſmith. In 1771 Mr. Hearne arrived at this river, who found that it flows into the Arctic ocean, or rather, as he intimates in the preface to his book, publiſhed in 1795, into an inland ſea like that of Hudſon. From his journies, performed in 1769—1772, we may infer, with a great degree of confidence, that the ſearch after a N. W. paſſage is not likely to ſucceed. Upon his arrival at the copper river, on the 14th of July 1771, the ſavages who attended him murdered, in a ſhocking manner, ſome Iſkimo families. On the 17th he was within ſight of the ſea; and commencing his ſurvey, purſued it to the mouth of the river, which he found ſo full of ſhoals and falls, that it was not navigable even for a boat, and that it emptied itſelf into the ſea over a ridge or bar. As the tide was out, he perceived by marks on the edge of the ice, that it flowed about 12 or 14 feet, and of courſe could reach but a little way within the river's mouth, and he found the water perfectly freſh. He concluded that this river ran into the ſea, or ſome branch of it, by the quantity of whalebone and ſeal-ſkins which the Iſkimos, (or Eſquimaux) had at their huts, and alſo by the number of ſeals which he ſaw on the ice. It has been ſuggeſted that, as he did not taſte the water, which ſeems ſomewhat ſurpriſing, this ſea, or branch of it, as he conceived it to be, might have been a freſh water lake. Seals, it is obſerved, are not uncommon in the ſea of Baikal; and the whalebone might have been procured in barter. The ſuppoſed tide is not unknown on occaſion of high winds in the ſouthern lakes. However this be, Mr. Hearne ſays, that he had an extenſive view of the ſea, and that, from the mouth of the river, it was full of iſlands and ſhoals, as far as he could ſee with the aſſiſtance of a good pocket teleſcope. The ice was not then broken up, but was thawed for about ¾ of a mile from the main ſhore, and to a little diſtance round the iſlands and ſhoals. The Iſkimos here were of a dirty copper colour, and rather ſhorter in ſtature than thoſe to the ſouth. Their kettles were made of lapis ollaris, of a mixed brown and white; and their hatchets and knives were of copper. The dogs have ſharp erect ears, ſharp noſes, and buſhy tails, being a fine breed of that ſort. Many kinds of ſea-fowl were obſerved: and in the ponds and marſhes ſwans, geeſe, curlews, and plovers. The quadrupeds are muſk cattle, rein-deer, bears, wolves, wolvereens, foxes, Alpine hares, ſquirrels, ermins, mice. Mr. Hearne, in the proſecution of his ſurvey, viſited one of the copper mines, about 30 miles S.E. from the mouth of the river, which was merely a hill that ſeemed to have been rent by an earthquake, or perhaps by ſubterraneous water. The copper is found in lumps, and is beaten out by the help of fire and two ſtones.

COPPER-*Mine hills*, hills of N. America, in N. lat. 68° 30′. W. long. 112°.

COPPET, a ſmall town of the Pays de Vaud, in Switzerland, delightfully ſituated on the banks of the lake of Geneva, 12 miles N. of Geneva. It is an ancient Swiſs barony, compriſing eight villages beſides the town; its territory produces excellent red wine. The caſtle which commands the lake ſuſtained an obſtinate ſiege in 1536 againſt the troops of Berne, who at laſt reduced it to aſhes. In the year 1657, the barony of Coppet was bought by Frederick, count of Dohna. He rebuilt the caſtle in a modern ſtyle, but his ſon ſold the eſtate to an inhabitant of St. Gall, from whoſe deſcendants it was purchaſed ſome time before the French revolution by the celebrated Necker, who expended large ſums in embelliſhing a ſeat, the ſituation of which is truly enchanting, and where he cloſed his chequered career. He left it to his daughter, the baroneſs of Stahl Holſtein, whoſe name is dear to French literature, and who was baniſhed to this eſtate in 1807, for having produced the intereſting novel of Corinna. *Durand.* Statiſtique Elementaire de la Suiſſe 1795.

COPPI, JACOPO, in *Biography*, conſidered by Lanzi the ſame perſon with *Jacopo del Meglio*, was born in the Florentine ſtate in 1523, and was employed, in concurrence with the other expert manneriſts of his ſchool, in the large altar pictures of the church of Santa Croce at Florence. If, however, we may judge from the critiques of Borghini and other writers, his merit upon this occaſion appeared leſs conſpicuous than in ſome ſmall pictures of fabulous ſubjects, which formed part of the ornament of an eſcrutoire executed, under the inſpection of Vaſari, the chief of the Florentine ſchool of that period, for the prince Franceſco de Medici: but his maſterpiece is a picture repreſenting the crucifixion in the church of St. Salvatore at Bologna, which, according to Lanzi, is nowiſe inferior to the fineſt works of Vaſari himſelf, and may indeed rank with the beſt productions of the Bologneſe artiſts prior to the Caracci. It is dated 1579. The artiſt died in 1591. Lanzi, Storia Pittorica.

COPPICE, in *Rural Economy*, a low ſort of incloſed wood, which is cut over at ſtated periods, for different purpoſes.

Theſe ſorts of woods, wherever there is much demand for the various ſmall ſtuff which they are capable of affording, yield conſiderable returns to their owners; particularly where proper care is taken in fencing and preſerving them againſt live ſtock.

In caſes where new coppices are to be raiſed, it is neceſſary to beſtow great attention on the nature of the ſoil, and the expoſure of the land; adapting the trees and plants to the nature of theſe, as much as poſſible; and at the ſame time, taking into conſideration the ſorts that are the moſt uſeful, and moſt in requeſt in the particular diſtrict or vicinity: as this ſort of wood is in general diſpoſed of to the greateſt profit and advantage, where there is little trouble of carriage. The ground ſhould be well drained, where it is inclined to be wet, and alſo well incloſed from the cropping of cattle. Some likewiſe adviſe, that where it is covered with buſhes or briars, that they ſhould remain to ſhelter the young growth of wood; and that if there happen to be a moderate quantity of young oak and aſh-trees on the ſpot, to let them ſtand by all means: always keeping in mind how neceſſary ſhelter is for the growth of wood of all kinds and ſorts. But that in newly planted coppice-woods, where all the plants are of the ſame age, there is not the ſame reaſon for letting them ſtand before they are ſtooled off for underwood, as for young trees planted to fill up old woods. Thoſe which are intended for underwood may, in ſuch newly planted woods, be cut off when planted, or at any age from eight to fourteen years, without injury. Indeed, young woods ſhould not ſtand too long previous to the firſt cutting. It is obſerved in the ſeventh volume of the Letters and Papers of the Bath Society, that the kinds of wood to be planted in coppices, either in making new ones, or filling up old ones, ſhould be regulated partly by the demands of the country, but chiefly by the peculiar aptitude of the ſoil and ſituation to produce particular ſorts. Let nature be the guide, ſays the writer, in planting, and you will ſeldom do wrong. Particular ſoils and particular ſituations will always favour particular kinds of trees: we need not look for the reaſon, but only for the fact.

The chalk hills of Hampſhire are peculiarly proper for beech; the flinty loams and clays of the ſame county, for oak and aſh; the moſſy ſteep ſides of the Wiltſhire downs, for hazel; and the ſands of the ſame diſtrict, for aſh; the rugged and almoſt naked rocks of Mendip, in Somerſetſhire, produce the lime tree and the walnut in the greateſt luxuriance; and on the higheſt parts of the ſame Mendip hills, where no other tree can ſtand the ſea-breeze, ſycamore flouriſhes as well as in the moſt fertile valley. Taking the general demand of counties, and the peculiarities of different ſoils, into conſideration, it is aſſerted that there is no kind of wood ſo generally proper for planting in coppices as aſh: the value of aſh-poles being at leaſt one-third more, and frequently as much again, *per* hundred, as that of other poles, as being applicable in all ſizes to ſome uſeful purpoſe or other; the timber being always in requeſt, and ſaleable at any age or ſize, at almoſt the price of oak; and the wood itſelf being as quick a grower as any, and quicker than moſt; and, above all, there being but few ſoils, from the blackeſt and wetteſt bogs to the higheſt and moſt expoſed mountains, where it will not grow, are reaſons why aſh is one of the moſt profitable woods to plant in ſuch coppices as are favourable to its growth. In ſoils and ſituations where aſh does not grow kindly, let ſuch other ſorts of wood be planted as appear to thrive beſt in ſimilar ſoils and ſituations in the ſame county. Spaniſh cheſnut, though not ſo general a grower as aſh, is a moſt excellent wood, either for timber or underwood, and wants only to be more known to be higher in eſtimation. It partakes much of the properties of oak, but excels it in two points, namely, that it grows faſter, and that the ſap part of the timber is firmer and leſs corruptible. To fill up woods that are become thin by age or neglect, the proper time is one year, or at the utmoſt two years, after the underwood is cut. The young plants ſhould be eight or ten feet high, and an inch and an half diameter at the ground, and ſhould be planted without cutting off. If the ſoil be dry, no other preparation is neceſſary than barely digging the holes for the plants; if wet, deep drains ſhould be made, to take off the ſuperabundant water. The earth dug from theſe drains ſhould be thrown out on the lower ſide of them, and upon this new earth the plants ſhould be planted. If land of this latter deſcription be black and peaty, aſh is peculiarly proper for it; and will, if planted on the earth thrown from the drains, make a moſt ſurpriſing progreſs. If it be a ſtiff yellow clay, it is generally more favourable to the growth of oak than of aſh. In ſuch ſoils, oak for timber, with a mixture of willow, birch, alder, and Spaniſh cheſnut, for underwood, will perhaps be the moſt proper. All theſe kinds ſhould ſtand one round of the underwood; and if ſtill weak, ſhould ſtand two, before thoſe are cut off which are intended for underwood. Birch plants are indeed an exception to this rule: they ſhould always be cut off the firſt round of the underwood; for, if they are large when cut off, the ſtocks frequently decay and die. In all mixtures of kinds of wood for coppices, thoſe ſorts ſhould be uſed which are not unfriendly to each other, and which will come round fit to be cut together at the ſame periods; and ſuch kinds ſhould be allowed to ſtand for timber, and that at ſuch diſtances as to injure the underwood as little as poſſible. The plants for filling up old decayed woods of the coppice kind, ſhould be the ſtrongeſt and beſt of their kinds. Thoſe which are weak at firſt will be drawn up by the ſurrounding underwood, and become, from their increaſed height, ſtill weaker. At the next cutting of the underwood, they will be blown down; or, if cut off, the ſhoots will be too weak to grow up with the other underwood. Oak, aſh, and Spaniſh cheſnut, ſhould be kept in a nurſery for this purpoſe. Alder and birch plants grow plentifully ſpontaneouſly in ſome countries, and may be taken up for uſe; if none ſuch are to be obtained, they may be raiſed from ſeed ſoon on a moderate hot-bed, in the open air. Alder is ſometimes propagated by taking up old roots, and dividing them into ſeveral parts; and hazel may be propagated the ſame way. Willow is generally planted in cuttings; but a much better way, where there are any old willow ſtocks, is to plaſh down the ſhoots, and fill up the vacant places round ſuch old ſtocks. The wild cherry, which will grow on almoſt any ſoil, and is eaſily propagated, makes an exceedingly good underwood, though as yet it is but ſeldom uſed for that purpoſe.

It is remarked by the author of Modern Agriculture, that the coppice-woods, when the ſhoots are young, whether of oak, aſh, elm, or birch, or a mixture of theſe with other ſorts, are very little attended to in any part of the iſland; fencing being the only particular which marks the difference between a good and a bad manager. But, he ſays, when the wood can be ſold for different uſeful purpoſes, at various ſtages of its growth, as is the caſe in many parts, an eſſential improvement in the management of coppices might be introduced with great propriety. In all ſuch ſituations, it would be profitable to the owners, were the ſhoots thinned two or three times between each general cutting. The weedings or thinnings would do much more than defray the expence, while, by admitting a more free circulation of air, and by cutting off the ſupernumeraries, the principal ſhoots would advance more rapidly, and become by that means fit for ſale, perhaps, two or three years ſooner than they do by being allowed to remain in a neglected ſtate. This is a circumſtance that particularly merits the attention of thoſe who are favourably ſituated, in regard to market, for the various productions of coppices; as ſaving two or three years in the regular cuttings would materially enhance the value of the land ſo occupied.

He further ſtates, that ſeveral other improvements in the management of coppices might certainly be effected, were the owners to beſtow due attention. It frequently happens, that, from miſmanagement in cutting, many of the ſtools become uſeleſs, while ſcraggy thorns, brambles, &c, are allowed to ſpring up, and occupy the place of more valuable plants. Were the owners of coppices in general to permit their labourers, or other induſtrious poor people in the neighbourhood, to dig up the decayed ſtools and uſeleſs bruſhwood for fuel, under condition that they plant healthy vigorous ſtools in their places, the coppices by this management would neceſſarily become more valuable. Much damage alſo frequently happens from allowing the underwood to remain ſcattered over the ſurface of the wood, for a conſiderable time after it is cut. Every perſon muſt be ſenſible, that if the cuttings are allowed to remain in this ſituation till after the young ſhoots begin to ſpring, it is ſcarcely poſſible to remove them without breaking or otherwiſe injuring theſe tender ſprigs. In all auctions of coppices, it ought, therefore, to be an article of ſale, that the whole ſhould be carried off the premiſes in a limited time; and the foreſter, or wood-officer, ſhould receive injunctions to ſee this condition of the ſale ſtrictly fulfilled.

Much greater care is requiſite, the ſame writer ſays, in cutting coppices properly than the owners, in many caſes, are diſpoſed to beſtow. It cannot be ſuppoſed, when fifty or a hundred purchaſers, with their aſſiſtants, are allowed to uſe their axes with no other view than to cut the wood which they have purchaſed, without regard to the ſucceſs of what may be called the next or following crops, that any regard will be beſtowed as to the proper manner of cutting. It is certainly of much importance, not only for the future vigour, but alſo for the durability of the ſtools, that the ſtems or ſhoots ſhould be cut in that manner which experience has proved moſt effectual for anſwering both purpoſes. The ſhoots ought to be cut as low as poſſible, without injuring the ſtools. When that practice is adopted, the ſtools remain nearly even with the ground, and conſequently in a much better ſtate of preſervation than by cutting the ſtems at the height of ſix, eight, or ten inches; as, by this method of cutting being frequently repeated, the ſtools get in proceſs of time, as he has frequently ſeen, to the height of ſeveral feet above the ſurface ſoil. Another common error, and which wood-cutters of the above deſcription may be ſuppoſed very guilty of, is to leave the butt ends of the ſtems jagged and uneven, and part of the bark torn off, or looſened all the way down to the ſtool, than which nothing can be more injurious. The butt-ends of the ſtems ought rather to be brought to a point in the middle, and the bark remain quite cloſe and firm, otherwiſe dews and rain drop into the hollows, and either rot or otherwiſe prove ruinous to the future health and vigour of the ſtools. In ſhort, to render a coppice both valuable and laſting, a larger ſyſtem of management ought to be adopted. For the reaſons mentioned above, they ought to be thinned two or three times between every general cutting. The uſeleſs bruſh-wood ought to be rooted out, and other more uſeful plants ſubſtituted. Where too much water abounds, drains ought to be opened; the fences at all times kept in a ſubſtantial ſtate of repair; and on no conſideration whatever ſhould the purchaſers of coppices be allowed to cut down the woods. Men employed by the owners, and who are properly bred to the buſineſs, ought only to be employed; who, by beſtowing proper pains in dreſſing and pruning the butts and ſtools as they go along, would thereby enſure the ſpringing of numerous and vigorous ſhoots the following ſeaſon.

The periods of cutting coppice underwood muſt be regulated, it is obſerved in the work firſt mentioned, by the luxuriance of its growth, and by the demand of the country, and the uſes to which the wood is to be applied when cut: but, in general, the common rule of trade will hold good here, *viz.* "that ſmall gains and quick returns make the dealer rich, but long credit ruins." In the article of underwood, not only the intereſt of money, but the loſs of the ſucceeding growth, tells againſt the value of ſtanding wood after it is fit to cut, and makes it doubly the advantage of the owner to cut his underwood as early as it is ſaleable. As ſoon, therefore, as any kind of wood is fit for the uſes of the country, it ſhould then be cut; unleſs it can be made appear, that it will pay compound intereſt for ſtanding longer, or, in other words, will pay not only the ſimple intereſt of the firſt value, but alſo the loſs of ſo many years growth of the wood, as ſo far advanced towards another crop. Wood merely for fuel can ſcarcely be cut too young. Hazel is uſually fit for hurdles and dead hedges, from nine to twelve years old; aſh for ſheep-cribs, at the ſame age; and aſh and other woods for hop-poles, from eleven to fourteen years old: while aſh for carpenters, and other large uſes; alder, birch, and willow, for rafters, turner's uſes, pattens, clogs, coal-pit uſes, &c. muſt ſtand from ſixteen to twenty years, before the poles are large enough for their reſpective purpoſes. It therefore behoves every owner of woods of the latter deſcription, unleſs he is public-ſpirited enough to give up his own profit to the good of the public, to conſider well before he ſuffers his wood to ſtand to the age of ſixteen, eighteen, or twenty years, whether the value of ſuch wood, when cut younger, and ſold for other purpoſes, added to the intereſt thereof up to the uſual period of cutting, and the gain by the growth between theſe two periods, will not more than equal the value the wood will be of, if ſuffered to ſtand ſo long; and if ſo, whether he ought not to cut his wood at ſhorter periods. He will have this additional ſatisfaction, that, by more frequent cuttings, his wood will be the leſs liable to decay, by the ſtrong ſhoots ſmothering the weak ones, as is before explained; and will have an opportunity of letting up more ſaplings for timber than he could otherwiſe do. There are many opinions reſpecting the moſt proper time of the year for cutting underwood; but there is one rule which, on the ſeller's part, is without exception, *viz.* that the older the wood is, the later in the ſpring it ſhould be cut. When old wood is cut early in the winter, and a hard winter follows, the damage done to the ſtocks is very great: young flouriſhing wood will bear cutting at any time. But on the part of the buyer, it is allowed that all woods are more durable, when cut in the moſt ſtagnant ſtate of the ſap; and in all caſes where bending is required, ſuch as hurdles, hoops, and even dead hedges, the wood cannot be cut too early in the winter, being,

ing, if cut when the ſap is riſing, brittle, and unfit for thoſe purpoſes. Oak underwood will, at the preſent price of bark, pay well for ſtanding till the ſap is up for barking it; and it ſeldom happens that the ſtocks are injured by cutting it ſo late in the year.

The beſt way of diſpoſing of coppice-underwood, to anſwer the purpoſe of the ſeller, is, in the opinion of this writer, to cut it at the ſeller's expence, before it is ſold; to lay it out in ranges or drifts, according to the cuſtom of the country; to value it in that ſtate, and ſell it in ſuch ſized lots as the number of buyers may warrant: always keeping up a ſufficient number to make a competition, and particularly to oblige the buyers to clear the whole out of the wood by the 24th day of June; and never to ſuffer them to bring their horſes into the woods, after any new ſhoots are ſhot out, without muzzling them, or at leaſt tying up their heads.

But in the View of Modern Huſbandry, Mr. Donaldſon thinks, that the more approved method of diſpoſing of coppice, or other under-ſized wood, is that which is practiſed in Northamptonſhire. When the ſeaſon for cutting arrives, which is during the winter months, or before the ſap begins to aſcend, that operation is performed by people employed by, and who work under the direction of, the owner of the woods or his agent. The part of the wood intended to be ſold, is parcelled out into regular ſized lots, to ſuit the convenience of the intended purchaſers. The whole of the underwood, growing upon each lot, is indiſcriminately cut, and laid in one direction. As ſoon as the operation of cutting is completed, and the wood parcelled out in a proper manner, a valuation is put on each lot or parcel according to its quality, and the whole is then ſold by public auction to ſuch perſons as incline to become purchaſers, who, over and above the price of the underwood, repay the expence of cutting. This is, however, by no means the general mode in which woods of this deſcription are cut. It is a very common, but a very bad, practice, to ſell the coppice under the condition that the purchaſers are to be at the expence of cutting it down. This is often performed in ſuch a careleſs manner, that the ſtools are ſo greatly injured, that they either rot or die, or a few weak ſtinted ſhoots only ſpring up.

The price of coppice or underwood varies ſo exceedingly, that it is almoſt impoſſible to form any idea of the value of the acre. Perhaps 8 or 9*l.* may not be far from the average price of coppices, not remarkably ſituated in regard to market, and when they are cut every twelve or fourteen years. But the value of coppices depends on many circumſtances; as the roots of wood, the uſes to which they are applied; the price of bark, &c. In ſome parts of Kent, where hop-poles are in great requeſt, an acre of coppice will yield ſometimes 30 or 40*l.* at a cutting. Whereas in Scotland, where the coppices are for the moſt part oak, and where the wood is chiefly uſed for fuel, or converted into charcoal, the value of the coppices conſiſts almoſt entirely in the quantity and quality of the bark, the wood being little more than ſufficient to defray the expence of cutting and peeling.

Mr. Marſhall, in his "Management of Landed Eſtates," has remarked, in reſpect to ſtub or coppice wood, that "the proper harveſting it as of timber, depends on ſituation and other circumſtances. And that the age or ſize of cutting muſt ever be guided by the demand in a given diſtrict; whether it be for the uſe of coal-mines, or for cord-wood, hop-poles, hoops, ſticks, faggot-wood, or other ware.

"The mode of diſpoſal is," ſays he, "to be determined upon by the ſucceeding crop. If the land be intended to be appropriated wholly to coppice wood, it is generally the moſt eligible to diſpoſe of the crop, as it ſtands, by auction or propoſal. But if ſeedling plants are to be ſet out for timber ſtands, or the young ſhoots from the ſtubs to be trained up, in the grove manner, it is requiſite that a proprietor ſhould employ his own people in reaping the crop, and making it up into ſuch wares as are the moſt ſaleable and profitable.

"In cutting down coppice-woods, the main obſervances are," he thinks, "to cut them in ſeaſon, to take off the ſtems, clean and ſmooth, with upward ſtrokes of the axe, that the ſtubs may ſhoot with the greater certainty; and to cut them off as low as conveniency will allow, in order that the ſhoots may be few and vigorous."

Coppice-*Wood*, is that ſort of ſmall woody growth, which is raiſed in incloſed woods of the coppice kind, and which is converted to various purpoſes of the farmer and manufacturer, ſuch as cord-wood, hop-poles, hoop-ſtuff, hedge-ſtuff, faggot-wood, and various other ware.

COPPLE-Stones, in *Natural Hiſtory*, globuli lapidei, rotulæ lapideæ, boulder-ſtones, rolled-ſtones, or pebbles, as ſome call them, are rounded and worn fragments of ſtones and rocks, that are not inveſted with an exterior ſtony cruſt or ſkin, occaſioned by concentric laminæ of the ſtone, but ſhew the internal plane laminæ broken off and rounded at their edges by attrition. It is of the utmoſt conſequence, in all reſearches relating to the ſtrata of the earth, to diſtinguiſh carefully between copple or boulder-ſtones, and original nodules of the ſtrata.

COPPY, in *Rural Economy*, is a term ſometimes provincially employed to ſignify a wood of the coppice kind. Thus to coppy, in ſome diſtricts, ſignifies to cut over for underwood.

COPRATAS, in *Ancient Geography*, a river of Aſia, in the Perſian territory, mentioned by Strabo and Diodorus Siculus; the latter of whom ſays, that it diſcharged itſelf into the Tigris.

COPRIA, a name given by Strabo to a ſhore of Sicily before Tauromenium, becauſe the wrecks of veſſels that were loſt in the gulf of Charybdis were collected in this place.

COPROCRITICA, from κοπρος, *excrement*, and κρινω, *ſeparate;* medicines which purge away the excrements in the guts.

COPROPHAGOS, from κοπρος, and φαγω, *I eat;* the *dung-fly*, in *Natural Hiſtory*, the name given by many authors to the common yellowiſh fly found on human excrements. There are ſeveral other ſpecies found on the excrements of various animals, and thence called *merdivoræ*.

COPROSMA, in *Botany*, (from κοπρος, *dung*, and οσμη, *ſmell*, alluding to the offenſive ſmell of the firſt ſpecies.) Forſt. Gen. 69. Linn. jun. Supp. 24. Schreb. 1593. Juſſ. 205. Lam. Ill. pl. 854. Claſs and order, *polygamia monœcia* (*pentandria digynia;* Linn. jun.) Nat. Ord. *Rubiaceæ*, Juſſ.

Gen. Ch. *Hermaphrodite flowers*. *Cal.* Perianth inferior, one-leafed, ſhort, five-toothed, permanent. *Cor.* monopetalous, bell-ſhaped, much larger than the calyx, five, ſix, or ſeven-cleft; ſegments acute, erect. *Stam.* Filaments five, ſix, or ſeven, capillary; anthers oblong, bifid at the baſe, erect, a little incurved, acuminate. *Piſt.* Germ ſuperior, oblong; ſtyles two, filiform, ſlightly cohering at the baſe, longer than the corolla, divaricated; ſtigma ſimple. *Peric.* Berry ovate-globular. *Seeds* two, flat on the inner.

ıner, and convex on the outer ſide, ſeparated from each other by the pulp of the berry. *Male flowers*, *Cal.*, *Cor.*, and *Stam.*, as in the hermaphrodite. *Piſt.* abortive.

Eſſ. Ch. Calyx one-leafed, five-toothed. Corolla five, ſix, or ſeven-cleft. Stamens five, ſix, or ſeven. Styles two, long. Berry with two ſeeds.

Sp. 1. C. *fœtidiſſima.* Forſt. Fl. Auſt. 138. Linn. jun. Supp. 178. Mart. 1. Lam. 2. "Flowers ſolitary." A very fœtid ſhrub. 2. C. *lucida.* Forſt. Fl. Auſt. 137. Linn. jun. Supp. 178. Mart. 2. Lam. 1. "Peduncles compound." A perfecty ſmooth ſhrub, reſembling phyllis in its habit. *Leaves* oppoſite, petioled, egg-ſhaped, acuminate upwards and downwards, quite entire. *Stipule* interfoliaceous, ſolitary, combining the leaves, acute. *Peduncles* axillary, ſolitary, oppoſite, two-leaved, terminated by heads of pedicelled flowers. Calyx and corolla greeniſh. Both the ſpecies are natives of New Zealand.

COPSE, in *Agriculture*, a term applied to the regulating iron apparatus, which is fixed to the end of the beam of a plough, and to which the team is attached. Theſe irons are of very different forms and conſtructions according to circumſtances.

COPTIS, in *Botany*, (from κοπτω, *ſcindo;* a name taken from the cut leaves of the plant.) Linn. Tranſ. vol. viii. p. 305. A genus formed by Mr. Saliſbury for Helleborus trifolius of Linnæus, which differs from the other hellebores, in having a caducous corolla. See Helleborus *trifolius*.

COPTIS, in *Ancient Geography*. See Coptos.

COPTITES *Nomos*, a nome of Egypt, extending along the bank of the Nile, which derived its name from Coptos or Coptis, its capital.

COPTOPSKILL, in *Geography*, a town of America, in the ſtate of New York; 42 miles N. of New York.

COPTOS, *Coptus*, or *Coptis*, in *Ancient Geography*, now *Kepht*, a city of Upper Egypt, three miles diſtant from the Nile, and connected with it by a navigable canal. It was the centre of communication between Egypt and the Red Sea, by a N.E. route to Myos Hormus, ſituated on the weſtern coaſt of the Red Sea, and by a S.E. courſe to Berenice, which was the ſtaple of the trade with India. If Plutarch is to be credited, Iſis, upon receiving the news of the death of Oſiris, cut off one of her locks in token of grief; and hence the place was named Coptos, which, in the Egyptian language, is ſaid to denote want or privation. This city was inhabited both by the Egyptians and Arabians, and Pliny calls it the emporium of commodities brought from India and Arabia, which were conveyed by the Nile to Alexandria. Pliny mentions Juliopolis, as being two miles diſtant from Alexandria, and ſays that from Juliopolis to Coptos, the voyage of 303 miles was performed in 12 days, when the northerly winds blew; the diſtance between Berenice and Coptos was, according to the ſame author, 258 Roman miles, and the journey was performed in 12 days. The road, however, lay through the deſart of Thebais, almoſt entirely deſtitute of water; but Ptolemy Philadelphus not only repaired the road, but made proviſion for ſupplying the want of water by ſearching for ſprings; and wherever theſe were found he built inns, or more probably in the eaſtern ſtyle caravanſeras, for the accommodation of merchants. (Strabo, lib. xvii. p. 1157.) In this channel the intercourſe between the eaſt and weſt continued to be carried on during 250 years, as long as Egypt remained an independent kingdom. The Chriſtians were formerly very numerous in the city of Coptos. The rubbiſh of this ancient city may fill a circumference of two miles, and ſufficiently evinces its former extent. Amidſt the ruins are ſeen ſeveral ſmall columns of grey granite lying on the ground, and ſome large ſtones, engraved with hieroglyphics. Near it is alſo a ſmall part of a bridge over the canal by which water was conveyed from the river into a large baſon. This place has occaſionally afforded medals, ſmall ſtatues of earthen-ware, pieces of rock cryſtal, and precious ſtones.

COPULA, in *Logic*, a verb that connects any two terms in a propoſition, either negative or affirmative: as, *A roſe is ſweet;* where *is* is the copula.

COPULATION. See Coition, Congress, and Consummation.

COPULATIVE *Propoſitions*, are thoſe which include ſeveral ſubjects, or ſeveral attributes joined together by an affirmative or negative conjunction.

Thus, v. gr. *Power and riches do not make a man happy.*

Where *and* is the conjunction that couples *power* and *riches*.

Copulative *Conjunction*. See Conjunction.

COPY, in *Law*, a tranſcript of a writing or inſtrument, made for the uſe and ſatisfaction of ſome of the parties concerned; or in order to preſerve the memory thereof. See Copia.

The copy of an inrolled deed is admitted in evidence; but not the copy of a will of lands nor the probates, nor of a common deed where the original may be procured. Few ancient documents do now ſubſiſt otherwiſe than in copies.

Copy is alſo uſed for an imitation of any original work; particularly a painting, draught, figure, &c.

The following proceſs for taking a copy of a recent MS., was communicated to the Philomathic Society at Paris, by M. Charles Coquebert. 'It conſiſts in putting a little ſugar in common writing ink, and with this the writing is made on common paper, ſized as uſual, when a copy is required; this unſized paper is taken and lightly moiſtened with a ſponge. The wet paper is then applied to the writing, and a flat iron, ſuch as is uſed by laundreſſes, of a moderate heat, being lightly paſſed over the unſized paper, the counterproof or copy is immediately produced. This proceſs is the more intereſting, as it requires neither machine nor preparation, and may be uſed in any ſituation. That ſugar prevents ink from ſpeedily drying, has been long known (ſee Ink); and this method of impreſſion has been uſed in ſome of our public offices, and elſewhere in England, for ſome years.

Copy, among *Printers*, denotes the manuſcript or original of a book given to print from.

To caſt off a copy, is to make a computation of the number of ſheets a manuſcript will make in print.

In the bookſellers' ſtyle, a *good copy* is that which produces a ſaleable book.

Tenant by Copy *of court roll.* See Tenant.

COPY-HOLD, is a tenure for which the tenant has nothing to ſhew but the *copy* of the roll made by the ſteward of the lord's court.

The ſteward of the court is, among other things, to inroll and keep a regiſter of all ſuch tenants as are admitted to any parcel of land, or tenement, belonging to the manor; and the tranſcript is called the *copy of the court-roll*, which the tenant keeps as his own evidence.

This tenure is called a *baſe tenure*, becauſe the tenant holds, in ſome ſort, at the will of the lord. Fitzherbert ſays, it was formerly called *tenure in villenage;* and that *copy-hold* is but a modern name.

This is the land which the Saxons called *folk-land*, as being held *ſine ſcripto*, in contradiſtinction to *bock-land*, or *charter-land*, *terra ex ſcripto*, and now *free land*, or *free hold*.

However, it is not ſimply at the lord's will, but according to the cuſtom of the manor; ſo that if the copy-holder doth not break that cuſtom, and forfeit his tenure, he ſeems not to ſtand at the lord's courteſy. Theſe cuſtoms are infinite; varying in one point or other, almoſt in every manor.

Copy-holders are, in reality, no other but villeins (ſee VILLEIN), who, by a long ſeries of immemorial encroachments on the lord, have at laſt eſtabliſhed a cuſtomary right to thoſe eſtates, which before were held abſolutely at the lord's will.

This affords a very ſubſtantial reaſon for the great variety of cuſtoms that prevail in different manors, with regard both to the deſcent of the eſtates, and the privileges belonging to the tenants. By various means the generality of villeins in the kingdom have long ago ſprouted up into copy-holders; their perſons being infranchiſed by manumiſſion, or long acquieſcence; and their eſtates, in ſtrictneſs, remaining ſubject to the ſame ſervile conditions and forfeitures as before; though, in general, the villein-ſervices are uſually commuted for a ſmall pecuniary quit-rent. In ſome manors the copy-holders were bound to perform the moſt ſervile offices; as to hedge and ditch the lord's grounds, to lop his trees, and reap his corn, and the like; the lord uſually finding them meat and drink, and ſometimes, (as is ſtill the caſe in the highlands of Scotland) a minſtrel or piper for their diverſion. Thus alſo, in the kingdom of Whidah, on the coaſt of Africa, the people are bound to cut and carry in the king's corn from off his demeſne lands, and are attended by muſic during the whole time of their labour. See WHIDAH.

The cuſtom of the manor is the life of copy-hold eſtates; for, without a cuſtom, or if copy-holders break their cuſtom, they are ſubject to the will of the lord; and as a copy-hold is created by cuſtom, it is alſo guided by cuſtom. (4 Rep. 21.) A copy-holder, whilſt he performs his ſervices, and doth not break the cuſtom of the manor, cannot be ejected by the lord; if he be, he ſhall have treſpaſs againſt him:—but if a copy-holder refuſe to perform his ſervices, it is a breach of the cuſtom, and forfeiture of his eſtate. Some copyholders hold by the *verge* in *ancient demeſne*; ſo that though they hold by copy, they are a kind of free-holders; ſome others hold by common tenure, called "mere copy-hold," whoſe land, upon the commiſſion of felony, eſcheats to the lord of the manor.

It ſhould be recollected, however, that copy-hold land cannot be made at this day; for the foundation of a copy-hold is, that it hath been demiſed time out of mind, by copy of court-roll; and that the tenements are parcel of, or within the manor. 1 Inſt. 58. 4 Rep. 24.

Eſtates held by copy of court-roll, and not at the will of the lord, have been deemed free-hold by lord Coke (1 Inſt. 59 *b*.) and alſo by others; and by way of diſtinction from the ordinary kind, they have been denominated "cuſtomary free-holds." Tenants of this deſcription have claimed the right of voting at the election of the knights of the ſhire. But the ſtat. 31 Geo. II. c. 14, enacts, that no perſon holding by copy of court-roll, ſhould have this privilege.

In ſome manors, where it has been the cuſtom to permit the heir to ſucceed the anceſtor in his tenure, the eſtates are ſtyled "copy-holds of inheritance;" in others, where the lords have been more vigilant to maintain their rights, they remain "copy-holds for life," only; for the cuſtom of the manor has, in both caſes, ſo far ſuperſeded the will of the lord, that provided the ſervices be performed or ſtipulated for by fealty, he cannot, in the firſt inſtance, refuſe to admit the heir of his tenant upon his death; nor, in the ſecond, can he remove his preſent tenant, ſo long as he lives, though he holds nominally by the precarious tenure of his lord's will. If the lord refuſes to admit, he ſhall be compelled in chancery. (2 Cro. 368.) And if the lord refuſe to admit a ſurrendree, on account of a diſagreement about the fine to be paid, the court of B. R. will grant a mandamus to compel the lord to admit without examining the right to the fine. (2 Term Rep. 484.) But that court will not grant a mandamus to admit a copy-holder by deſcent; becauſe, without admittance, he has a complete title againſt all but the lord. (2 Term Rep. 198.) Copy-holds deſcend, according to the rules and maxims of the common law (unleſs in particular manors there are contrary cuſtoms of great antiquity); but ſuch cuſtomary inheritances ſhall not be aſſets, to charge the heir in action of debt, &c. (4 Rep. 22.) though a leaſe for one year, of copy-hold lands, which is warranted by the common law, ſhall be aſſets in the hands of an executor. (1 Vent. 163.) Copy-holders hold their eſtates free of dower, being created by cuſtom, which is paramount to title of dower. (4 Rep. 24.) By particular cuſtom, there may be dower and tenancy by the curteſy. (Cro. Eliz. 361.) There may be an eſtate-tail in copy-hold lands by cuſtom, with the co-operation of the ſtat. W. II. And as a copy-hold may be entailed by cuſtom, ſo by cuſtom the tail may be cut off by ſurrender. (1 Inſt. 61.) A copy-hold may be barred by a recovery, by ſpecial cuſtom; and a ſurrender may bar the iſſue by cuſtom. A fine and recovery at common law will not deſtroy a copy-hold eſtate; becauſe common law aſſurances do not work upon the aſſurance of the copy-hold; though copy-hold lands are within the ſtat. 4 Hen. VII. c. 24, of fines and proclamations, and five years non-claim, and ſhall be barred. (1 Rol. Abr. 506.) Copy-holds are not within the ſtatute 27 Hen. VIII. c. 10, of jointures; nor ſtat. 32 Hen. VIII. c. 28, of leaſes; copy-holds being in their nature demiſable only by copy; they are not within the ſtatute of uſes; nor are copy-holds extendible in execution; but they are within the ſtatute of limitation of actions, and the ſtatutes againſt bankrupts. The lord ſhall have the cuſtody of lands of ideots, &c. And a copy-holder is not within the act 12 Car. II. c. 24, to diſpoſe of the cuſtody and guardianſhip of the heir; for, if there be a cuſtom for it, it belongs to the lord of the manor. (3 Lev. 395. 1 Nelſ. Abr. 492, 522.) A copy-holder cannot convey or transfer his copy-hold to another, otherwiſe than by *ſurrender*; which ſee.

A manor may be held by copy of court-roll, and the lord of ſuch manor may grant copies; and ſuch cuſtomary manor may paſs by ſurrender and admittance, &c.

The fruits and appendages of a copy-hold tenure, which it hath in common with free tenures, are fealty, ſervices, (as well in rents as otherwiſe,) reliefs, and eſcheats. The two latter belong only to copy-holds of inheritance, the former to thoſe for life only. Beſides theſe, copyholds have alſo heriots, wardſhips, and fine. See each of theſe articles. See alſo FORFEITURE, FREEHOLD, SURRENDER, and TENURE.

COPY-HOLDER, is defined by Weſt, a perſon admitted tenant of any lands, or tenements, within a manor, which, time out of mind, by the uſe and cuſtom thereof, have been deviſable to ſuch as will take the ſame by copy of court-roll, according to the cuſtom of the ſaid manor.

COPYING *of* Letters, *and other writings.* The celebrated Dr. Franklin made ſeveral eſſays, many years ago, for ſpeedily multiplying the copies of his own hand-writing, which he exhibited to M. Alexis Rochon, of the French National Inſtitute, and director of the Marine Obſervatory at the port of Breſt; an account of which he has given in his memoir on the Typographic Art. This method conſiſted in writing upon ſmooth paper, with ink containing much gum, which was afterwards ſanded with emery, or powder of caſt-iron, and by means of a rolling-preſs, ſuch as is uſed by the copper-plate printers, the ſtrokes of the writing were transferred to a plate of roſe copper or pewter. This plate ſupplies as many copies as the depth of the engraving can allow; but the copies are far from being beautiful, and the ground is ſpotted and ſpoiled. Before Dr. Franklin's proceſs was communicated to M. Rochon, he ſhewed him that by writing with a ſteel point on a copper-plate previouſly varniſhed, a more ſatisfactory reſult might be obtained, by etching the ſtrokes with nitric acid to a ſufficient depth, for the ſubſequent uſe of a liquid ink ſimilar to that of the printers. In this caſe, the plate may be wiped without precaution, and twelve or more copies may be pulled off upon coarſe paper. Theſe proofs are foul and reverſed; and, therefore, in order to have them neat and in the proper direction of the writing, it becomes neceſſary to place the ſame number of leaves of white paper, wetted and prepared, upon the twelve proofs; and while the ink is ſtill freſh, the whole being paſſed together through the rolling-preſs, the ſame number of leaves of counter-proofs are obtained as there were proofs; ſo that inſtead of twelve turns of the preſs, thirteen will be required to ſupply twelve counter-proofs, very black, neat, and legible, even when the plate has not been perfectly wiped. This method is certainly not to be compared with fine engraving; but it may be uſeful in military operations, and all other caſes in which a ſpeedy multiplication of copies is required. No precaution is here neceſſary; whether the nitrous acid be more or leſs ſtrong, or remain a longer or ſhorter time upon the plate, or whether the plate be ſomewhat heated to increaſe the ſtrength of the ſolvent, the proceſs of the operation will never fail; provided the ſteel point made uſe of to trace the characters through the varniſh, ſhall lay the copper perfectly bare. It is of advantage that the nitric acid ſhould bite deep, becauſe the counter-proofs are, by theſe means, much darker. The plate need not be well wiped, becauſe it is of no conſequence whether the proof which is uſed to afford a counter-proof ſhould be very clean, provided that it does not ſpot the copy intended to be procured. The moſt liquid kind of printers ink may be uſed. See Engraving and Stereotype.

In 1780, Mr. James Watt, of Birmingham, obtained a patent for a new method which he had invented to this purpoſe; of which the following deſcription is given in his ſpecification: Let the letter or other writing, that is intended to be copied, be written with the ink hereinafter deſcribed, or with any other writing-ink fit for the purpoſe. Take a piece, or pieces, of thin paper which contains no ſize, or glue, or gummy or mucilaginous matter, or which at leaſt does not contain ſo much ſize, or other matter, as would make it fit for being written upon. Cut this paper, or papers, to the ſize and ſhape of the writing of which a copy is wanting; moiſten or wet the ſame thin paper with water, or other liquid, by means of a ſpunge or bruſh, or by dipping, or otherwiſe. Having moiſtened or wet the thin paper, lay it between two thick unſized ſpungy papers, or between two cloths, or other ſubſtances capable of abſorbing the ſuperfluous moiſture from the thin paper; when it has been ſlightly preſſed between ſuch thick ſpungy papers, or other ſubſtances, by the hand or otherwiſe, lay the ſaid thin paper, ſo moiſtened and preſſed, upon or under the ſide of the writing which is to be copied, and in ſuch manner that the one ſide of the ſaid moiſtened paper ſhall be in contact all over the ſide of the ſaid writing, ſo intended to be copied; and that to the other ſide of the ſaid moiſtened thin paper, there ſhall be applied a piece of clean writing-paper, or cloth, or other ſmooth uniform ſubſtance. Lay the ſaid writing intended to be copied, with the thin moiſtened paper intended to receive the copy, (placed reſpectively as above directed,) upon the board of a common rolling-preſs, or of that of which a deſcription and drawing are hereunder written and drawn, and preſs them once, or oftener, through the rolls of the ſaid preſs, in the ſame manner as is uſed in printing by copper-plates; or, inſtead of uſing the ſaid or any rolling-preſs, ſqueeze the ſaid papers, placed reſpectively in the manner above deſcribed, in a ſcrew-preſs; or ſubject them to any other preſſure ſufficient for the purpoſe; by means of which preſſure, in whatever manner applied, part of the ink of the writing intended to be copied ſhall preſs from the ſaid writing into, upon, and through, the ſaid thin moiſtened paper, ſo that a copy of the writing, more or leſs faint, according to the quality of the ink and paper employed, ſhall appear impreſſed on both ſides of the ſaid moiſtened paper, *viz.* upon one of the ſides in the natural or proper order and direction of the lines, as they are in the original writing, and on the other ſide in the reverſe order and direction. But, in order to make the impreſſion or copy of the writing more ſtrong, legible, and durable, it is proper and uſeful to moiſten the ſaid thin paper, which is to receive the copy or impreſſion, with the following liquor, inſtead of water or other liquid, and to proceed in all other reſpects as is above directed; or to moiſten the ſaid thin paper with the following liquor, and to dry the ſaid paper, and, when a copy of a writing is required to be taken, the ſaid paper, thus previouſly prepared and dried, ought to be moiſtened with water or other liquid, and to be proceeded with in all other reſpects as has been directed. The ſaid liquor to be uſed for moiſtening the ſaid thin paper, or for preparing the ſaid paper previouſly to its being uſed, is made in the following manner: Take of diſtilled vinegar two pounds weight, diſſolve in it one ounce of the ſedative ſalt of borax; then take four ounces of oyſter-ſhells, calcined to whiteneſs and carefully freed from their brown cruſt, put them into the vinegar, ſhake the mixture frequently for four-and-twenty hours, then let it ſtand until it depoſits its ſediment; filter the clear part through unſized paper into a glaſs veſſel, then add to the ſaid mixture or ſolution two ounces of the beſt blue Aleppo galls bruiſed, and place the liquor in a warm place, ſhaking it frequently for twenty-four hours; then filter the liquor again through unſized paper, and add to it, after filtration, one quart, ale meaſure, of diſtilled or other pure water. It muſt then ſtand twenty-four hours, and be filtered again if it ſhews a diſpoſition to depoſit any ſediment, which it generally does. The liquor, thus compounded and prepared, is to be uſed as hath been directed.

N. B. In place of the vinegar, any other liquor impregnated with a vegetable acid may be uſed; and, in place of the galls, oak bark, or any other vegetable aſtringent, or ſubſtance which is capable of becoming black, or deep coloured, with ſolutions of iron; and, in place of the oyſter-ſhells, any other pure calcareous earth may be uſed. But if the impreſſions are not wanted to be very black, and the writing ink is good, water itſelf may be uſed to moiſten the thin paper, as herein firſt directed. It may be found neceſſary to add more or leſs water, in the preparation of the above liquor to be uſed for moiſtening the thin paper, or to vary the proportions of the other ingredients, according as they are more or leſs perfect or ſtrong, or as the impreſſion is required to be more or leſs deep coloured. The writing-ink, which the patentee uſes for letters or writings intended to be copied, is prepared as follows: Take four quarts, ale meaſure, of ſpring water; one pound and a half, avoirdupoiſe weight, of Aleppo galls; half a pound of green copperas or green vitriol; half a pound of gum-arabic; four ounces of roach-alum; pound the ſolid ingredients, and infuſe them in the water ſix weeks or two months, during which time the liquor ſhould be frequently ſhaken; ſtrain the liquor through a linen cloth, and keep it in bottles, cloſely corked, for uſe.

Plate III. *Miſcellany, fig.* 1. repreſents a front or end view of the rolling-preſs invented by Mr. Watt, and referred to in the above ſpecification. A B C is one of the ends of an iron or wooden frame, which ſerves to connect the two rollers. D, D, are two wooden or metalline rollers, turned extremely exact, or truly cylindrical, and which are mounted on iron axles, firmly fixed in them. E E is a double-ended lever, by means of which the roller, on whoſe axle it is applied, may be forcibly turned round. F F repreſents the board of the rolling-preſs, on which the writings to be copied are to be laid. N N is a piece of cloth, or other elaſtic pliable ſubſtance, placed next the roller, and above the writings to be copied; and the board, G, is a ſtrong plank of wood, or plate of metal, ſerving to connect the two end-pieces of the frame at bottom. H H repreſents the edge of a common table, to which the preſs may be faſtened by the iron ſcrew-cramps I, I. K is a ſlit, of which there is one in each end-piece of the frame; theſe ſlits are filled with elaſtic ſteel, or other metalline ſprings, or with ſome other elaſtic ſubſtances which ſerve to preſs the two rollers forcibly together. L is a braſs bolſter, ſupported upon the ſprings, and ſerving to ſupport the end of the axis of the under roller.

Fig. 2. repreſents a ſide-view of the rolling-preſs, in which A B, A B, are the two end-pieces of the frame. D, D, are the two rollers. E is the double-ended lever. G is a ſtrong plank, or plate of metal, which forms the bottom of the frame. H H is the table on which the preſs ſtands. I is one of the iron cramps which faſten the preſs to the table; and M is a bar of iron which connects the upper part of the frame.

Fig. 3. repreſents a ſcrew-preſs, which may be uſed, inſtead of the rolling-preſs, in taking off impreſſions from writings. A A is a double-ended lever. B B the ſcrew. C a block of wood, or metal, which the ſcrew acts upon, and which is attached to it. D D the frame of the preſs, made of iron or wood. E E is a moveable board, on which the writing to be copied is to be laid, with a cloth over it. F F the bottom or ſole of the preſs, made of wood or metal. Be it remembered, that theſe preſſes are made of different ſizes, according to the ſizes or largeneſſes of the writings intended to be copied. Thoſe now referred to are drawn from one ſufficiently large to take an impreſſion from a folio page of writing or poſt paper, and are drawn to a ſcale of one inch and a half for each foot, or one-eighth of their natural ſize.

Fig. 4. repreſents one of Hawkins's patent polygraphs, for making two or more copies of any writing at once. A A B, is an upright frame, from the upper piece of which is ſuſpended a double parallel ruler, D D, E E; *d d*, *e e*, is another ſimilar parallel ruler, of which *fig.* 5. is a plan, faſtened to the board, F F, of the inſtrument. Theſe two rulers are connected to a ſtout bar, G; the vertical one, D D E E, by pivots at the end of the bar, H, *fig.* 4. going into holes in the projecting part of two pieces of braſs, *g g*, at each end of G; and the horizontal one, *d d e e*, by pivots at the ends of its correſponding bar, *h*, working in holes in another arm of the ſame braſſes. The pens are connected with the bar, G, by a curved braſs limb, *a*, turning on a ſcrew put through the bar, G, as a centre. On the other ſide of the bar is a ſhort arm, *b*, in the ſame piece with the limb: this is jointed at its upper end to the end of a ſmall rod, *i*, the other end of which is jointed to another exactly ſimilar limb, carrying the other pen. The pens are fitted into a ſmall tube, called the pen-tube, having a ſhoulder at its upper end. This fits tight into another tube, in the ſame piece with the curved limb, and is puſhed in as far as the ſhoulder of the pen-tube will allow.

The weight of the machinery is ſuſpended by eight ſmall ſpiral ſprings, I, faſtened to a ring fixed to the bar, G; their upper ends are connected with the end of a double jointed lever, K, which can follow the motion of the bar, G, without ſtretching the ſprings too much. The rod, L, by which the perpendicular motion is ſuſpended, turns upon pivots working in pieces of braſs beneath the piece, B: the right-hand one is called a regulator, and has two ſcrews, one moving the pivot vertically, and the other horizontally, for adjuſting the inſtrument. The two bars, *e e*, of the horizontal motion are connected with *d d* by pivots at the end of *h*, ſo that *d d* can be lifted up without moving the other, whoſe weight is ſupported upon two ſmall braſs wheels *i, i*. The frame, A A B, when the inſtrument is not in uſe, turns down on the board, F F, and is kept faſt by a ſpring lock, which is opened by puſhing in a round button, *k*. The frame now forms the ſides, and the front board becomes the lid, and, when ſhut down, is locked by a lock, M. In explaining the uſe of the inſtrument, we cannot do better than copy the printed directions ſold with the inſtrument. Chooſe two gooſe quills, taking care they are of the ſize wanted; make them into pens, and put them into the pen-tubes. Having introduced them with the nibs firſt, apply the ſhoulder end of the pen-tube againſt the ſemi-circular hollow, in the upright part of the gauge, Q, *fig.* 4. and puſh the pen through the tube, till the nib reaches a line drawn acroſs the end of the gauge; ſlide the pen-tube into the fixed ſocket, until the ſhoulder of the pen-tube ſtop it, holding by the fixed ſocket, and not by the work, ſo as not to ſtrain the machinery. If the polygraph is in order, the pens will now write, draw, or copy whatever may be required, with the greateſt exactneſs. To prove the machine's being in order, bring the pens to the upper part of the paper, and try if they both touch; if not, with a ſmall ſcrew-driver turn the perpendicular ſcrew of the regulator, till they touch equally. Bring the pens to the bottom of the paper, and move the horizontal ſcrew till they both touch. When a pen wants mending, nothing more is neceſſary than to take the pen-tube out of the ſocket, mend the pen, gauge it, and return it into the ſocket again. When the machine is out of uſe, wipe the pens clean, and place the left one, with the curved limb, on the hook beneath the horizontal rulers. Let down the frame, A A B, which faſtens by a ſpring-lock, and at the ſame time raiſes the writing-board, which then becomes the lid of the portable caſe for the polygraph.

The patent now belongs to Mr. Farthing, Cornhill, who manufactures the inſtruments.

Theſe inſtruments are made with three, four, and five pens, and anſwer the purpoſe very well.

COPYIST, in DIPLOMATIC *Science*, ſignifies a tranſcriber or copier of deeds, books, &c.

COPYIST, a tranſcriber of *Muſic*. Whatever improvements have been made in literary typography, no muſic printed with types has equalled that of writing, engraving, or ſtamping. Rouſſeau has extended this article to a greater length than ſeems neceſſary. It is indeed neceſſary for a *copyiſt* to know practical muſic well, and to be ſufficiently acquainted with compoſition to avoid groſs miſtakes himſelf and detect them in others; to write a neat and legible hand; to know the Italian and French technieu, to form all the characters in a bold and clean manner; and, by underſtanding the language of muſic, leaving no bar incomplete, by omiſſion or redundance. Theſe ſeem to be all the neceſſary requiſites of a good *copyiſt*, if to them be added care and accuracy, particularly in forming a ſcore, where quantity muſt be attended to in the exact arrangement of the notes over each other. Muſic has long been very neatly engraved in France, on copper; and in Holland, though leſs neat, with more force and diſtinctneſs: 60 or 70 years ago, the Dutch editions of the works of Corelli were much ſought all over Europe; and 30 or 40 years ago, there was no muſic printed in Italy or Germany; all was MS. By which employment ſo many *copyiſts* obtained a livelihood, that it was thought a cruelty to ſhorten labour by the preſs; as in the firſt attempts at erecting ſilk and cotton-mills. Works in literature, till the invention of the preſs, muſt have been diſſeminated very ſlowly by tranſcription; perhaps by the medium of the preſs works of little merit, and of corrupt and noxious principles, have been too eaſily multipled, and put in circulation. And indeed cheapneſs has not been eventually the conſequence of muſical typography, ſtamping, or engraving; as printed muſic is now dearer than written was, early in the laſt century.

COPY-RIGHT. See *Literary* PROPERTY.

COQ. *ad med. conſumpt.* an abbreviature among *Phyſicians*, ſignifying that the thing is to be boiled till half of it be conſumed.—*Coq. in S. Q. Aq.* implies it to be boiled in a ſufficient quantity of common water.

COQUALLIN, in *Zoology*, the SCIURUS *variegatus* of Gmelin, and *varied ſquirrel* of Pennant.

COQUANTOTOTL, in *Ornithology*, a bird of the warmer climates of America, deſcribed by Seba under this name: it is a ſmall creſted-bird, ſhaped like a ſparrow; the PIPRA *Griſea* of Gmelin, the *manacus criſtatus griſeus* of Briſſon, and the *gray manakin* of Latham.

COQUAR, the variety *hybrida*, ε. of Gmelin's PHASIANUS *Colchicus* and the pied-pheaſant of Hayes's Britiſh birds.

COQUATOTOTL of Hernandez and Ray, the variety β. of Gmelin's AMPELIS *garrulus*, the *chatterer* of Carolina of Edwards and Cateſby.

COQUES, GONZALO, in *Biography*, a painter who was born at Antwerp in 1618, and became the diſciple of David Ryckaert the elder. He ſoon gave proofs of extraordinary talents in ſmall pictures; and the early friendſhip which he formed with the ſon of Ryckaert, whoſe name was likewiſe David, did not a little contribute to rouſe his emulation, and quicken his diligence. His firſt eſſays, after the example of his maſter, were domeſtic ſubjects and converſations, in the manner of Teniers and Oſtade; but his admiration of the works of Vandyke, ſoon cauſed him to adopt a ſtyle, in which the beautiful and pictureſque grouping of his former models acquired additional intereſt, by being united to greater elegance and dignity of character. In this manner he painted a picture for Jacques Le Mercier, a rich merchant of Antwerp, which gained him great applauſe. It repreſented his employer with his wife and children at table: the painter himſelf was introduced in profile. From this period he devoted himſelf principally to the painting of ſmall portraits, which he executed with ſuch delicacy and happy effect, that excepting Vandyke, no artiſt of his time enjoyed a greater reputation. He was employed by the court of Bruſſels, Charles I. king of England, and ſeveral other potentates. He died in 1684, leaving conſiderable riches to his family. Deſcamps.

COQUET, in *Geography*, a river of England, in Northumberland, which runs into the ſea ſeven miles S.E. of Alnwick, at Hawkſley, and is navigable for about 12 miles up to Warkworth bridge.—Alſo, a ſmall iſland of England, in the German ocean, about a mile in circumference, near the coaſt of Northumberland. It was taken by the Scots in the reign of Charles I. N. lat. 55° 13′. W. long. 1° 36′.

COQUETTE, a female character, no leſs contemptible than odious; againſt the iniquity of which Mr. Giſborne, in his excellent treatiſe, "On the Duties of the Female Sex," cautions his readers in the following deſcriptive and impreſſive terms. "To delude a young man by encouraging his attentions for the pleaſure of exhibiting him as a conqueſt, for the purpoſe of exciting the aſſiduities of another perſon, or from any motive except the impulſe of mutual regard, is a proceeding too plainly repugnant to juſtice, and to delicacy of ſentiment, to require much obſervation. On ſuch ſubjects, even inadvertence is highly culpable, what then is the guilt of her, who deliberately raiſes hopes which ſhe is reſolved not to fulfil!"

COQUILLADE, in *Ornithology*, the ALAUDA *undata* of Gmelin and *undated lark* of Latham.

COQUILLES A BOULETS, ſhells or moulds for bullets. They are made either of braſs or iron. Two of them are required for the caſting of a cannon-ball. And they never join or cloſe ſo effectually, as to prevent the liquid metal when poured in from running ſomewhat out at the ſeam, where they join. This ſmall part of the metal, or excreſcence of the bullet, is called the beard, which is broken or knocked off to make the ball perfectly round.

COQUIMBO, or LA SERENA, in *Geography*, one of the 13 provinces of Chili in South America. This is a rich, verdant fruitful valley, not far from the coaſt of the South Sea, producing corn ſufficient for conſiderable exportation to Lima, and abounding with various mines. One mine of copper, ſituated about 5 leagues N. from the town of Coquimbo on mount Carro Verde, or Green Hill, riſes to a conſiderable elevation in form of a ſugar-loaf, and ſerves as a land-mark to the port. The climate is ſingularly agreeable, being almoſt uniformly mild and ſerene.

COQUIMBO, or *La Serena*, the capital of the fore-mentioned province, was the ſecond town built by Valdivia, in the kingdom of Chili, in 1544, for the purpoſe of maintaining an intercourſe between Peru and Chili, in order to procure a regular ſupply, and to ſecure the fidelity of the Indians who lived in that valley. The town ſtands about ¼ of a league from the ſea in a moſt delightful ſituation, commanding an extenſive proſpect of the ſea, a river of the ſame name, and the country, and preſenting to view a charming variety of fields, with different kinds of grain and woods of a lively verdure. The town is large but not proportionably populous; the number of families not amounting to above four or five hundred, conſiſting of Spaniards, Meſtizos, and a few Indians. The ſtreets are conveniently wide, interſecting one another from north to eaſt, and from eaſt to weſt, ſo as to form ſquares of buildings, with intervals for gardens. The houſes are conſtructed with mud walls and covered with leaves, and each of them is provided with a large garden, planted with fruit trees and eſculent vegetables. It has ſeveral pariſh churches, and three convents, and alſo a town-houſe, where the Alcaldes and Regidores meet, who, with the corregidor, form the corporation. On the north ſide of the town runs the river; after flowing in various meanders through the whole valley of the ſame name; and, by canals cut from it, furniſhes the town with water, which is principally applied to preſerve the fertility and beauty of their gardens. The river at its mouth forms a very fine bay, where ſhips lie ſafely and commodiouſly, though the coaſt is rocky; ſome iſlands lying ſo as to keep off the winds. S. lat. 29° 52′. W. long. 71° 19′.

COR, in *Geography*, a town of Chineſe Tartary, in the deſert of Cobi. N. lat. 44° 16′. E. long. 93° 29′.

Cor, in *Anatomy*. See Heart.

Cor, *Fr.* Corno, *Ital.* in *Muſic*. A horn.

Cor *de Chaſſe* is a very long and inſtructive article in the Encycl. Meth.; but the plates, to which the reader is frequently referred, not being yet publiſhed, the precepts for performing on the inſtrument, if tranſlated, would not be intelligible.

Cor, in *Natural Hiſtory*. See Chama.

Cor *Caroli*, in *Aſtronomy*, an extra-conſtellated ſtar of the ſecond magnitude in the northern hemiſphere, ſituated between the Coma Berenices and Urſa Major; ſo called by ſir Charles Scarborough, in honour of king Charles I.

Cor *Hydræ*, a ſtar of the ſecond magnitude, in the heart of the conſtellation Hydra.

Cor *Leonis*, or *Regulus*, a fixed ſtar of the firſt magnitude, in the conſtellation Leo.

Cor *Scorpii*. See Antares.

Cor *Anguinum*, in *Natural Hiſtory*, a ſpecies of Echinus found only in a foſſile ſtate.

Cor *Bovis*. See Cardium Aculeatum.

Cor *Marinum*, the name of one of the claſſes of the *echini marini*, the characters of which are, that the anus is placed in the ſide of that point of the ſhell which appears as if cut off; and the mouth has two lips, and is placed in the third region of the axis of the baſe. Klein's Echin. p. 34.

Cor *Veneris*, *Venus's heart*. See Cardium Cardissa.

CORA, in *Ancient Geography*, a town and Latin colony of Italy, in the country of the Volſci, according to Virgil, Silius Italicus, and Livy; now *Cori*. This is a town of Latium on the left of the Appian way, S. E. of Velitræ. By its ruins we may conclude, that it was a place of importance: among theſe we diſcover a temple of Caſtor and Pollux, and an aqueduct for conducting water, &c. The ancient walls are ſtill remaining.—Alſo, a town of Italy, ſituated in a promontory of Etruria. Juſtus Lipſius ſays, that in the paſſage of Tacitus which mentions it, we ought to read *Coſa*, which is not improbable.

CORAAGE, Coraagium, in our *Old Cuſtoms*, a kind of impoſition extraordinary, growing upon ſome unuſual occaſion; and it ſeems to be of certain meaſures of corn; for *corus tritici* is a meaſure of wheat. Bracton, lib. ii. cap. 116. num. 6. who, in the ſame chapter, num. 8. has theſe words: "Sunt etiam quædam communes præſtationes, quæ ſervitia non dicuntur, nec de conſuetudine veniunt, niſi cum neceſſitas intervenerit, vel cum rex venerit; ſicut ſunt hidagia, coraagia, & carvagia, et alia plura de neceſſitate et ex conſenſu communi totius regni introducta, &c."

CORACA, or Corace, in *Ancient Geography*, a town of Arabia Petræa. Ptolemy.

CORACE, in *Geography*, a river of Naples, which runs into the gulf of Squillace; four miles ſouth of Balicaſtro.

CORACESIUM, a fortified place of Aſia in Cilicia, according to Pliny and Strabo; the latter of whom ſays, that it was ſituated on a rugged rock at the extremity of Cilicia.

CORACIAS, in *Ornithology*, a genus of the order, *Picæ*, or Pies. The birds of this genus have the bill ſharp at the edges, the tip incurvated, and the baſe bare of feathers; tongue cartilaginous and bifid; feet formed for walking.

The coracias genus comprehends only thoſe birds which are known by Engliſh writers under the title of *Roller*, amounting altogether to between twenty and thirty ſpecies. In Dr. Latham's ſynopſis it is obſerved, that the bill of the roller is ſtraight, bending towards the tip, with the edges cultrated; the noſtrils narrow and naked; and the legs for the moſt part ſhort, with the toes placed three before and one behind, the whole of which are divided to their origin. It differs from the corvus, or crow tribe, chiefly in the noſtrils being deſtitute of reflected briſtles, and having the legs ſhorter. Briſſon makes a particular genus of pies under the name of coracias, including thoſe birds of the Linnæan genus corvus which have the beak a little bent or arched. The coracias of the lateſt French writers, it may be likewiſe remarked, belongs to the corvus genus both of Gmelin and Latham, as for example, the corvus graculus (*Corniſh chough*) and corvus eremita (*Hermit crow*), &c. of the two laſt mentioned writers are referred to the coracias genus by the French.

The roller tribe is not confined to any particular part of the world like ſome other genera of birds, but the far greater number of its ſpecies are found in warm climates.

Only one ſpecies of the roller has been yet diſcovered in England, the *garrulous roller*, *coracias garrula*.

Garrula. Blue, back red; quill-feathers black. Linn. Fn. Sv. Common roller. Penn.—Donov. Brit. birds. *Pica marina et garrulus argentoratenſis*, Ray. *Galgulus*, Briſſon. *Rollier*, Buffon. *Gazza marina*, Zinan.

A beautiful bird, in ſize ſomewhat inferior to the common jay; the head, neck, breaſt, and belly are of a fine bluiſh-green, the back and ſcapulars reddiſh-brown; coverts on the ridge of the wing rich blue; the tips of the quill feathers duſky above, beneath blue; the tail forked with the two middle feathers obſcure green, the reſt blue with the tip on the outer edge black; legs ſhort and dirty yellow.

This ſpecies inhabits various parts of Africa, and Europe, but in greateſt numbers in the warmer regions; in the north of Europe they are uncommon, in England very rare. It has obtained the name of garrulous roller in alluſion to its chattering noiſe. The ſpecies is of the migratory kind, gregarious and timid, and builds in trees, particularly the beech. In the ſouth of Germany it is ſeen in flocks in autumn, in company with the rooks and other birds ſearching for worms, ſmall ſeeds and roots, in tilled, or cultivated grounds.

Bengalensis. Somewhat fulvous, beneath bluiſh; neck beneath violet with paler ſtreaks; tail entire. Lath. *Coracias bengalenſis*, Linn. *Galgulus mindanoenſis*, Briſſ. *Rollier de Mindanao*, Buff. *Le cuit*, ibid. Jay from Bengal, or Bengal Pye, Albin. *Bengal roller*, Lath.

Inhabits Bengal and the iſle of Mindanao. Dr. Latham obſerves that it does not eſſentially differ from the following ſpecies, the chief difference being the rufous violet colour on the breaſt, and the want of the long outer tail-feathers. The bengalenſis, he thinks, may be perhaps the female or a young bird, as the long tail-feathers of coracias caudata do not appear till the ſecond year. Lath. Gen.

Syn. In Ind. Orn. of the ſame writer, ſince publiſhed, theſe two birds are conſidered as diſtinct ſpecies.

Caudata. Somewhat fulvous, beneath blueiſh; neck beneath violet, ſtreaked with paler; the outer tail-feathers very long. Linn. *Galgulus angolenſis*, Briſſ. *Rollier d'angola*, Buff. *Long-tailed roller*, Lath.

A native of Angola, and meaſures fifteeen inches and a half in length.

Senegala. Reddiſh fuſcous; beneath, head, tail, and upper part of the wings blueiſh ſea-green; face white, ſhoulders and quill-feathers blue; exterior tail-feathers very long. Lath. *Coracias ſenegalenſis*, Gmel. *Rollier de Senegal*, Buff. *Swallow-tailed Indian roller*, Edwards. *Senegal roller*, Lath.

This is rather leſs than the common jay. The bill black; the whole ſpace round the baſe of the bill white; head and under parts of the body, the upper parts of the wings, and tail, blueiſh-ſea-green; ſhoulders and quills deep blue; the outer tail-feathers of great length as in the laſt ſpecies; hind part of the neck, and the back of a reddiſh-brown; the legs of a reddiſh-fleſh-colour. It inhabits Ceylon and Senegal.

Abyssinica. Rufous-brown; head, neck, body beneath, and wing-coverts green; ſhoulders, greater quill-feathers, and rump blue; outer tail-feathers very long. Lath. *Coracias Abyſſinica*, Gmel. *Rollier d'Abyſſinie*, Buff. *Abyſſinian roller*, Lath.

The bill of this bird is black; tip of the upper mandible much bent; ſides of the head from the noſtrils to a little beyond the eyes are white; the reſt of the head, neck, and under parts of the body fine green; the two middle feathers of the tail are duſky, with a gloſs of blue eſpecially down the middle, the outer ones blue-green: the two exterior tail-feathers are five inches longer than the reſt, and the end, beyond the extremity of the others, of a fine deep blue; the legs are red-brown. A native of Abyſſinia.

Orientalis. Green; throat ſtriated with blueiſh; tail-feathers black at the tip. Lath. Linn. *Galgulus indicus*, Briſſ. *Rollier des Indes*, Buff. *Oriental roller*, Lath.

A native of the Eaſt Indies. Its ſize is that of a jay, the length ten inches and a half; the bill yellowiſh, broader at the baſe, and more hooked than in any of the genus; the head and hind part of the neck brown; back, rump, and ſcapulars, with the wing and tail-coverts, green-brown; throat fine blue; down the ſhaft of each feather a pale line, the other parts beneath blue-green; quills blue and black, with a large pale blue ſpot. The wings are longer than in the other ſpecies of roller; the tail even at the end, the two middle feathers green at the baſe, with the other part black; legs yellowiſh with black claws.

Indica. Blue, fore-part teſtaceous; cap green. Linn. *Blue jay* from the Eaſt Indies. Edwards. *Indian roller*, Lath.

The length of this bird is eleven inches. The bill is duſky, an inch and a half in length; the crown of the head blue-green; throat, breaſt, neck, and back, reddiſh-brown, with the ſides of the head and throat darkeſt, ſtreaked with white; rump and tail, with the under-parts from the breaſt, fine cyaneous blue; the middle feathers of the tail green, the outer ones blue at the bottoms and tips, in the middle ſea-green; the wings green and blue. A native of Ceylon.

Caffra. Blue, exterior edge of the quill-feathers pale-yellow. Linn. *Cape roller*, Lath. Inhabits Ethiopia; an obſcure ſpecies deſcribed on the authority of Linnæus.

Vivida. Entirely of a moſt vivid blue. Lath. *Coracias cyanea*, Gmel. *Ultramarine roller*, Lath.

Length of this ſpecies eight inches; the bill duſky. Native place unknown.

Madagascariensis. Purple-brown; rump, vent, and tail blueiſh-green; tail towards the tip marked with a purpliſh band, tip and quill-feathers dark blue. Gmel. *Rollier de Madagaſcar*, Buff. *Madagaſcar roller*, Lath.

A beautiful ſpecies found in Madagaſcar. The length of this bird is ten inches; the bill is very ſtout at the baſe, rather ſhort and of a yellow colour; the legs reddiſh-brown.

Mexicana. Reddiſh-grey; beneath and on the wings pale grey mixed with flame colour. Gmel. *Galgulus mexicanus*, Briſſ. *Merula mexicana*, Seba. *Rollier de Mexique*, Buff. *Mexican roller*, Lath.

Larger than a thruſh, and inhabits Mexico.

Puella. Blue, collar in front, and at the ſide, with the breaſt, belly, quill-feathers, and greater wing-coverts black. *Fairy roller*, Lath.

Size of a blackbird, and inhabits India.

Striata. Blue-black, ſtreaked with greeniſh-blue; bill, tail, and legs, black. Lath. *Coracias ſtriata*, Gmel. *Blue-ſtriped roller*, Lath.

The length of this bird is eight inches. The female cinereous-grey and not ſtreaked like the male; quill-feathers black, edged with cinereous; irids pale red. A native of New Caledonia.

Sinensis. Green, beneath yellowiſh-green, tail cuneated, and white at the tip. Gmel. *Galgulus ſinenſis*, Briſſ. *Rolle de la Chine*, Buff. *Chineſe roller*, Lath.

Inhabits China, and is called at Canton Sau-ta-hoang. The ſize is that of a jay, the length eleven inches and a half; the bill and irids are red; head, and hind part of the neck, back, rump, and upper tail-coverts green; through the eyes on each ſide is a black ſtripe; the underparts from the chin to the vent yellowiſh-white tinged with green; wing-coverts olive-brown; quills the ſame with a mixture of cheſnut in ſome, and others tipped with white; the tail reſembles that of a magpie in form, and is marked at the tip of every feather with a white ſpot; the legs and claws are pale red, and longer than in other rollers.

Vagabunda. Head and neck black; body above ferruginous-brown, beneath cinereous; middle of the wing white; tail very long, wedge-formed, greyiſh with the tip black. Lath. *Grey-tailed roller*, Lath.

This is a native of India; the length is ſeventeen inches; its bill black; legs cinereous; leſſer wing-coverts ruſty brown; greater and ſecondary quill-feathers white, the primary ones black.

Cayana. Tawny-green; beneath dirty white; eyelids white; chin with a black ſtreak each ſide; tail cuneated. Gmel. *Grivert, ou rolle de Cayenne*, Buff. *Cayenne roller*, Lath.

Inhabits Cayenne, and meaſures about nine inches in length, the bill is reddiſh; legs long and grey.

Docilis. White interſperſed with reddiſh; beneath cheſnut; legs pale yellow; tail-feathers black with the tips white. Gmel. *Docile roller*.

Size of a blackbird, and inhabits the ſouthern parts of Aſia. The bill is yellow; the nine firſt quill-feathers white as far as the middle and from thence black, the reſt entirely black; claws fleſh colour.

Nigra. Body and limbs entirely black; tail long. Gmel. *Black roller*, Lath.

Length ſixteen inches; bill thick, and with the legs black; tail ſeven inches. Native country unknown.

Afra. Teſtaceous red; beneath reddiſh-purple; vent blue-green; wing and tail-feathers blue, with the tips blackiſh. Gmel. *African roller*, Lath.

Length eight inches and a half; the body ſtout, bill yellow; legs brown. A native of Africa.

Melanocephala. Blue-purple; head and neck black; body beneath white; quill-feathers fuſcous; tail cuneated and white at the tip. Gmel. *Black-headed roller*, Lath.

Size of a crow, bill and legs red; nape pale grey; two middle tail-feathers blue, the reſt purpliſh, and the whole white at the tip. Inhabits China.

Strepera. Black; ſpot on the wings, vent, baſe, and tip of the tail black. Lath. *Noiſy roller*.

This is an inhabitant of Norfolk iſland in the Pacific ocean, where it occurs in vaſt numbers; it has the reputation of being a ſilly bird, and is very noiſy in the night. The length is nineteen inches, of which the bill is two inches and a half long, ſomewhat ſtraight, black, denticulate, and horn-coloured near the tip; noſtrils naked, long, and placed near the baſe of the bill. The firſt ſix quill-feathers are white at the baſe; the tail long and rounded, the larger feathers white at the baſe, the lateral ones white at the tips within. When the wings are folded they reach as far as the middle of the tail. The legs are black, the outer toe connected at the baſe to the middle one.

Varia. Black; beneath, lower part of the back, rump, and upper tail coverts white; tail black, equal, with the tips of the feathers white. Gmel. *Caſſican de la Nouvelle Guinée*, Buff. *Pied roller*, Lath.

Length about thirteen inches; the bill two inches and a half long, and of a blueiſh colour with the tip dark; legs lead colour. A native of New Guinea. This bird partakes of characters common to the oriolus, coracias, and ramphaſtos genera, and might with ſome propriety be referred to either. In the index ornithologicus it is placed with the coracias tribe.

CORACINSII, in *Ancient Geography*, a people who inhabited the northern part of the iſle of Sardinia.

CORACINUS, in *Ichthyology*, the name of a ſea-fiſh caught in the Mediterranean, and called by ſome authors *ſkiæna*, and by Aldrovand and Salvian *umbra*. It is of the colour of the common tench, but in figure more approaches to the perch: its ſcales are ſmall; its mouth not very large, but well furniſhed with teeth; and its tail is not forked, but when extended, ſeems of a roundiſh figure; the ends of the rays or nerves of the tail-fin are black, and the other fins are all black, and ſeem as if dyed with ink.

Coracinus *Braſilienſis*, the Labrus *Cromis* of Gmelin, and *Guatucupa* of Marcgrave. Found in Carolina.

CORACIUS Mons, in *Ancient Geography*, a mountain of Aſia Minor in Jonia, ſituated near the town of Colophon. Strabo.

CORACLE, a fiſhing boat of curious conſtruction uſed in Wales for time almoſt immemorial. Theſe boats afford a ſpecimen of the earlieſt Britiſh navigation, and they are uſed at this time on many of the rivers in Wales, probably without any deviation from their original form. They are made with very ſtrong baſket-work, and covered with hides, or coarſe canvas, with a thick coating of pitch. Their ſhape is oval and reſembles the ſection of a walnut-ſhell, their length is generally five feet, and their breadth ſeldom leſs than four. They contain only one perſon, who ſits preciſely in the middle, and by dextrous management maintains his juſt balance. The inſtrument with which he moves his boat is a paddle; one end of which reſts upon his ſhoulder, and the other is employed by his right hand, in making a ſtroke alternately on each ſide. The left hand is, in the mean while, employed in conducting the net, and he holds the line between his teeth. Theſe veſſels were anciently uſed, as the means of intercourſe between the inhabitants on the oppoſite banks of the rivers. They are now applied only to the purpoſe of fiſhing. So frail an invention would probably have been ſucceeded by ſomething of greater ſtrength and capacity, had not there been found a remarkable convenience in their lightneſs. The fiſherman, when his labour is finiſhed, flings his boat acroſs his back, and marches homewards under the burden of his machine and booty. There is ſcarcely a cottage in the neighbourhood of the Tivy in South Wales, or ſeveral other rivers in thoſe parts, abounding with fiſh, that has not its coracle hanging by the door. Such is the adroitneſs of thoſe who uſe them, that they are very rarely overturned on lakes or rivers; and they ſometimes even venture a little way out to ſea, when the weather is perfectly calm. Similar to theſe in their nature are the Indian canoes; though they are conſtructed of different materials and forms, and applied to different purpoſes.

CORACOBRACHIALIS, in *Myology*, a muſcle of the ſhoulder-joint, ariſing by a tendinous and fleſhy origin from the apex of the coracoid proceſs of the ſcapula, and connected for ſome extent with the ſhort head of the biceps. It paſſes downwards and backwards, to be inſerted into the inner ſide of the os humeri about the middle of the bone. The muſculo-cutaneous nerve generally penetrates the fibres of the muſcle; whence it has been called the muſculus perforatus Caſſerii. It will move the os humeri towards the ſide; it will elevate the bone, and carry it obliquely forwards acroſs the front of the cheſt. It may rotule the os humeri outwards, particularly if that bone has been previouſly turned inwards.

CORACODES, in *Ancient Geography*, a port of the W. coaſt of the iſland of Sardinia. Ptolemy.

CORACOHYOIDEUS, in *Myology*, a term applied to the omohyoideus muſcle, for which ſee Larynx.

CORACOIDES, in *Anatomy*, a ſmall ſharp proceſs of the ſcapula; ſo called from its reſembling a crow's bill.

The word comes from κοραξ, *corvus*, and ειδος, *imago*.

The coracoides is placed in the upper part of the neck, and projects over the head of the bone of the arm. It ſerves to ſtrengthen the articulation of the ſhoulder; and gives origin to one of the muſcles of the arm.

CORACOMANTES, from κοραξ, *crow*, and μαντεια, *divination*, in *Antiquity*, a kind of diviners, who made their predictions by obſerving the crows.

CORACONESUS, in *Ancient Geography*, an iſland of the Mediterranean ſea, towards the coaſts of Libya. Steph. Byz.—Alſo, a place of Peloponneſus, in Arcadia; ſituated, according to Pauſanias, where the river Ladon diſcharged itſelf into the Alpheus.

CORACORADIALIS, a name given by Winſlow to the biceps flexor cubiti. See Biceps.

CORADI, or Curadi, Ottavio, in *Biography*, a Bologneſe painter, the ſcholar of Giacomo Cavedone. His principal excellence conſiſted in the boldneſs and truth with which he copied the works of his maſter. He flouriſhed in 1630, and is ſaid by Pilkington to have died in 1643. Malvaſia, Orlandi.

CORAH, or Corah-Jenehabad, in *Geography*, a ſmall city of Hindooſtan, or capital of a province in the Dooab, or country between the rivers Ganges and Jumnah; ſubject to the nabob of Oude; 184 miles S.E. of Agra, and 67 S.S.W. of Lucknow. N. lat. 26° 10′. W. long. 80° 50′. When lord Clive aſſumed the government of Bengal, in 1765, he reſtored to Sujah Dowlah all the conqueſts that had been gained from him, except the provinces of Corah and Allahabad, which were reſerved as part of an eſtabliſhment for the emperor, or great Mogul. The Corah provinces were valued at 30 lacks. The emperor was to reſide at Allahabad, under the protection of the Engliſh, to whom, in reality, he owed all that he poſſeſſed; and a treaty offenſive and defenſive was entered into with Sujah Dowlah, nabob of Oude. The ambition of the emperor was not ſatisfied; but after about ſix years quiet reſidence at Allahabad, he put himſelf into the hands of the Mahrattas, who promiſed to ſeat him on the throne of Delhi. The immediate conſequence of this connexion was a ceſſion of the Corah provinces to the Mahrattas, who, unleſs the Engliſh had interpoſed, would have eſtabliſhed themſelves in that important angle of the Dooab, which commands the navigation of the upper part of the river Ganges, and the whole courſe of the Jumnah. On this occaſion, the Britiſh government conſidered the Corah, &c. provinces, which, by right of conqueſt, were originally theirs, as having reverted to them again, when they were alienated from the purpoſes for which they had been originally granted to the emperor; and applied to the aggrandiſement of a power inimical to them and their allies. They, therefore, reſumed the poſſeſſion of theſe provinces, and immediately ceded them to the nabob of Oude, for a valuable conſideration. See OUDE.

CORAL, in *Botany*, *arbor non ſpinoſa*; Pet. Rai. See ERYTHRINA *criſta galli*.

CORAL *arbori affinis*; Sloan. See SOPHORA *occidentalis*.

CORAL *arbor americana*; Com. See ERYTHRINA *corallodendrum*.

CORAL *carolinenſis*; Dill. See ERYTHRINA *herbacea*.

CORAL *arbor polyphylla*; Sloan. See PISCIDIA *erythrina*.

CORAL, in *Zoology*, a general Engliſh name for zoophytes of the Iſis tribe, or thoſe whoſe animal reſembles a plant, and have the ſtem ſtony and articulated; with the joints longitudinally ſtriated, united by ſpongy or corneous junctures, and covered by ſoft porous cellular fleſh. About ſix ſpecies of this curious genus are at preſent known. See ISIS.

CORAL, *red*, or true red coral, was conſidered by Linnæus as an iſis, and arranged as ſuch in the Syſtema; though Linnæus himſelf acknowledged to Mr. Ellis, the author of the Natural Hiſtory of Zoophytes, that the latter had more properly claſſed it with the gorgonia, or ſea-fan, the genus iſis being ſufficiently diſtinguiſhed by its jointed ſtem. In the laſt edition of the Syſtema, the coral is placed with the ſea-fans, or gorgonia.

The red coral grows in an expanded and ſomewhat flattened form, with dichotomous branches, that leſſen towards their extremities. The fleſh is of the colour of red lead, or inclining to vermilion, ſoft, ſlippery, and full of minute veſſels. The mouths are placed on the ſurface, and riſe up in a conical form, conſiſting of eight valves, juſt opening, from whence proceed polypes of a white colour, with eight claws, each of which has a double fibre at both edges. The bone itſelf, diveſted of the fleſh, is the true coral of the ſhops, and which, in its natural ſtate, is of a ſtony texture, and of a bright red colour, with the outſide marked with minute furrows, or irregular ſtriations, interſperſed with a few ſlight depreſſions, correſponding with the ſituation of the ſhells, before the fleſh be removed. For a further account of this curious article, ſee GORGONIA *nobilis*.

CORAL, *black*. In the Linnæan ſyſtem, the true black coral is deſcribed as appertaining to the ſame genus of zoophytes as the red kind, under the ſpecific name of antipathes. This ſort is found on the ſhores of the Indian and Mediterranean ſeas, and grows in a ſhrubby form to the height of about two feet, with the branches erect, and alternately panicled. The bone is of a black colour, marked on the outſide with flexuous ſtriæ, and in its native ſtate is covered with fleſh of a grey colour. See GORGONIA *antipathes*.

The gorgonia antipathes, or true black coral, muſt not be confounded, from the ſimilarity of names, with the antipathes genus, the latter being very diſtinct, although its ſpecies are not unfrequently denominated black corals, as well as the gorgonia before-mentioned. There is a great affinity between the antipathes and gorgonia genera; notwithſtanding which they may be readily diſtinguiſhed, the bony part of the antipathes being beſet with ſmall ſpines, and covered with gelatinous fleſh, and numerous polype-bearing tubercles, while the bone of the gorgonia is ſmooth, or deſtitute of ſpines, and the fleſh cellular.

From the old botanical writers it appears, that many of the zoophytes were conſidered as genuine plants; and that in particular ſeveral ſorts of black corals were formerly called antipathes. But as the characters of theſe marine bodies are better underſtood in the preſent age, only part of theſe have been retained in the genus antipathes, and ſome of the reſt referred to the gorgonia. The antipathes of certain kinds were formerly uſed as ſceptres for princes, and likewiſe for divining rods, and other ſimilar purpoſes, as is evident from the remarks of Salmaſius, addreſſed to Solinus, wherein he ſays, that antipathes denotes ſomething proper to reſiſt incantations, and that they were in uſe for that purpoſe by ſeveral Indian nations.

There are a number of different ſpecies of this kind of black coral, which, not being ſufficiently noticed under the article antipathes, it may be proper to deſcribe in this place.

SPIRALIS. With a very ſimple, ſpiral, rough ſtem. *Antipathes ſimpliciſſima attenuata flexuoſo-ſpiralis ſpinulis ſeriatis ſcabra* of Pallas. *Gorgonia ſpiralis*, Linn. *Palmjuncus anguinus*, Rumpf.

This kind inhabits the Indian, Mediterranean, and North ſeas. It is of a hard and horny black ſubſtance, extremely brittle, and varying in length and thickneſs; one deſcribed by Mr. Ellis meaſured two feet long, and was about the thickneſs of a writing-pen; another, not thicker at the baſe than the quill of a hen's feather, was ſeven feet in length. In its natural ſtate this kind is variouſly twiſted, or generally in a ſpiral manner, and the fleſh which covers the ſpiny ſurface of the bone is full of little gelatinous warts.

ULEX. Very much branched, with ſcattered ſpreading rough and pointed branches. *Furze-like antipathes*, Soland. and Ellis.

A native of the Indian ocean. This kind is full of ſmall ſhort ſpines, the branches are looſe and irregular, and the whole remarkably black. The ſpecimen brought from Batavia, and deſcribed by Mr. Ellis, had the ſurface marked with ovate cavities, diſperſed about the branches, which were of a browniſh-yellow colour, and ſuppoſed to be the ovaries.

SUBPINNATA. Branched and pinnated, rough with ſetaceous alternate ſub-diviſions, and a few others proceeding tranſverſely from them. Soland. and Ellis.

Deſcribed by Gmelin as a native of the Mediterranean ſea on the authority of Ellis, who, however, merely informs us his ſpecimen was brought from Gibraltar, and is ſuppoſed to be taken in the ſea thereabouts. The ſpines of this kind are long and ſmall, and of an amber colour when magnified. The ſurface of the antipathes appears to be cinereous.

MYRIOPHYLLA. With numerous, incurved, pinnate branches, the ſubdiviſions with leſſer ſpinous pinnules on the upper ſide. Soland. and Ellis. *Myriophyllum indicum ramoſiſſimum*, Petiv. *Erica marina tenuis*, Rumpf.

This is called by Ellis the yarrow-leafed antipathes; it is of a beautiful ſhrub-like appearance, with many pinnated branches, bending downwards all round; the colour yellowiſhlowiſh-brown, and the ſurface rough, but conſiderably leſs ſo than the ſpecies ſubpinnata. Found near the Spice iſlands.

ALOPECUROIDES. With ſpinous, ſetaceous, cloſely panicled branches. Soland. and Ellis. *Fox-tail antipathes.*

The trunk of this ſpecies riſes from a broad ſpreading baſe, and divides immediately into ſeveral large branches, of about one-third of an inch in diameter. As they riſe up, one ſide of them appears flat, with a groove or channel along the middle of it, where there are the remains of many little branches that have grown in rows on each ſide. It then divides into branches, and often into other branches, all which are in form of cloſe panicles, not unlike the fox-tail graſs. Theſe panicles are compoſed of very rough thorny minute branches, which are twice as long on one ſide of the ſtem as the other. This riſes to the height of two feet, and is of a greyiſh colour on the outſide, the inſide black and very brittle. A rare ſpecies, diſcovered on the coaſt of South Carolina.

CUPRESSUS. Growing in the form of a ſimple rough panicle, with recurved branches. Soland. and Ellis. *Antipathes cupreſſina*, Pallas. *Gorgonia abies*, Linn. *Cupreſſus marina*, Rumpf.

The cypreſs antipathes was erroneouſly claſſed by Linnæus with the gorgonia; Gmelin places it with the antipathes. The ſpecies inhabits the Indian ocean; it is about two feet in length, and is covered with a browniſh-down, beneath which the colour is deep black.

DICHOTOMA. Very long, dichotomous, and upright. Pallas.

Inhabits the Mediterranean, is about two feet in height, round, and duſky.

ORICHALCEA. Braſſy, ſmooth, with a ſimple, rigid, flexuous ſtem, and alternate, ſcattered, dichotomous branches. Pallas. *Gorgonia ænea*, Linn.

Twelve inches in length, and very rigid. A native of the Indian ocean.

CLATHRATA. Very much branched, intricate, with confuſed ſub-diviſions in every part coaleſcing, the younger ones ſetaceous. Pallas.

Size of the laſt, and of a black colour within: this inhabits the Indian ocean.

FLABELLUM. Dilated, very ramoſe, and ſub-divided, the ſub-diviſions branching both ways, and cohering together in a reticulated manner. Pallas. *Erica marinæ affinis*, Rumpf.

This kind inhabits the Indian ſea, and is about ſix inches wide, black, rough, and undulately curved.

PENNACEA. Branched, ſomewhat incurvated, the branches with ſetaceous and very crowded rough ſub-diviſions. Pallas. *Accabaar rutturuttu*, or *Erica marina craſſa*, Rumpf. *Peucites priſma*, Aldr.

Inhabits the Indian ocean, the outſide grey and rough, within black.

ERICOIDES. Very much branched, rough and black, with ſcattered branches, covered throughout with ſubulate ſub-diviſions. Pallas. *Cupreſſus marina prior*, Rumpf.

A ſpecies about a foot high, and of a deep black colour; an inhabitant of the Indian ocean.

FOENICULACEA. Very much branched, with ſetaceous decompoſite ſub-diviſions. Pallas. *Fœnum marinum*, Rumpf.

Twelve inches high, the colour black. A native of the Mediterranean.

CORAL, *white*. See MADREPORA, MILLEPORA, and CELLEPORA.

CORAL gives title to an officinal compoſition, called *ſyrup of coral*, ſometimes preſcribed by phyſicians; as is likewiſe the powder of coral finely ground, and afterwards levigated on a marble, and made up into a proper form. But there are few, except thoſe who are fond of medicines with gems in them, that make uſe of it. By means of its exceeding hardneſs, it is ſuſpected to take away with it a great deal of the levigating ſtone.

Diſpenſary writers have given us receipts for a great many preparations of coral, as magilteries, tinctures, ſalts, &c. none of which enter the preſent practice.

Coral and coralline being the ſhells of marine animals of the polype kind, poſſeſs the ſame chemical properties as the freſh ſhells of oyſters and other ſhell fiſh, *i. e.* they are calcareous earths impregnated with ſome animal principles.

CORAL, *artificial*, is made of cinnabar well beaten; a layer whereof is applied on a piece of wood well dried, and poliſhed, firſt moiſtened with ſize: the whole is then again poliſhed; and for varniſh, rubbed over with the white of an egg. See GROTTO.

CORAL-*fiſhery*. The time for fiſhing coral is from April to July; the places are the Perſian gulf, the Red ſea, coaſts of Africa towards the baſtion of France, the iſles of Majorca and Corſica, and the coaſts of Provence and Catalonia.

The method of fiſhing is nearly the ſame in all places: that uſed at the baſtion of France, where there is an eſtabliſhed fiſhery, under the direction of a company at Marſeilles, is as follows.

Seven or eight men go in a boat, commanded by the patron or proprietor; the caſter throws his net, if we may ſo call the machine wherewith he uſes to tear up the coral from the bottom of the ſea: and the other ſix manage the boat. The net is compoſed of two beams tied acroſs, with a leaden weight to preſs them down; to the beams is faſtened a great quantity of hemp looſely twiſted round, among which they mix ſome ſtrong nets. In this condition the machine is let down into the ſea; and when the coral is pretty ſtrongly embarraſſed in the hemp and the nets, they draw it out by a rope, which they unwind according to the depth, and which ſometimes requires half a dozen boats to draw. If the rope happen to break, the fiſhermen are in great danger of drowning. They have two machines, one for fiſhing up the coral where the bottom is ſmooth; and the other, called in the Provençal language the *ſalabre*, ſo conſtructed as to be employed where the bottom of the ſea is rocky and unequal.

Before the fiſhermen go out, they agree on the price of the coral, which is ordinarily at the rate of 4*s.* 6*d. per* pound.

When the fiſhery is over, which in a ſeaſon uſually amounts to twenty-five quintals of coral each boat, it is divided into thirteen parts; the patron whereof, or maſter coraller, has four, the caſter two, and each of the ſix companions one: the thirteenth being reſerved for the company, &c.

Spallanzani has particularly deſcribed the coral-fiſhery in the ſtrait of Meſſina. (Travels in the two Sicilies, &c. vol. iv. p. 308.) This, he ſays, is both a laborious and dangerous occupation. The inſtrument, with which they force the branches of coral from the rocks, is formed with two poles of wood, croſſing each other at right angles, and having a piece of a net faſtened on the under ſide to their extremities. A large ſtone is fixed where the poles croſs each other, that the inſtrument may more readily ſink to the bottom. A cord is ſtrongly tied round the middle of it, one end of which the fiſherman holds in his hand, guiding by it the net to thoſe places where the coral is ſuppoſed to grow; and which is incloſed, in the pieces of the net, broken off, and drawn up. This fiſhery is carried on from the entrance of the Faro to the part of the ſtrait oppoſite to the church of the grotto, or through a tract ſix miles in length, and to the diſtance of three miles from Meſſina. The rocks which produce the coral are ſituated almoſt in the middle of the ſtrait, at different depths, from 350 to 650 feet. The bottom and caverns of the rocks are the places from which they endeavour to bring up the coral with their nets; and it is a conſtant obſervation, that every branch is perpendicular to the plain on which it grows, without ever turning on one ſide. Coral, it is ſaid, grows more plentifully in places ſituated to the eaſt than in thoſe to the ſouth; it is rarely found to the weſt, and never to the north. In the firſt ſituation it is larger, and of a finer colour, than in the ſecond and third; which two valuable qualities are likewiſe found in that which is brought from a leſs depth, compared with that which is grown at a greater. The greateſt height to which it grows is never a foot, and its uſual thickneſs is that of the little finger, and ſomewhat leſs than that of the coaſts of Trapani and Barbary; but the latter are exceeded by the Meſſineſe in vividneſs of colour. Theſe differences, according to the account of the fiſhermen, ariſe from their coral being produced in a ſea which is kept in continual agitation, from the ſurface to the bottom, by the current and the winds. With reſpect to colour, there are three kinds; the red, the vermilion, and the white coral. The firſt is ſubdivided into the deep crimſon-red, and the lighter red. The vermilion is extremely rare, but the white common. In the white they include the clear white and the dull white.

The coral fiſhermen have divided the whole tract in which they fiſh into ten parts. Every year they fiſh only in one of theſe parts, and do not fiſh in it again till ten years are elapſed. This interval of ten years they think neceſſary for the coral to acquire its full growth in height and conſiſtence. When they tranſgreſs this law, they find, in fact, the coral ſmaller, and of leſs conſiſtence, and the intenſity of the colour is always in proportion to the number of years they have deſiſted from fiſhing. When the ten years have elapſed, they believe that the coral no more increaſes in height, but only in thickneſs, which, however, has its limits. In fact, they have obſerved that the coral fiſhed up near San Stefano, a place where none had been ſought for in the memory of man, though it was of a very bright colour, was not higher than the ordinary coral, though it exceeded it by one-third in thickneſs.

The number of ſhips which uſually go together in this fiſhery is eighteen or twenty, each of which is uſually managed by eight men. The quantity of coral procured may amount every year to twelve Sicilian quintals. The quintal, as is well known, contains two hundred and fifty pounds, and the pound twelve ounces. The gain acquired is therefore adequate to the labour; yet may the fiſhery be conſidered as a ſecondary occupation, ſince the fiſhermen only follow it when they have no other employment by which they can make a greater profit. Spallanzani examined the branches of coral, as they were taken out of the nets, by putting them into glaſs veſſels filled with ſea-water. It is well known that, in this caſe, the white polypi will come out of their cells in the coral as ſoon as the water is perfectly at reſt. He examined and re-examined theſe polypi, as it was the firſt time he had ſeen them; but he diſcovered nothing which can make any addition to the accurate obſervations of Peyſſonel, Juſſieu, Guettard, Donati, and the very recent remarks of the celebrated Cavolini, which ſeem to leave nothing to be deſired to complete our knowledge of theſe animalcula, and their natural habitudes. Having made ſome additions and corrections to the obſervations of count Marſigli, relative to this ſubject, he proceeds to deſcribe the principal of thoſe branches, which now make a valuable addition to the claſs of Zoophyta in the imperial muſeum at Paris. He obſerves, 1. That the bark of this branch has the colour of ſealing wax; but the ſolid coral is purple, with ſome tranſparency at the extremity of the branches.

2. The bark in colour reſembles that of the foregoing; but the included ſolid coral is of a leſs vivid red.

3. The bark is of a blueiſh grey; the ſolid coral grey, with a ſlightly reddiſh tinge.

4. In this ſpecimen four branches ſhoot from the ſame ſtem; two of a pale red in the bark, and a whitiſh red in the ſolid coral. In the fourth the bark is of a whitiſh colour, and the ſolid coral ſtill whiter.

5. Three branches joining in one, the colour of which, both in the bark and the ſolid coral, is a milky white.

With reſpect to the ſtructure of the cortical and ſolid parts of the white corals, he obſerves that they are the orifices of the cells in the bark of the white coral, which being octoradiated like thoſe in the red, appears to be a proof that the polypi in both are of the ſame ſtructure, and conſequently of the ſame ſpecies; the polypi inhabiting the red coral having likewiſe eight tentacula. That coral is ſoft in the ſea, but hardens when it comes in contact with the air, was the opinion of the ancients; but has been proved falſe by the obſervations of the moderns. The coral-fiſhermen of Meſſina, who derive all their knowledge from experience only, are convinced this opinion is erroneous; but they aſſert that coral which has not attained maturity has not that degree of conſiſtence it acquires when it has arrived at its full growth. The truth of this poſition Spallanzani was not able to aſcertain, as, for that purpoſe, it would have been neceſſary to caſt the net in one of thoſe ten parts of the ſtrait in which it is prohibited by the law to fiſh till the expiration of the ten years preſcribed. Yet the rules of analogy derived from what is obſerved in all animals and vegetables, incline him to favour this opinion. It is agreed however by the fiſhermen on the coaſts of Barbary, and alſo by thoſe of Meſſina, Sardinia, and Corſica, that the deeper they deſcend into the ſea, the ſmaller is the coral. Donati obſerves, that the broken and detached branches of coral will continue to live and multiply in the ſea; and this Spallanzani allows to be the caſe, provided they meet with a firm point of ſupport to which they can attach themſelves with their viſcous humour. Otherwiſe, if they fall on the moveable ſand, they become the ſport of the waves, and he has no doubt but they muſt periſh. The fiſhermen, with whom Spallanzani converſed, appeared to be well acquainted with the true generation of coral; as they told him that they had frequently obſerved, on hard matters drawn from the bottom of the ſea, the firſt principles of coral beginning to germinate; which they deſcribe as having the appearance of a red ſpot, with a button or bud implanted in thoſe matters, ſometimes tender and fragile, and ſometimes hardened, and of the colour and nature of ordinary coral.

They were likewiſe acquainted with thoſe branches of coral which, when fiſhed up, are ſometimes found perforated by lithophagous worms, and which are mentioned by Vitaliani and Marſigli. Their nets had frequently brought them up, either from the bottom of the ſea, from caverns, or the ſides of rocks; and theſe perforated corals were found ſometimes broken in the trunk, where the perforations are moſt frequent; and at other times attached to ſome body which ſerved them as a baſe. They were of opinion that theſe corals were thus perforated, becauſe they were dry; and this dryneſs, they imagine, proceeds either from age, or their having been broken from their root by ſome fiſh, or by a part of a rock falling on them; or poſſibly by the coral nets, which do not always bring up all the branches of coral they tear away from their roots.

CORAL *iſlands*, in *Geography*, called by the Spaniards in their old charts *los corales*, or *iſles del coral*, three iſlands lying in the form of a triangle and ſituated S.W. of the Ladrones, in the Eaſt Indian ocean.

CORAL *river*, a river of New Mexico which runs a W. by S. courſe and diſcharges itſelf into the head of the gulf of California, near the mouth of the Collerado river.

CORAL-*tree*, in *Botany*. See ERYTHRIMA CORALLODENDRUM.

CORAL-*wort*. See DENTARIA BULBIFERA.

CORALARIA, *parvifolia*; Rumph. See ADENANTHERA PAVONINA.

CORALIS, in *Ancient Geography*, a marſh of Aſia, in Lycaonia, placed by Strabo in the vicinity of Galatia.

CORALIUS, a river of Greece, in Bœotia.

CORALLA, a place of Aſia, in Cappadocia, on the Euxine ſea, according to Arrian's Periplus.

CORALLI, a people of European Sarmatia, who inhabited the banks of the Euxine ſea, towards the Danube.

CORALLINA, in *Zoology*, a genus of zoophytes, the animal of which is of a plant-like form, with the ſtem fixed, and the branches ſubdivided, calcareous, and moſtly jointed.

The ancient naturaliſts miſtook corallines for a particular tribe of plants, and accordingly introduced them into their works under the title of marine moſſes. Tournefort enumerates thirty-ſix ſpecies among his plants; and indeed certain kinds appear to be ſo nearly allied to the lichen family, that ſome continental botaniſts, even in the preſent day, are in doubt where to draw the exact limit between the cryptogamia and the corallina.

All the corallines adhere to rocks or other ſolid bodies, and are concretions formed by the polype animals which inhabit them, the coralline itſelf being only the habitation of theſe creatures. The branches are commonly elevated, of a ſhrub-like form, and exhibit an elegant appearance from the ſymmetry and general proportions of their reſpective articulations; the branches being compoſed of little joints, like beads ſtrung in a necklace. The joints conſiſt of a calcareous and gelatinous matter, and have the ſurface perforated, or full of minute pores, which in many ſpecies are ſo very ſmall as to be viſible only with the aid of glaſſes. It is in theſe minute cells that the polypes reſide, and through which they either protrude their limbs when they lie in wait for food; or draw their nouriſhment through the aperture. When a branch of coralline is immerſed in vinegar the calcareous cruſt diſſolves, and leaves the cartilaginous parts uninjured, and by that means enables us to examine its internal tubular ſtructure. In point of colour the corallines differ very conſiderably, not only in different, but alſo in the ſame ſpecies, and without exception the whole become white on expoſure to air.

The coralline tribe, poſſeſſing much elegance and beauty, are highly ornamental in a collection of natural hiſtory; one ſpecies only appears to be appropriated to an uſeful purpoſe, which is the corallina officinalis, vaſt quantities of which are gathered and employed in medicine as an abſorbent.

Among the older writers the word coralline had a very general acceptation, and ſeems to have comprehended every deſcription of polype-bearing ſubſtances, in addition to the coralline genus of modern naturaliſts, ſuch as the *tubipora, ſertularia, cellepora, fluſtra, alcyonium, ſpongia*, &c. Mr. Ellis, in his publications on corallines, adheres rather too cloſely to this idea, but ſtill defines the ſeveral genera with ſo much accuracy as to render his works of the greateſt value to future naturaliſts. His veſiculated, tubular, celliferous, and articulated corallines are referable to the different genera above-mentioned (which ſee reſpectively). He includes alſo among his corallines the iſis, gorgonia, antipathes, &c. in which he is certainly wrong. The ſpecies of the true corallina at preſent known are as follow.

Species.

TRIDENS. Trichotomous, with compreſſed three-lobed flat joints. Ellis.

Found on the coaſt of the North American iſlands, where it was firſt diſcovered by Mr. John Greg.

OPUNTIA. Trichotomous, with kidney-ſhaped joints waved at the edges. Gmel. Indian fig coralline, Ellis. *Corallina latifolia*, Plunk. *Muſcus*, &c. Bocc. *Fucus*, &c. C. Bauh. *Scutellaria, opuntia marina*, J. Bauh. *Sertolaria*, Imper.

This kind grows on the coaſt of Jamaica, and other Weſt India iſlands, and is found alſo in the Mediterranean ſea. The colour is white, and the joints ſomewhat kidney-ſhaped.

MONILE. Trichotomous, with the lower joints compreſſed, convex, cuneated, oblong, and with the upper ones ſub-cylindrical. Soland. and Ellis. Necklace coralline.

Inhabits the ſhores of Jamaica.

INCRASSATA. Trichotomous, with compreſſed plano-convex wedge-ſhaped joints. Soland. and Ellis. Fleſhy coralline.

This kind is very frequently caſt up on the ſhores of the American iſlands, particularly Jamaica.

TUNA. Trichotomous, with compreſſed flat roundiſh joints. Soland. and Ellis. *Tuna coralline. Opuntia marina.* Park. Theat.

Found in the Mediterranean ſea.

NODULARIA. Trichotomous, and very much branched, with thick wedge-ſhaped joints, thoſe at the diviſions broadeſt, the terminal ones tricuſpidate or ovate. Pallas. *Nodularia alba*, Imp. *Muſcus coralloides*, C. Bauh.

Inhabits the ſame ſea as the preceding. Grows to the height of eighteen inches, and is very thick, ſtrong and white.

SQUAMATA. Trichotomous, the joints of the ſtem roundly compreſſed and wedge-ſhaped, thoſe of the branches flatly compreſſed; terminal ones flattiſh and ſharply two-edged. Ellis.

Inhabits European coaſts, and is of a ſea-green colour.

LORICATA. Trichotomous, with compreſſed, ſub-convex, wedge-ſhaped joints, angulated at the ſides; the terminal ones with ſmall obtuſe lobes. Ellis.

A native of the Mediterranean ſea.

PALMATA. Trichotomous, with compreſſed, ſub-convex, wedge-ſhaped joints, ſlightly denticulated at the tip; the extreme joints broad, and often furniſhed with ſhort finger-like lobes. Ellis.

This was found in the American ſeas, and is of a gloſſy white colour.

ELONGATA. Trichotomous, with the joints of the ſtem roundiſh and cuneated; thoſe of the branches cylindrical; the extreme joints a little obtuſe, and ſome of them capitated. Ellis.

Varies in colour from red to purple. It inhabits the European coaſts.

SUBULATA. Trichotomous, with the joints of the ſtem cuneated and two-edged, and projecting ſmall pointed branches from the top of each of their ſides, with round joints. Ellis.

The appearance of this coralline is very flat, white, ſlender, and ſmall, and ſeems as if it were very cloſely pennated or beſet with fine white fibres, projecting out on each ſide like the plume of a feather. This is the moſt delicate of the coralline tribe. Found in the Weſt Indies.

GRANIFERA. Trichotomous, with the joints of the ſtem compreſſed and wedge-ſhaped; thoſe of the branches roundiſh, and furniſhed with oppoſite ovate ovaries, ſeated on ſmall pedicles. Ellis.

This differs from all the other kinds of trichotomous corallines, in having proliferous ovaries, or branches growing out of them, being other ovaries. It is of a fine ſlender texture, and of a ſea-green colour. It was found on the coaſt of Africa, in the Mediterranean ſea.

OFFICINALIS. Sub-bipinnate, and uſually trichotomous, with the joints of the ſtem ſomewhat cuneated or turbinated; thoſe of the branches round, and ſome of the terminal ones capitated. Ellis. *Corallina officinalis, ſub-bipinnata, articulis ſulturbinatis,* Linn. Fn. Suec. *Corallina altera,* Tobernaem herb. *Muſcus corallinus filicinus,* Barrel.

Common on almoſt every ſhore, where it grows on the rocks in tufts of two, three, or four inches in length, and varying conſiderably in colour, being red, yellow, green, and white. This is the coralline of the ſhops, and is the kind uſed in powder as an abſorbent.

PINNATA. With pinnated branches without joints, and covered with a mealy ſubſtance. Ellis.

Found on the coaſt of the Bahama iſlands.

RUBENS. Dichotomous, filiform, with the joints of the ſtem round; thoſe ſupporting the diviſions clavated, and ſome of the lower ones bicornuted. Ellis. *Corallina rubens,* Linn. *Corallina filiformis dichotoma faſtigiata, articulis omnibus cylindricis,* Pallas.

Inhabits European ſeas; length two inches; colour red.

CRISTATA. Dichotomous, filiform, in creſted cluſters, with roundiſh joints; thoſe ſupporting the laſt ſub-diviſions clavated. Pallas.

This kind inhabits the European and American ſeas. The colour, as in officinalis, varies from red to purple, green, yellow, and white.

FRAGILISSIMA. Dichotomous, with ſmooth, even, cylindrical joints; thoſe at the extremity broadeſt at the tip. Linn. *Corallina minimum capillaceum,* Sloane.

This is found in the Weſt Indian and Mediterranean ſeas, and is ſo extremely fragile, that perfect ſpecimens are very rarely obtained; the colour is milk-white; length about two inches.

SPERMOPHOROS. Dichotomous, filiform, with roundiſh branches; thoſe ſupportingthe two laſt ſub-diviſions clavate. Linn., &c.

Inhabits European ſeas, is of a milk-white colour, and about an inch in length.

CORNICULATA. Dichotomous, with the joints of the ſtem and branches bicornuted; thoſe of the ſubdiviſions roundiſh. Linn.

Inhabits the ſame ſeas as the preceding.

FRUTICULOSA. Dichotomous, with round branches tapering towards the extremities, without joints, and mealy. Ellis and Soland.

There are many varieties of this ſhrub-like coralline; the ſpecies occurs on the coaſt of the Bahama iſles.

INDURATA. Dichotomous, with ſmooth round ſpreading branches, ſcarcely jointed. Ellis and Soland.

Found on the ſame ſhores as the preceding ſpecies.

LICHENOIDES. Dichotomous, with the branches a little rugged and not jointed, the tips dilated and flattened. Ellis. Liver-wort coralline.

This coralline is of a ſea-green colour; it inhabits the Bahama iſlands.

RUGOSA. Dichotomous, with cylindrical branches, hardly jointed, rough, with tranſverſe wrinkles, and compreſſed at the tips. Ellis and Soland. *Fucus Marinus,* &c. Sloane.

Found on the coaſt of Jamaica.

MARGINATA. Dichotomous, with ſcarcely jointed ſmooth flat branches, and raiſed margin. Ellis.

This kind occurred on the ſhore of one of the Bahama iſlands. Mr. Ellis obſerves, that though this coralline is found, when dry, on the ſhore, more flat than the reſt of this kind, it is very probable, when it is freſh taken out of the ſea, it is much rounder, the fibres in the inſide being extremely delicate, which occaſions its ſhrinking very much, when the gelatinous fluid is evaporated.

CYLINDRICA. Dichotomous, with cylindrical and nearly equal ſmooth joints. Ellis.

Mr. Ellis received this ſpecies of coralline preſerved in ſpirits, from the Weſt Indies, and obſerved by that means the internal parts appeared full of a clear gelatinous ſubſtance. Upon opening ſome of the joints, a number of minutely branched tubes were alſo diſcloſed, and hence this writer concludes, that the tubular-hollow appearance deſcribed by authors, proceeds from their having diſſected only dried ſpecimens.

OBTUSATA. Dichotomous, with oval-oblong joints, a little compreſſed and rounded at the ends. Ellis.

Inhabits the ſhores of the Bahama iſlands.

OBLONGATA. Dichotomous, with oblong cylindrical joints, a little compreſſed. Ellis

A ſpecies allied to the two foregoing corallines, and found on the ſhores of the ſame iſlands.

LAPIDESCENS. Dichotomous, with cylindrical downy branches. Ellis.

This kind is ſometimes found trichotomous, or three-branched, inſtead of two. In ſpecimens juſt received from the ſea, the ſurface appears covered with ſhort hair-like verticillate down, of a reddiſh colour, diſpoſed in regular circles, one above another.

BARBATA. Dichotomous, with ſhort cylindrical joints; thoſe at the extremity bearded at the tips. Linn.

Inhabits the ſhores of Jamaica, and meaſures about three inches in length. This is the bearded, or bead-coralline, of Ellis

ROSARIUM. Dichotomous, with round bead-like joints, thoſe of the ſtem longeſt and cylindrical. Ellis. Roſary coralline.

Nearly allied to the laſt, but ſpecifically different. A native of the Weſt Indies.

CUSPIDATA. Branches often dividing into four parts, and ending in ſharp points; joints cylindrical, and united by a glutinous tendinous ſubſtance. Ellis.

Found in the Weſt Indies; it is very brittle, white, and grows in tufts about three inches high.

TRIBULUS. Branches often dividing into five; joints two-edged, and united by a glutinous tendinous ſubſtance. Ellis.

A Weſt Indian ſpecies, of a whitiſh colour, and rather larger than the laſt.

FLABELLUM. Stem ſimple, incruſted, with the branches ſticking together, in a foliaceous fan-ſhaped manner, and ſomewhat waved. Ellis.

This coralline is alſo found in the Weſt Indies, and varies much in figure, being ſometimes of a flat kidney-ſhaped form, of about an inch in height, and ſometimes expanding to a large ſubdivided, lobed, and undulated maſs, from one to five inches broad, and as many in height. At the bottom of the ſtalk is a tuft of fine hair-like tubes. There are many kinds of this curious coralline found in the Weſt Indies, which vary in colour from a greeniſh-brown to a milk white.

CONGLUTINATA. Stem ſingle, ſlightly incruſted, with the branches dichotomous, and agglutinated together, and forming a naked fan-ſhaped leaf. Ellis.

Found on the coaſt of the Bahama iſlands; the colour ſea-green, and the height an inch and a half.

PHOENIX. Stem ſingle, incruſted, terminating in an oblong frond, compoſed of diſtinct faſciculated branches, produced on all ſides, the ſub-diviſions of which are united together, and appear quite flat. Ellis.

This is the palm coralline of Ellis, a ſingular ſpecies found on the coaſt of the Bahama iſlands; it is of a milk white colour, and about three inches and a half high.

PENCILLUS. Stem ſingle, incruſted, terminated by an orbicular tuft of dichotomous, filiform, jointed ramifications. Linn. Pencil coralline. Ellis.

This coralline varies in the thickneſs of its branches, as well as in ſize, being found from one to four inches long. In ſome the ſtem is very ſhort, in others four times the length of the head. The joints are eaſily diſtinguiſhed where the branches divide; the ſtem is compoſed of tubular filaments covered with calcareous cruſt; its general colour is white. This ſort of coralline adheres to ſhells by the baſe of its filaments, and is often found attached to ſuch bodies, in large cluſters, in the Weſt Indian ocean.

PENICULUM. Stem ſingle, incruſted, and terminated by an orbicular tuft of dichotomous, filiform, jointed ramifications. Ellis, &c. Mop coralline.

This is one of the moſt ſingular of the coralline genus, and differs from the reſt, among other particulars, in having the ſtem regularly wrinkled. The ſtem is ſmall at the baſe, and grows wider as it riſes, till it ſends forth its branches at the top; it adheres at the baſe like the ſertulariæ, by means of ramoſe tubes, which tubes do not leſſen as they extend or branch out, but have an equal diameter throughout their whole length. The ſpecies is found in cluſters in the American ſeas, particularly near the Bahama iſlands.

We muſt laſtly mention the corallina tereſtris of Linnæus, a ſpecies, according to that writer, diſtinguiſhed by having the branches placed oppoſite, and the joints cylindrical, with lateral peduncled, and tranſverſely wrinkled fructifications; it is further added, that the ſpecies is a few lines high, and inhabits heaths in Frieſland. Gmelin admits it as a ſpecies of coralline, with ſome doubt, and ſeems uncertain whether to conſider it of the animal or vegetable kingdom, and undoubtedly not without reaſon, for it has been deſcribed by different writers, both as a plant and a coralline. Meeſe defines it to be a vegetable of the cryptogamia claſs "Lichen fruticuloſus ramoſus articulatus, articulis longis cylindricis peltis pedunculatus." But Pallas, on the contrary, inſerts it in his work on Zoophytes, as a genuine coralline. "Corallina oppoſita ramoſa articulis cylindricis, fructificationibus lateribus pedunculatis tranſverſim oblongis." Between two ſuch oppoſite authorities, it muſt be acknowledged it might be improper to form any very concluſive opinion as to the real nature of the article in queſtion. Conſidering the ſituation in which it was ſaid to be diſcovered, we ſhould ſcarcely heſitate for a moment in concluding that it muſt belong to the vegetable kingdom, but then again the decided aſſertion of Pallas would militate againſt ſuch an opinion, and the teſtimony of ſuch an intelligent naturaliſt is not unworthy of regard. It is fortunate, however, that the accurate Ellis has afforded us much ſatisfactory information on this very ſubject: the matter is not ſo completely elucidated, perhaps, as we might wiſh; but his obſervations on the article are remarkable, and deſerve to be tranſcribed. "I ſhould have taken notice, (ſays this writer) of the corallina terreſtris mentioned by Linnæus, Syſt. Nat. 1306, from other authors; but as I found it a defective ſpecimen, of ſome one of the trichotomous corallines already deſcribed, I muſt refer the reader to a full account which I have given of it, in the Philoſophical Tranſactions, vol. lvii. p. 415, wherein the abſurdity of a *marine* animal ſubſtance, growing on a heath many miles from the ſea, is, I hope, fully demonſtrated." We are hence inclined to ſuppoſe, that in the courſe of correſpondence between Mr Ellis and Linnæus, the former had obtained an opportunity of examining ſome ſpecimen of the article in queſtion, or at leaſt of aſcertaining from Linnæus himſelf, what was really meant by his corallina terreſtris, and we ſhall therefore conclude, that it could not be of the ſhrubby lichen kind, as ſome imagine, but as Mr. Ellis ſtates it, a defective or mutilated ſpecimen of the coralline tribe, and in which caſe Linnæus and others muſt have been greatly deceived as to its *habitat*; the ſpecimen might, indeed, be found on a heath at any diſtance from the ſea; but, if truly a marine production, no one can be ridiculous enough to conceive it could grow there.

The ancients have ſaid great things of the virtues of the common *coralline*. Dioſcorides preſcribes it for mitigating the pain of the gout, and for preventing ſtagnations of the humours in any part; he ſays nothing of its virtues againſt worms, which are what we alone eſteem it for. They have been given in powder from ten grains to a ſcruple or half a dram twice a day in theſe caſes, and it has been ſaid with conſiderable good effect. Geoffroy, Mat. Med. vol. ii p. 238.

Although the corallium and coralline are reckoned alkaline and abſorbent, they are neglected in the preſent practice as unneceſſary.

CORALLINUM ARCANUM. See ARCANUM.

CORALLO-ACHATES, in the *Natural Hiſtory of the Ancients*, the name of a very beautiful ſpecies of agate, found at this time in the Eaſt Indies, but not in any plenty. It is very hard, and capable of a fine poliſh; and, when wrought, is an extremely elegant ſtone.

CORALLO-DENDRON, in *Botany*. See CORAL-*tree*.

CORALLO-FUNGUS, Vaill. See CLAVARIA.

CORALLOIDE MARBLE. See MARBLE.

CORALLOIDES, in *Botany*, Tournef. See CLAVARIA.

CORALLOIDES, Cord. See DENTARIA *enneaphylla* and *bulbifera*.

Coralloides, Dill. See Lichenes *Scyphiferi* and *Fruticuloſi*.

CORALLORHIZA, Gmel. Hall. Scop. See Ophrys *corallorhiza*.

CORALLUM, in *Mineralogy*, a name given by ſome of the writers on theſe ſubjects to the common Pyrites.

CORAM, Thomas, in *Biography*, a name worthy of ſome memorial, as the founder of a new ſpecies of charity, was born about the year 1688, and introduced at an early period to the buſineſs of the ſeas. Having ſpent ſome years in the ſervice, he ſettled in the eaſtern part of the metropolis, and was frequently witneſs to diſtreſſing ſcenes of children expoſed, through the indigence or cruelty of their parents, which excited him to project the foundling hoſpital; for which he obtained a charter in 1739. This charity has been of much real benefit to ſociety; but its regulations reſpecting the children ſeem to require reviſion, as it ſhould ſeem, by ſome late publications on the ſubject, that for a child to become an inmate there, the parent muſt be prevented for a long term of years from having the ſmalleſt intercourſe with her infant, for which ſhe muſt be ſuppoſed to have a tender affection, although unable to ſupport it. Mr. Coram was highly inſtrumental in procuring a bounty upon naval ſtores imported from the colonies, and in eſtabliſhing the colonies of Georgia and Nova Scotia. He died March 29, 1751, in his 84th year, and was buried in a vault under the chapel of the Foundling Hoſpital, where an inſcription perpetuates his memory; but his good deeds will live longer than inſcriptions on braſs or marble. Biog. Brit.

Coram, in *Geography*, a poſt-town of America, in Suffolk county, Long iſland, New York. It has about 60 houſes, and lies 62 miles eaſtward of New York city, and 10 from Smithtown.

Coram *non Judice*, in *Law*, is when a cauſe is brought into a court whereof the judges have no juriſdiction.

CORAMBIS, in *Ancient Geography*, a town of Ethiopia, near Egypt.

CORANCALI, a people of India, on this ſide of the Ganges. Ptolemy.

CORANI, a people of Italy, in the country of the Volſci. Pliny gave this name to the inhabitants of Cora; and ſays, that they derived their origin from Dardanus the Trojan.

CORANITÆ, a people of Arabia Felix. Pliny.

CORANTO, a *Dance*, *Courante*, *Fr. Corrente*, *Ital.* &c. It is ſtrange that the *courant* is ſaid by ſome writers to be the *moſt ſolemn* of all dance-tunes; forgetting the *ſaraband*, and that the word is derived from *currere*, to run. See Courant.

CORAS, John de, in *Biography*, a learned French lawyer, born at Realmont in 1513. He ſtudied law at Toulouſe with ſo much ſucceſs, that he gave public lectures upon it before he attained to manhood. He was afterwards elected profeſſor of the univerſity of Toulouſe, where he taught with ſo much celebrity that he is ſaid to have had 4000 auditors at one and the ſame time. He was appointed to the chancellorſhip under the queen of Navarre; and counſellor in parliament in the reign of Hen. II. He embraced the reformed religion, and lay under the ſuſpicion of being one of the authors of the conſpiracy in 1562, to deliver Toulouſe into the power of the Calviniſts. On this account it was with difficulty that his life was ſpared. For taking part with the prince of Conde, and other alleged offences, he was apprehended in 1572, impriſoned, and at length aſſaſſinated. The works of Coras, conſiſting of interpretations of the civil law, were printed at Lyons in 1556 and 1558, in two folio volumes, Moreri.

CORASAN, in *Geography*. See Korasan.

CORASIÆ insulæ, in *Ancient Geography*, a name given by Pliny to iſlands of the Ægean ſea.

CORASIUS Mons, a mountain of Aſia in Syria, near Antioch.

CORASPHI, or Coraxi, a people of Scythia, on this ſide of Imaus. Ptolemy.

CORAX, a mountain of Greece, in Etolia, between Naupacte and Callipolis, according to Livy, Ptolemy, and Strabo. It is now a mountain near Lepanto.—Alſo, a river of Aſiatic Sarmatia.—Alſo, mountains of Aſia, between Sarmatia and the Colchide territory, forming the boundary between the countries.—Alſo, a promontory of Tauric Cherſoneſus; E. N. E. of Criu-Metopon.—Alſo, a river of Aſia *(Carvaſiday)* which took its riſe in the mountains, ran from N. to S., traverſed the country of the Abari, and diſcharged itſelf into the Euxine ſea, E. of Pytium.

Corax, in *Ichthyology*, the Trigla *hirundo* of Gmelin.

Corax, in *Ornithology*, the *raven*, a ſpecies of Corvus.

CORAYA, the name given by Buffon to the Turdus *Coraya* of Gmelin, or *barred-tail thruſh* of Latham.

CORBACH, in Latin *Corbacum*, in *Geography*, a ſmall town of Germany, in the circle of the Upper Rhine, capital of the principality of Waldeck, which is now encloſed on all ſides by the kingdom of Weſtphalia, and likely to be conſidered only as a fief of the ſame.

The town is divided into the Old and New, each of which has its church. There is an excellent gymnaſium or grammar ſchool. One of the churches is adorned with a fine marble monument, erected by the republic of Holland to the memory of prince George Frederic of Waldeck, who was a field-marſhal in the Dutch ſervice. Corbach is ſituated in N. lat. 51° 17′, forty miles ſouth of Paderborn.

CORBAN, a Scripture term, ſignifying an oblation, or offering, to God on the altar.

Corban alſo denotes a ceremony in uſe among the Mahometans, yearly performed at the foot of mount Ararat in Arabia, near Mecca. It conſiſts in ſlaying a great number of ſheep, and diſtributing them among the poor.

This feſtival occurs ſeventy days after that of Beiram, and like the latter, continues three days; and theſe two are the only feſtivals which the Mahometans of the Eaſt obſerve with great ceremony; ſo that the people do not labour during theſe three days. The Moors keep each of theſe feſtivals eight days; and the emperor of Morocco holds this feſtival out of the city, that more people may aſſemble, and he thus preſerves the cuſtom which ſubſiſts among the Moors, of praying in the open fields, before they were converted to Mahometaniſm. He leads a ſlain ſheep to his palace by a horſeman, and, if the heart palpitates when it arrives there, this is interpreted to be a good omen.

CORBASA, in *Ancient Geography*, a town of Aſia, in Carbalia, a country of Pamphylia.

CORBEIAN *MS.* in *Biblical Hiſtory*, *Codex Corbienſis*, a MS. of the New Teſtament; of which there are two; one publiſhed by Blanchini, and the other by Sabatier. Theſe two MSS. were noted 1. 2. by Grieſbach, in his preface, p. 23, 24.

CORBEAU, *Raven* or *crow*, a moveable bridge, that received at the diſtance of ſix feet, from one end of it, a round pillar of wood about 12 feet high, and three palms in diameter, fixed or erected on the prow of a veſſel with a pully at the top of it. This moveable bridge or ſtage was about 18 feet long, and 4 feet broad, and was made ſomewhat in the form of a ladder of ſtrong timbers, laid cloſe acroſs, and cramped together with iron. On each ſide lengthways of this bridge or ſtage, there was a parapet, which reached juſt above a ſoldier's knee. At the fartheſt end of this ſtage or ladder, there was a bar of iron in ſhape ſomewhat like a peſtle, but ſharpened at the bottom, or brought to a point at the lower end. And connected with the top or upper end of it, there was a ring. To the ring there was fixed a rope, by means of which, with the help of the pulley at the top of the pillar, the machine was hoiſted up, and as an enemy's veſſel approached let fall on it, ſometimes on the prow, and ſometimes on either ſide, as an opportunity preſented itſelf. The fartheſt end of the machine falling with great force, ſtruck into the deck of the enemy's veſſel, and held it faſt. In this ſituation, if the two veſſels happened to be ſide by ſide, the Romans, who firſt made uſe of ſuch means in the ſea-fight between them, commanded by Duilius, and the Carthaginians, leaped on board the enemy's veſſel from every part of the ſide of their own at once. But if the veſſels were joined only by the prows, they then went two and two abreaſt along the machine, the two foremoſt extending their ſhields or bucklers right before them to ward off the ſtrokes or blows that were aimed at them in front, whilſt thoſe that followed, reſted each of them, the boſs of his buckler upon the top of the parapet on either ſide, and thus covered both their flanks. Such were the machines employed on that occaſion by the Romans, to which they gave the name of *Corvi*, or *Corbeaux*.

Some French writers give the name of Corbeaux to the machines with long beaks extending beyond the battlements and iron-hands ſuſpended to them by chains, with which Archimedes, at the ſiege of Syracuſe, under Marcellus, raiſed the Roman veſſels erect out of the water, and then, by looſening the chains from the beaks, let them fall into the water ſometimes on one ſide, and ſometimes bottom uppermoſt. But it is evident from Polybius's account of thoſe machines, that they were quite different from the *corvi* of the Romans, which we have juſt given a deſcription of. The *corvus* was alſo very different from what theſe writers call the *corbeau a laes-courans*, the *corbeau a griffes*, the *corbeau demoliſſeur*, the *corbeau à tenailles*, and the *corbeau à faux*.

CORBEIL, in *Natural Hiſtory*, the name of a curious ſpecies of *Chama*. It is of the larger kind, and is deeply ſtriated, both longitudinally and tranſverſely; ſo that it has a ſort of reticulated ſurface, like baſket-work.

Corbeil, in Latin *Corbolium*, in *Geography*, a town of France, in the department of Seine and Oiſe, ſituated at the confluence of the rivers Seine and Juine or Eſſonne, which divides it into the Old and New Town, in N. lat. 48° 38′, twenty-four miles ſouth of Paris. It is the chief place of a diſtrict, and has a ſub-prefect and a court of juſtice. The inhabitants excel in calico-printing and the manufacturing of glue; they have alſo very good tan-yards. Between Eſſonne and Corbeil is a larger powder-mill. The diſtrict has beſides ſeveral manufactures of cotton and linen, a ſugar-houſe, a paper-mill; and in the village of Moulin Galons there is a conſiderable manufactory of large copper coppers, kettles, and all ſorts of tinned copper kitchen utenſils. The population of Corbeil itſelf is 3200; that of the canton, which contains 26 communes upon a territorial extent of 225 kiliometres, is 14,807. The diſtrict compriſes four cantons, containing together 56,567 inhabitants upon 697 kiliometres and a half. Corbeil was formerly a county.

CORBEILLES, *Fr.* Baſkets about eighteen inches high, eighteen inches wide at top, and only about nine or ten inches wide at bottom, in order to furniſh loop-holes or openings for men ſtanding behind the parapet or work, they are placed on, to fire through without being ſeen by the enemy. They may be uſed either by the beſieged, or the beſiegers, on the parapet of the body of a place, or of any of its out-works, and on all kinds of retrenchments, whether they be lines of circumvallation or countervallation, of approach or counter-approach, &c.

Corbeilles, in *Geography*, a town of France, in the department of the Loiret, and diſtrict of Montargis; eight miles N. W. of Montargis.

CORBEL, in *Architecture*, the repreſentation of a baſket, ſometimes ſeen on the heads of caryatides.

The word is alſo uſed for the vaſe, or tambour, of the Corinthian column; ſo called from its reſemblance to a baſket, or becauſe it was firſt formed on the model of a baſket.

Corbel, or *Corbil*, is alſo uſed, in *Building*, for a ſhort piece of timber placed in a wall, with its end ſticking out ſix or eight inches, as occaſion ſerves, in manner of a ſhouldering-piece. The under-part of the end, thus ſticking out, is ſometimes cut into the form of a boultin; ſometimes of an ogee, and ſometimes of a face, &c. according to the workman's fancy; the upper-ſide being plain and flat.

Theſe corbels are uſually placed for ſtrength immediately under the ſemi-girders of a platform, and ſometimes under the ends of chamber-beams: in which latter caſe they are commonly placed a foot or two below the beam, and have a piece of timber ſtanding upright cloſe to the wall from the corbel to the beam.

Corbel is alſo uſed by ſome architects for a niche, or hollow, left in walls for images, figures, or ſtatues to ſtand in.

CORBELIN, in *Geography*, a town of France, in the department of the Iſere, and diſtrict of La Tour-du-Pin; 30 miles E.S.E. of Lyons.

CORBENY, or St. Marcoul, a ſmall town of France, in the department of the Aiſne, with a priory of Benedictines, where the kings of France uſed to pray for nine days, after having been anointed at Rheims.

CORBERA, a town of Spain, in the province of Valencia; 20 miles S. of Valencia.

CORBETT, in *Architecture*, is uſed by ſome, as Harris, in his Lexicon, for corbel.

CORBEUNTOS, in *Ancient Geography*, a town of Aſia, in Galatia, aſſigned by Ptolemy to the Tectoſages.

CORBIA, a town of the iſland of Sardinia, ſituated 25 miles from Bos, according to the Itinerary of Antonine.

CORBIANA, or Corbiena, a province of Aſia, between Hyrcania and Bactriana, according to Strabo, who ſays that it was in the country of the Elymæani.

CORBIE, in Latin *Corbeia*, a ſmall town of France, in the department of the Somme, on the Somme, in N. lat. 49° 54′ 32″, one hundred miles north of Paris; it is the chief place and canton in the diſtrict of Amiens, and has 1913 inhabitants. The whole canton contains 14,626 inhabitants diſperſed in 24 communes upon an extent of 172 kiliometres and a half.

CORBIENA, in *Ancient Geography*, (*Khorrem abad*) a place of Aſia, on the banks of the Gyndes, S.S.W. of Ecbatana and N.N.W. of Suſa.

CORBIERES, in *Geography*, a town of Swiſſerland, and chief place of a bailiwick, in the canton of Friburg; 10 miles ſouth of Friburg.

Corbieres, a valley of France near the Pyrenées, celebrated on account of a victory which Charles Martel obtained over the Saracens.

CORBIGNY, or St. Leonard, in Latin *Corbiniacum*, a ſmall town of France, in the department of the Nievre, chief place of a canton in the diſtrict of Clamecy, has 2315, and the whole canton 11,221 inhabitants. The territorial extent of the latter is 307 kiliometres and a half. It is compoſed of 15 communes.

CORBILO, in *Ancient Geography*, (*Cotton*) a port of Gaul, upon the Loire. M. D'Anville places it at a little diſtance from Condivicnum or Nantes to the weſt.

CORBIO, a town of Spain belonging to the Sueſſitani.—Alſo, a town of Latium, whoſe ſituation is unknown.

CORBIVEAU, from *Corbeau*, a raven, in *Ornithology*, an African bird, deſcribed by M. F. le Vaillant, in his "Hiſtoire Naturelle des Oiſeaux d'Afrique, &c." This bird is ſimilar to the raven in the ſhape of his body, his feet, and his claws; his middle claw is united as far as the firſt articulation, by a membrane. to the inner one; and the feathers on the lower part of his beak are turned upwards, and cover his noſtrils; but he is unlike the raven in his back, in the length of his wings, and in his graduated (*etagé*) tail. He appears, ſays the writer, to occupy in part the interval between the genus of the ravens and that of the vultures; though he reſembles the former in a greater degree than the latter. He is ſimilar to the African vulture in the ſize of his wings, which when ſpread are three inches longer than his tail; in his *graduated* tail, in the form of his beak, which is compreſſed ſide-ways, convex above, crooked and rounded. Theſe particulars diſtinguiſh the corbiveau from all the ſpecies of ravens hitherto deſcribed; and this bird may be always aſcertained by the white patch on the nape of his neck, which ſtrongly contraſts with the gloſſy black that conſtitutes the reſt of his plumage; except a white mark which ſeparates the ſides of this white patch on the back of his neck, and encircles the neck. This bird has ſome reſemblance, in point of form, to birds of prey; and his manners and mode of life confirm the reſemblance. Carrion conſtitutes the chief part of his food; and theſe birds frequently aſſemble in large and noiſy crowds. The appetite for fleſh and blood leads him to kill lambs and young antelopes, and to purſue even the largeſt quadrupeds. He flies with great ſtrength, and raiſes himſelf to a great height by his long wings. He conſtructs his neſt, in October, amidſt the trees; and lays four eggs greeniſh, ſpotted with brown. The corbiveau is not a bird of paſſage, but continues the whole year in the country where he was born. The female is leſs than the male, and the black leſs gloſſy.

CORBRENÆ, in *Ancient Geography*, a people of Aſia, placed by Polybius in the vallies of Media, with the Coſſæans and other barbarous nations.

CORBRIDGE, in *Geography*, a place of England in Northumberland formerly a borough, which ſent members to parliament. In 1296 it was burned by the Scots, and in 1311 ſuffered ſeverely from the ſame invaders; 4 miles eaſt of Hexham.

CORBULO, Cn. Domitius, in *Biography*, a diſtinguiſhed commander under ſome of the Roman emperors. By Tiberius he was made ſuperintendant of the highways in Italy. His conduct in this ſituation was queſtioned by ſucceeding ſovereigns. In the year 47, he engaged in military ſervice, and had the command of an army in Lower Germany, among whom he maintained, though at the expence of his humanity, the moſt exact diſcipline. In this commiſſion he was eminently ſucceſsful over the enemies of the empire. By Nero, in 54, he was ſent into Armenia, which was invaded by the Parthians. He employed all his efforts in reſtoring the diſcipline of the legions which had been enervated by the luxury of Syria. A maxim by which his conduct was governed, was, "that an enemy might be conquered with a pick-axe," referring to the labours of entrenchment and fortification, for which the Roman armies were ſo much diſtinguiſhed. No ſeverity, either of ſeaſon or climate, prevented him from keeping his troops in the field; and in ſuffering, as well as in exertion, he was an example to his men, going conſtantly in their clothing, and with his head bare. He never pardoned a deſerter who was apprehended. His various ſucceſſes were important to the government under which he was employed, and will be related under the article Rome. After he had forced the Parthians to an accommodation, he became, on account of the glory attached to his military reputation, an object of ſuſpicion and jealouſy with Nero, who reſolved upon his death. He accordingly ſummoned him to his preſence by a letter filled with the moſt flattering expreſſions of regard. The brave ſoldier ſcorned to ſuſpect the integrity and honour of his infamous ſovereign. He prepared to attend the court, but no ſooner had he reached the port of Corinth, than he met an order to die. Reflecting for a moment upon his own want of prudence and foreſight, he exclaimed, "I have merited my fate by truſting to the profeſſions of the monſter," and inſtantly plunged his ſword through his body. This was in the year 67. He left behind him memoirs of the ſeveral wars in which he had been engaged.

CORBUT, Charles and Philip, two draftſmen and mezzotinto ſcrapers of London, by whom we have ſeveral portraits from different maſters, as well as other prints from Vandyke, Ramſey, Titian, Oſtade, Renolds, Wilſon, &c. Charles Corbut, who was the elder, flouriſhed about the year 1760. Heinecken. Strutt.

CORCANG, or Aljorjaniyah, in *Geography*, a town of Aſia, on the river Gihon.

CORCAS, or Grand-Corcas, an iſland almoſt in the form of a creſcent, N. of St. Domingo, in the windward paſſage, about ſeven leagues W. of Turk's iſland, and about twenty E. of Little Inagua, or Heneagua. N. lat. 21° 55′. W. long. 70° 55′.

CORCELET, in *Natural Hiſtory*, that part of the fly claſs which is analogous in its ſituation to the breaſt in other animals. Many have called it the breaſt in theſe alſo, but improperly; becauſe the breaſt of other animals is the place of the lungs and trachea; but theſe organs are in the fly claſs diſtributed through the whole body. The wings are affixed to this part of the fly claſs; and there are ſome diſtinctions of great conſequence, in regard to the arrangement and diſtribution of thoſe animals into genera. Reaumur's Hiſt. Inſect. tom. iv. p. 126.

CORCELLE, in *Geography*, a river of France, which runs into the Arroux near Autun.

CORCHORUS, in *Botany*, a name given by the ancients to one or more of their moſt common pot-herbs. Linn. gen. 675. Schreb. 917. Willd. 1052. Tourn. Cl. 6. gen. 9. Gært. 391. Juſſ. 290. Vent. 3. 207. (Corete. Encyc.) Claſs and order, *polyandria monogynia*. Nat. Ord. *Columniferæ*, Linn. *Tiliaceæ*, Juſſ.

Gen. Ch. *Cal.* Perianth five-leaved; leaves linear-lanceolate, acute, erect, deciduous. *Cor.* Petals five, oblong, obtuſe, narrowed towards the baſe, erect, the length of the calyx. *Stam.* Filaments numerous, capillary, ſhorter than the corolla; anthers ſmall. *Piſt.* Germ ſuperior, furrowed; ſtyle thick, very ſhort; ſtyles ſimple or bifid. *Peric.* Capſule from two to ſix-celled, from two to ſix-valved. *Seeds* numerous, angular.

Eſſ. Ch. Corolla five-petalled. Calyx five-leaved, deciduous. Capſule from two to ſix-celled, from two to ſix-valved.

Sp. 1. C. *olitorius*. Briſtly-leaved corchorus, or common Jews' mallow. Linn. Sp. Pl. 2. Mart. 1. Lam. 1. Willd. 1. Comm. Hort. tab. 12. Lam. Ill. Pl. 478. fig. 1. Gært. tab. 64. fig. 2. (C. Plinii; Bauh. Pin. 317. Lob. ic. 505. Melochia; Alp. Egypt. 45. tab. 30.) "Capſules oblong, ventricoſe; loweſt ſerratures of the leaves briſtle-ſhaped." *Root* annual. *Stem* about two feet high, cylindrical, ſmooth, even-ſurfaced, a little branched. *Leaves* alternate, ſome ſpear-ſhaped, ſome oval, ſome almoſt heart-ſhaped, ſerrated, with a briſtle-ſhaped reflexed appendage on each ſide at the baſe, on long ſlender petioles; ſtipules ſimple, red at the baſe. *Flowers* ſmall, reddiſh-yellow; peduncles a line and half long; bractes three, awl-ſhaped. *Capſules* oblong, ſomewhat cylindrical or ſpindle-ſhaped, two inches long, obſoletely pentagonal, attenuated into a beak at the tip, five-celled, five-valved; cells divided by incompleat tranſverſe partitions. *Seeds* numerous, nearly pyramidal, dark brown, fixed in a double longitudinal row to the central margin of the partitions. A native of Aſia, Africa, and America; cultivated as a pot-herb in Egypt, Syria, and other parts of the Eaſt, particularly by the Jews. It is ſaid to poſſeſs ſome medicinal qualities, and to be uſeful as an emollient, a ſweetener, and a pectoral. 2. C. *trilocularis.* Linn. Mant. 177. Mart. 2. Lam. 2. Willd. 2, Jacq. Hort. 173. (C. æſtuans; Forſk. Deſc. 101.) "Capſules triquetrous, three-celled, three-valved; angles bifid, ſcabrous; leaves oblong; loweſt ſerratures briſtle-ſhaped." *Root* annual. *Stems* a foot high, erect, cylindrical, even-ſurfaced, green. *Leaves* alternate, petioled, undulate-ſerrated; ſtipules briſtle-ſhaped, ſmall. *Flowers* yellow; peduncles nearly oppoſite to the leaves, ſhort, two-flowered; calyxes angular; petals narrow. *Capſules* linear, triangularly priſm-ſhaped, channelled at each angle, ſcabrous, obtuſe and ſimple at the tip. A native of Arabia. 3. C. *tridens.* Linn. Mant. 565. Mart. 3. Lam. 3. (C. Americanus anguſto barbato folio; Pluk. Phyt. tab. 127. fig. 4.) β. trilocularis; Burm. ind. 123. tab. 37. fig. 2. "Capſules linear, nearly cylindrical, ſcabrous; loweſt ſerratures of the leaves briſtle-ſhaped." *Stem* even-ſurfaced, green. *Leaves* lanceolate, marked with lines, undulate-ſerrated. *Capſules* terminated by the three, much diverging, bifid ſtyles. La Marck received from Sonnerat an Eaſt Indian ſpecimen, which ſeems to be C. trilocularis of Burman, and to be ſomewhat different from Plukenet's plant. Its leaves are linear-lanceolate, toothed, on ſhort petioles; its capſules grow two or three together, on very ſhort peduncles, and are terminated by three diverging points, which do not appear bifid. 4. C. *æſtuans.* Linn. Sp. Pl. 3. Mart. 4. Lam. 4. Willd. 4. Gært. tab. 64. Lam. Ill. Pl. 478. fig. 2. Jacq. Hort. 1. tab. 85. (C. americana carpini folio, fructu longiore; Tourn. 259. Triumfetta ſubvilloſa; Brown. Jam. 232. tab. 25. fig. 1.) "Capſules oblong, three-celled, three-valved, ſix-furrowed, ſix-cuſpidate; leaves heart-ſhaped; loweſt ſerratures briſtle-ſhaped." *Root* perennial. *Stem* about a foot high, cylindrical, purpliſh, with divaricating branches. *Leaves* petioled, oval-heart-ſhaped or oblong, edged with ſharp teeth, the two loweſt ſometimes, but not always, extended into a long awl-ſhaped appendage. *Flowers* yellow, ſmall, lateral, two together, on ſhort petioles. *Capſules* terminated by three widely divaricated bifid beaks; valves marked on the inſide with obſolete tranſverſe wrinkles, inſtead of partitions; furniſhed with a double, crenulate, and ſomewhat undulated dorſal wing. A native of the Weſt Indies. 5. C. *acutangulus.* Lam. 5. Willd. 5. (Lyſimachia; Pluk. Phyt. tab. 44. fig. 1.) "Capſules priſmatic-wedge-ſhaped, acutely angular, three-toothed; leaves egg-ſhaped, ſometimes with a ſingle briſtle at the baſe; petioles hiſpid." *Root* perennial. *Stem* about a foot high, cylindrical, rather ſlender, hiſpid, branched. *Leaves* alternate, on long petioles; ſtipules five or ſix lines long, narrow, briſtle-ſhaped. *Flowers* yellow, ſmall, lateral, in pairs, on ſhort peduncles; petals oblong, rather narrow; bractes three, briſtle-ſhaped, often longer than the flower. *Capſules* ſcarcely an inch long, narrowed towards the baſe, pentangular, two of the angles more acute and more prominent than the others, terminated by three bifid beaks. A native of the Eaſt Indies. 6. C. *capſularis.* Linn. Sp. Pl. 4. Mart. 5. Lam. 6, Willd. 7. Gært. tab. 179. fig. 6. Lam. Ill. Pl. 478. fig. 3. (Alcea ſine corchorus; Pluk. alm. 18. tab. 255. fig. 4. Gænia ſativa; Rumph. amb. 5. 212. tab. 78. fig. 1.) "Capſules roundiſh, depreſſed, wrinkled; loweſt ſerratures of the leaves briſtle-ſhaped." *Root* annual. *Stem* five or ſix feet high, erect, cylindrical, ſmooth, branched. *Leaves* five or ſix inches long, petioled, oval-lanceolate, toothed, thin, pale green above, glaucous underneath. *Flowers* ſmall, lateral, ſingle; calyx-leaves concave, incurved, ſhorter than the corolla; petals emarginate. *Capſules* ſhort, ſtriated, wrinkled, five-celled, five-valved, (imperfectly ten-celled, ten-valved; five larger cells fertile; five ſmaller barren, placed between the others near the circumference of the capſule; Gært.) A native of China and the Eaſt Indies. A kind of hemp is obtained from the macerated ſtems, which is much uſed in China. 7. C. *faſcicularis.* Mart. 13. Lam. 7. Willd. 6. Vahl. ſymb. 3. p. 69. (Euphraſiæ affinis; Pluk. amalth. 85. tab. 439. fig. 6.) "Capſules conoid, woolly, faſcicled, nearly ſeſſile; leaves oblong-elliptical, petioled, without briſtle-ſhaped appendages at the baſe." Lam. *Root* perennial. *Stem* one or two feet high, ſlender, cylindrical, almoſt entirely ſmooth, a little branched. *Leaves* leſs than an inch long, alternate, toothed; petioles ſomewhat villous; ſtipules ſimple, narrow-lanceolate. *Flowers* yellowiſh, ſmall, almoſt ſeſſile, lateral, in faſcicles oppoſite to the leaves. *Capſules* five or ſix lines long, erect, three-valved, ſix-celled, furrowed. A native of the Eaſt Indies. 8. C. *hirſutus.* Linn. Sp. Pl. 6. Mart. 6. Lam. 8. Willd. 10. Jacq. Amer. 165. Hort. 3. 57. Piſt. 81. tab. 157. (Guazuma; Plum. gen. 36. Burm. amer. tab. 104.) "Capſules roundiſh, woolly; leaves egg-ſhaped, obtuſe, tomentous, equally ſerrated." Linn. "Leaves elliptical, tomentous, crenate; capſules ovate-oblong, downy, umbelled." Lam. A ſhrub three feet high, or more; branches alternate, cylindrical, cloathed with a whitiſh cottony down. *Leaves* alternate, petioled, near two inches long, and one broad. *Flowers* yellow; common peduncles oppoſite to the leaves, the length of the petioles, ſolitary, cottony, ſupporting five or ſix pedicelled flowers; calyx cottony on the outſide; petals ſcarcely the length of the calyx. *Capſules* a little incurved, very woolly, obtuſe, two-celled. A native of South America. 9. C. *tomentoſus.* Thunb. Fl. Jap. 228. "Capſules oblong, woolly; leaves tomentous." Thunb. *Stem* ſhrubby, cylindrical, erect, two feet high, and more; ſmooth, purple, branched; branches alternate; at the bottom purple and ſmooth; at the top tomentous, erect, wand-like; branchlets filiform, ſpreading, tomentous. *Leaves* alternate, petioled, nerved, ſpreading; petiole very ſhort, tomentous. *Flowers* orange-coloured, axillary and terminal, generally ſolitary. *Capſules* cylindrical, woolly. A native of Japan. La Marck aſſerts that it is diſtinct from the preceding. 10. C. *hirtus.* Linn. Sp. Pl. 5. Mart. 8. Lam. 9. Willd. 13. Jacq. Hort. 3. tab. 58. (C. folio ulmi major; Plum. Sp. 7. Burm. Amer. tab. 103. fig. 2.) "Capſules oblong, hairy; ſtem hairy; leaves oblong, equally ſerrated." *Root* annual. *Stem* about two feet high, cylindrical, rather ſlender, branched. *Leaves* alternate, unequal at the baſe, on ſhort hiſpid petioles; ſtipules narrow, very hiſpid. *Flowers* yellow; peduncles and calyxes hiſpid; petals oblong, ſhorter than the calyx, obtuſe, narrowed a little towards the baſe; ſtamens yellow, the length of the petals; germ oblong, columnar, hiſpid, with whitiſh hairs directed upwards; ſtyle filiform, the length of the ſtamens; ſtigmas two, not ſpreading. *Capſule* near an inch long, two-furrowed, two-valved. *Seeds* ſmall, black. A native of the Weſt Indies, and South America. 11. C. *ſiliquoſus.* Linn. Sp. Pl. 1. Mart. 9. Lam. 10. Willd. 14. Jacq. Hort. 3. tab. 59. (C. folio ulmi minor; Plum. Sp. 7. Burm. Amer. tab. 103. fig. 1. Corchoro affinis; Sloan. Jam. 50. hiſt. 1. 145. tab. 94. fig. 1. Coreta foliis minoribus; Brown. Jam. 147.) "Capſules linear, compreſſed, two-valved; leaves lanceolate, equally ſerrated." *Root* perennial. *Stem* about two feet high, almoſt woody, erect, ſlender, cylindrical, panicled, ſomewhat pubeſcent. *Leaves* ſmaller than thoſe of the preceding ſpecies, without awl-ſhaped appendages at the baſe, on rather long petioles, which are pubeſcent on one ſide. *Flowers* yellow, lateral, peduncled, ſolitary or in pairs; germs cloathed with ſhort hairs. *Capſules* nearly ſmooth, two-valved. According to Linnæus, the ſpring flowers are without petals, tetrandrous, with a four-leaved calyx; but thoſe produced in autumn, correſpond with the generic character. A native of the Weſt Indies. 12. C. *japonicus.* Mart. 7. Lam. 11. Willd. 11. Thunb. Fl. Jap. 227. (Teito, vulgo jamma buki; Kæmpf. amæn. 844.) "Capſules round, ſmooth; leaves doubly ſerrated." *Stem* ſhrubby, two feet high or more, ſmooth; branches alternate, filiform, angular. *Leaves* ſeveral together from alternate buds, petioled, almoſt heart-ſhaped, ovate-acuminate; ſerratures acute, almoſt briſtle-ſhaped, nerved, villous, and particularly ſo on the nerves underneath. *Flowers* yellow or orange-coloured, terminal, ſolitary, on ſhort peduncles. A native of Japan, where it is cultivated on account of its beauty. There is a variety with double flowers. 13. C. *tetragonus.* Mil. Mart. 10. (C. flore flavo fructu caryophylloide; Pluk.) "Capſules quadrangular, reflexed at the points; leaves ovate-heart-ſhaped, crenate." *Stem* about two feet high, with ſmall branches. *Flowers* pale yellow, very ſmall. *Capſules* ſwelling, rough, about an inch long, flattened at the top. A native of both Indies. 14. C. *linearis.* Mil. Mart. 11. "Capſules linear, compreſſed, two-valved; leaves lanceolate, ſerrate toothed." *Stem* three feet high, with weak branches. *Leaves* about three inches long, and one broad, ſitting cloſe to the branches. *Flowers* pale yellow, very ſmall, oppoſite to the leaves, ſolitary. *Capſules* two inches long, flat, two-celled. A native of New Spain, about Carthagena. 15. C. *bifurcatus.* Mil. Mart. 12. "Capſules linear, compreſſed, with two horns at the points; leaves heart-ſhaped, ſerrated." *Stem* between three and four feet high, herbaceous, ſtrong, with upright branches. *Leaves* on long ſlender petioles, and between them many ſmaller leaves, nearly of the ſame form, ſitting cloſe to the branches. *Flowers* pale yellow, very ſmall, lateral, on ſhort peduncles. *Capſules* near three inches long, flat, ending in two horns, two-celled. A native of Jamaica; raiſed from ſeeds ſent to Miller by Dr. Houſton. 16. C. *flexuoſus.* Mart. 14. Willd. 12. Thunb. in Linn. Tranſ. 2. 335. "Leaves doubly ſerrated, cuſpidate; ſtem zig-zag." *Stem* cylindrical, rendered ſomewhat angular by the decurrent leaves, two feet high, erect, ſmooth. *Leaves* two inches long, alternate, petioled, obliquely heart-ſhaped, villous, ſpreading. *Flowers* yellow, terminal. 17. C. *ſerratus.* Mart. 15. Willd. 9. Thunb. ibid. "Leaves oblong, ſerrated, cuſpidate; branches ſmooth." *Stem* erect, ſmooth, branched; branches cylindrical, purple, erect. *Leaves* two inches long, alternate, petioled, ſpreading; ſerratures large, briſtle-ſhaped at the tip, ſlightly rough with hairs above, ſmooth underneath. 18. C. *ſcandens.* Mart. 16. Willd. 8. Thunb. ibid. "Leaves egg-ſhaped, briſtly-ſerrated, oppoſite; ſtem and branches zig-zag, climbing." *Stem* cylindrical, branched; branches oppoſite, divaricated. *Leaves* oppoſite, on ſhort petioles, rounded at the baſe, acuminate, an inch long. *Flowers* yellow, terminal, ſolitary. The laſt three ſpecies are natives of Japan.

Propagation and Culture.—All the ſpecies may be raiſed from ſeeds ſown in the ſpring in a hot-bed, protected by a glaſs frame. Soon after they come up, they ſhould be tranſplanted into a freſh hot-bed; when they are grown ſtrong, they ſhould be removed into ſeparate pots; and if gradually enured to the open air, they may be ſhaken out of the pots in June, and ſet in an open border, where they will generally flower and ripen their ſeeds. C. hirſutus muſt be kept in a bark-bed in the ſtove during winter. Miller.

CORCIA, in *Geography*, a town of the iſland of Corſica; 14 miles N.N.W. of Corte.

CORCIEUX, a ſmall town of France, in the department of the Voſges, chief place of a canton, in the diſtrict of Saint Dié, with a population of 1143 individuals; that of the canton amounts to 8351, upon 177½ kiliometres; and the number of its communes is 13.

CORCOBA, in *Ancient Geography*, a town ſituated on the ſouth coaſt of the iſland of Taprobana, according to Ptolemy.

CORCOMA, a town of Africa, in Mauritania Cæſarienſis, between Carepula and Lagrutum. Ptolemy.

CORCONIANA Mansie, a place of Sicily, on the route from Catana to Agrigentum, according to the Itinerary of Antonine.

CORCORAS, a river of Pannonia, which, according to Strabo, paſſed before Naupontus, and diſcharged itſelf into the Savus.

CORCULUM, in *Vegetable Phyſiology*, is a term uſed by Linnæus, after Cæſalpinus, for the heart, or more properly embryo, of a ſeed; alluding to its ſhape, which, in the walnut, and many other ſeeds, reſembles the animal heart in miniature. It is the moſt important and even eſſential part of a perfect ſeed, to which all the reſt are ſubſervient, being the point whence the future plant originates. In unimpregnated ſeeds it is deficient, or rather abortive; in fertile ones it is cloſely connected with the cotyledons, on which it depends for the firſt ſupplies of nutriment, and other exciting cauſes of its evolution. The corculum conſiſts of two parts: the *roſtellum*, or radicle, which, by an unerring law of nature, deſcends in order to become the root; and the *plumula*, or feather, which as regularly aſcends, and becomes the ſtem and leaves. Dr. Darwin ingeniouſly accounts for this diverſity of direction in theſe two parts, from the former being ſtimulated by moiſture, the latter by air; and preſumes that each extends itſelf accordingly where its vitality is moſt excited. Other philoſophers have explained the ſame phenomenon, far leſs happily, on mechanical principles. See Cotyledon and Embryo. S.

CORCULUS, the *little heart*, in *Natural Hiſtory*, a name given by authors to a ſmall ſpecies of *cordiformis*, or *heart-ſhell*, of a roſe colour.

CORCURA, in *Ancient Geography*, a town of Aſia, in Aſſyria. Ptolemy.

CORCYRA, (*Corfu*,) one of the Greek iſlands, ſituated in the Ionian ſea, and called, in more ancient times, Drapane, Scheria, and Phæacia. It is ſaid to have taken its name from that of a nymph, whom Neptune raviſhed in this iſland. It is about 45 miles in length, 22 in breadth, and 210 in compaſs. It was famous for the delightful gardens of king Alcinous, who courteouſly entertained Ulyſſes after his ſhipwreck. The ſouthern parts of the iſland are barren, mountainous, and ill provided with water; but the northern coaſt is very fertile in all kinds of delicious fruit, excellent wines, olives, grain, &c.; whence Homer has denominated it the fruitful Scheria. It had anciently two cities of no ſmall note, *viz.* Corcyra and Caſſiope: the former was the metropolis of the iſland, and once very powerful, as appears from Thucydides, and others; the latter is commended by Pliny and Ptolemy as a wealthy and well-built city, but Cicero calls it only a haven.

This iſland is ſaid to have been firſt inhabited by the Phæaces, whence it was called Phæacia; but afterwards the Corinthians ſent hither a numerous colony, B.C. 756. The Corcyrians were, for ſome time, maſters of the ſea. Their government was firſt monarchical; but afterwards they formed themſelves into a republic, and made a very conſiderable figure in the flouriſhing times of Greece. Herodotus informs us (lib. vii. cap. 168.) that they were very powerful by land; but he much blames them for their deceitful conduct, with reſpect to the aſſiſtance they promiſed the Greeks againſt Xerxes: for, being invited by the Athenian and Lacedæmonian ambaſſadors to join them in the common cauſe, they readily engaged to ſend powerful ſuccours, aſſuring them that they would not neglect the ſafety of Greece in ſo imminent a danger; being well apprized, that if the enemy prevailed, they would ſoon be reduced to the condition of ſlaves. The ambaſſadors departed; and the Corcyrians, fitting out a ſquadron of 60 ſhips, ſailed to the coaſt of Peloponneſus, and having anchored about Pylos and Tenarus, waited in that ſtation to ſee the event of the war, being reſolved to join the victorious party. When they heard that the Perſians were defeated at Salamis, they left their ſtation, and joined the reſt of the Greeks, pretending that they had been prevented by the Eteſian winds from doubling the cape of Malæa, and being preſent at the battle. The Corcyrians ſubmitted to Alexander, and remained ſubject to the kings of Macedon, till they were delivered by the Romans, in the reign of Perſes; from which time they enjoyed their liberty, till the reign of Veſpaſian, when they underwent the common fate of the other Greek iſlands and ſtates both in Europe and Aſia. The Corcyrian ſeditions were proverbial even among the Greeks. See CORFU.

CORCYRA *Melæna*, or *Nigra*, ſo called to diſtinguiſh it from the former, an iſland in the Adriatic ſea, on the coaſt of Illyricum. The Cnidians built a town on this iſland. In the war of Illyricum, B. C. 229, the Romans, under the conſulſhip of L. Poſtumius Alberius II. and Cn. Fulvius Centimalus, landed in the iſland, and the Corcyrians delivered up the garriſon of the Illyrians, who had taken poſſeſſion of it under the command of Demetrius of Pharos; and the whole iſland ſubmitted, conceiving that this was the only method of ſecuring themſelves for ever from the inſults of the Illyrians. Upon the concluſion of peace, it was agreed, that Corcyra, as well as ſome other places, ſhould continue in the poſſeſſion of the Romans. This iſland is now called *Curſoli.*

CORCYRIS, a town of Egypt. Steph. Byz.

CORCZYCZ, in *Geography*, a town of Poland, in the palatinate of Volhynia; 46 miles N. of Conſtantinow.

CORCZYN, or KORTSCHIN, a town of Poland, in the palatinate of Sandomirz, on the Viſtula; 48 miles W.S.W. of Sandomirz.

CORD, or CHORD, an aſſemblage of ſeveral threads of hemp, cabled or twiſted together by means of a wheel.

The word comes from χορδὴ, which properly ſignifies an inteſtine, or gut, whereof cords may be made.

CORD *of St. Francis*, a kind of rope adorned with knots, worn by the brothers of the fraternity inſtituted in honour of that ſaint.

Some, as the Cordeliers, Capuchins, Minorites, and Recolets, wear it white; others, as the Pique-puces, black. Its deſign is to commemorate the bonds wherewith Jeſus Chriſt was bound.

CORD, *the ſociety of the*, includes a great number of people beſides religious. To obtain indulgences, they are only obliged to ſay five Paters, five Ave Maries and Gloria Patris, and to wear this rope, which muſt have been firſt bleſſed by the ſuperiors of the order.

CORD *of wood*, a certain quantity of wood for burning; ſo called, becauſe formerly meaſured with a cord.

It is now meaſured, particularly in Worceſterſhire, where the ſame has been regulated by ſtatute, between two ſtakes of wood, four feet high, and eight feet apart; and is to be four feet broad and high, and eight feet long = 128 cubic feet = 4.74 cubic yards = 3.622 ſteres or cubic inches of France = 445.223 cubic links.

CORD *wood* is properly new wood; and ſuch as, when brought by water, comes aboard a veſſel; in oppoſition to that which is floated. All burning wood, not exceeding eighteen inches circumference, is deemed cord-wood.

CORD, in *Geometry*, *Muſic*, &c. See CHORD, and STRING.

CORD, *Magical*, an inſtrument in great uſe among the Laplanders, and ſuppoſed to be of great virtues among them. It is a cord or rope, with three knots tied in it. They uſe many magical rites and ceremonies in the preparing and tying of this cord; and when thus prepared, it is ſuppoſed to have power over the winds; and they will ſell, by means of it, a good wind, or at leaſt a promiſe of one, to a ſhip. If they untie only one of theſe knots, a moderate gale is to ſucceed; if two, it is to be much ſtronger; and if three, there is to be a ſtorm.

CORD, *Umbilical.* See UMBILICALIS *funiculus.*

CORD-*Wood*, in *Rural Economy*, a term applied to the ſmall ſorts of broken-up or other wood, which was formerly ſold by the cord.

CORDA, in *Ancient Geography*, a town of Albion, in the country of the Selgovæ. As this place was ſituated farther to the N.W. than the other towns of the Selgovæ, it is thought to have ſtood on the banks of Loch-Cure, out of which the river Neith ſprings.

CORDAGE, is uſed, in *general*, for all ſorts of ropes and cords, great and ſmall; and more particularly for thoſe that are uſed in the rigging and fitting out of ſmall veſſels. The word is alſo uſed for the art of preparing and manufacturing the ropes, &c. See CABLE. See alſo ROPE, and RIGGING.

The naval cordage of different ages and nations has been formed of very different materials. Thoſe of the earlier ages were probably thongs of hide or leather; the uſe of which was retained by the Caledonians in the third century, and by the nations north of the Baltic in the ninth and tenth centuries. They are even now uſed as ropes in the weſtern iſles of Scotland. Theſe were ſuperſeded in the ſouthern parts of Britain, and on the continent, at an early period, by iron chains. Accordingly we find, that in the maritime and commercial country of the Veneti, who were intimately connected with the Belgæ of Britain, iron chains were uſed for cables in the days of Cæſar. However, in the more improved countries of the ſouth, thongs of leather and chains of iron had long given place to the uſe of vegetable threads; and the art of combining them into ſtrong cords was underſtood and practiſed. In this manner the Greeks uſed the common ruſhes of their country, and the Carthaginians applied to the ſame purpoſe the ſpartium or broom of Spain. And as all the cordage of the Romans was formed of theſe materials, at their laſt deſcent on our iſland, the art of manufacturing them would neceſſarily be introduced with the Roman ſettlements among the Britons. Under the direction of the Roman artiſts, their *junci*, or ruſhes, would be wrought into cordage. Accordingly the remains of old cables and ropes are ſtill diſtinguiſhed among the Britiſh ſailors, by the name of "old junk." Moreover, the Roman ſails, which, in the days of Agricola, were compoſed of flax, were afterwards made of hemp; and our own are therefore denominated *cannabis*, or "canvas," by our preſent mariners. About the ſame period, the ſame materials were ſubſtituted for the junk of the Britiſh cordage; for the uſe of hempen ropes upon land, and of hempen nets for hunting, was very common among the Romans in the firſt century. The Indians ſtill make their cordage of the bark of cocoas, and other trees, and of ſhreds of plants. The cordage of the Britiſh navy is made of the Riga or beſt Peterſburg break hemp, and tarred with good Stockholm or Ruſſia tar.

The cordage is ſaid to be *baked*, when, having paſſed a ſtove, or other hot place, it is drained of all its moiſture. *White* cordage is that not yet pitched. *Cordage pitched in the ſtove*, is that which is paſſed through hot pitch as it comes out of the ſtove. Each quintal of cordage may take up about twenty pounds of pitch. The cordage is ſometimes pitched in the thread. For the method of making ropes and different ſorts of cordage, ſee Rope-*making*.

By 25 Geo. III. c. 56. no perſon ſhall uſe, in the manufacture of any ropes for ſhipping, (or ſell the ſame,) hemp called ſheet chucking, half clean, whale line, or other topping, cordilla, damaged hemp, or any hemp from which the ſtaple part thereof ſhall have been taken away by the manufacturer, on pain of forfeiting, for the manufacturer, ſuch rope, and treble the value of it; and for the vender, not being the manufacturer, a ſum equal to treble its value. For the better diſtinguiſhing the quality of ſuch ropes, that which is inferior to clean Peterſburg hemp ſhall be deemed *inferior* cordage, and marked accordingly, by running from one end of it to the other three-tarred mark yarns, ſpun with turn contrary to that of rope yarn, and alſo one like tarred yarn in every other rope for the uſe of ſhipping; and the maker ſhall mark or write, on a tally to be affixed on it, the word "ſtaple," or "inferior," (as the caſe ſhall be,) and alſo his name, ſigned by himſelf or his attorney, together with the name of the place where manufactured; and in default thereof, ſhall forfeit 10*s*. for every hundred-weight. And if any ſuch rope-maker ſhall wilfully or knowingly permit his name to be put to any ſuch ropes, not being of his own manufacture; or if the vender or proprietor, or any other perſon, mark upon the tally the name of any perſon, not being the manufacturer, he ſhall forfeit 20*l*. And if any perſon ſhall make any cables of any old or worn ſtuff, which ſhall contain above 7 inches in compaſs, he ſhall forfeit four times its value. Foreign-made cordage, for which no duties have been paid, belonging to a ſhip owned by any of his majeſty's ſubjects, reſident in Great Britain, or the Britiſh colonies, and entering any port in this kingdom, ſhall be duly entered on oath at the cuſtom-houſe (ſtanding and running rigging excepted); and before the ſhip be cleared inwards, the maſter ſhall pay the duties, on pain of forfeiting the cordage, and 20*s*. for every *cwt*. of it. Upon the importation of cordage, tarred or untarred, there is a duty payable of 8*s*. 6*d*. *per cwt*, and no drawback allowed upon exportation; and in the port of London there is a farther ſcavage-rate of 1*d*. *per cwt*. of 112 *lbs*. upon the importation of cable-ropes for cordage.

As to the ſtrength of ropes, or cordage, M. Reaumur takes occaſion, in the Memoirs of the Royal Academy, to conſider the queſtion, whether a rope compoſed of ſeveral twiſts, or ſtrands, interwoven, *v. gr.* ten, have more ſtrength to ſuſtain a weight, than the ten twiſts would have ſeparately, placed parallel over one another; or, which is the ſame thing, whether, if each twiſt be capable of ſuſtaining the weight of a pound, the whole cord be able to ſuſtain more than ten?

On the one hand, 1. By virtue of the twiſting, the diameter of the rope is made larger than are thoſe of the ten twiſts together; but it is apparently by its thickneſs that a rope ſuſtains a weight, or reſiſts a fracture. 2. Twiſted ſtrands have not all, as when parallel, a vertical direction with regard to the weight: ſeveral of them, and even the greateſt part, have oblique directions, and of conſequence do not bear all the ſhare of the burden they would otherwiſe bear. In effect, they are inclined planes that are only preſſed with a part of the load.

Hence it would follow, that the ſurplus of the ſtrength of the twiſts might be employed in raiſing a larger weight.

On the other hand, it is true, that, in twiſting the ſtrands, ſome are ſtretched, and others left more looſe; and the new tenſion given the former, ſerves to weaken them, and has of itſelf the effect of a weight: thus they become leſs able to ſuſtain one ſo large. Thoſe more lax, on the contrary, evade, in ſome meaſure, the action of weight: for the action is diſtributed equally on the ten ſuppoſed equal twiſts; and if ſome, by reaſon of their particular diſpoſition, receive leſs than their quota, the weight will act more forcibly on the reſt, and will break them firſt, as being more tenſe; after which, it will eaſily diſpatch the reſt, as not being in ſufficient number to oppoſe it.

This is the ſum of what can be urged for and againſt the twiſting: to decide between them, M. Reaumur had recourſe to experiment. The reſult was, that, contrary to all expectation, he ſtill found the twiſting diminiſhed the ſtrength of the rope: whence it is eaſily inferred, that it diminiſhes it the more, as the rope is the thicker. For inaſmuch as the twiſting diminiſhes; the more twiſting, the more diminution.

The reſiſtance or friction of cordage is very conſiderable; and by all means to be conſidered in calculating the power of machines. M. Amontons obſerves, in the Memoirs of the Royal Academy, that a rope is ſo much the more difficult to bend, 1. As it is ſtiffer, and more ſtretched by the weight it draws. 2. As it is thicker; and, 3. As it is to be more bent; *i. e.* as it is to be coiled, for inſtance, into a ſmaller ring.

The ſame author has thought of ways to prove, in what proportion theſe different reſiſtances increaſe: that ariſing from the ſtiffneſs or rigidity occaſioned by the weight which draws the rope, increaſes in proportion to the weight; and that ariſing from its thickneſs, in proportion to the diameter. Laſtly, That ariſing from the ſmallneſs of the gyres, or pulleys, about which it is to be wound, is indeed greater for ſmaller circumferences than large ones, but does not increaſe ſo much as in the proportion of thoſe circumferences.

On this footing, the loſs a machine ſuſtains by the cordage, being eſtimated in pounds, becomes, as it were, a new weight, to be added to that which the machine is to raiſe. This augmentation of weight will render the cords ſtill the more ſtiff; which exceſs is to be computed as before.

Thus we ſhall have ſeveral ſums ſtill decreaſing; which are to be added together, as in the article of friction; and it will be ſurpriſing to ſee what a ſum they will amount to. See Friction.

Where ropes are uſed in a machine, all the reſiſtance reſulting from their ſtiffneſs is to be put together; and all that occaſioned by the friction; which will make ſo conſiderable an augmentation to the difficulty of the motion, that a power which to raiſe a weight of 3000 pounds, by means of a fixed and moveable pulley, needed only 1500 pounds, muſt, according to M. Amontons, have 3942 pounds, on account of the frictions, and the reſiſtance of the cordage.

Cordage, *twice-laid*, is that which is made of caſt rigging, as ſhrouds, ſtays, mooring and other cables, which, if not much worn, will make good ropes for wetting the ſides of ſhips, worming and woolding for cables, ſpun-yarn for ſeizing, worming for large ſtays, ſeizing for ſtrops of blocks, ſmall cable-laid ropes for warping ſhips, rat-lines, ſcaffolding-ropes for dock-yards, &c. When the yarn of this old ſtuff is overhauled, a little thin tar ſhould be poured on it, which will make it pliable and lie better. The yarn unfit for knotting will pick into oakum for caulking.

CORDATED Leaf, in *Botany*. See Leaf.

CORDAX, in *Antiquity*, a gay ſort of dance.

CORDE, Maurice de la, in *Biography*, born at Rheims, where he attained conſiderable eminence for his claſſical and critical learning, was made doctor of the faculty of medicine, at Paris, in the year 1559. In the courſe of an harangue, before his brethren of the faculty, having cenſured with aſperity the manners of the Romiſh clergy, and ſome of their ceremonies, and ſpoken too favourably of the reformed religion, he was ſeized and thrown into priſon. This happened in the year 1569. An edict of pacification being obtained the following year, he was releaſed, and, with the reſt of the Huguenots, allowed openly to profeſs his religion. He was alſo permitted to practiſe medicine; but the College, who were firm in the Catholic religion, took from him the place of reader or lecturer. De la Corde was one of the few Huguenots who eſcaped the maſſacre, which took place on the eve of St. Bartholomew, in the year 1572; and in 1574, he obtained an order from parliament, reinſtating him in his rights in the faculty of medicine. He publiſhed, in 1574, "Hippocratis Libellus de iis quæ Virginibus accidunt," with Commentaries, 8vo. Pariſiis; and in 1584, "Hippocratis de morbis Mulierum, Interpretatio," folio. Haller Bib. Med. Eloy Dict. Hiſt.

Corde *a feu*, *Fr.* cord-match, or match of cord, fit for retaining a ſmall quantity of fire for a long time, and of furniſhing it, or being lighted up, when wanted.

CORDEAU, *Fr.* a cord made uſe of for meaſuring ground. That which engineers commonly made uſe of was divided into toiſes, feet, and inches, in order to have the exact openings or magnitudes of angles, and the lengths of lines, which they wiſhed to trace or meaſure. But as cords ſhrink in moiſt or wet weather, and lengthen in dry, this inequality of extenſion rendered the meaſures of the diviſions untrue, and not to be depended on. To guard againſt ſuch errors or miſtakes, a chain of iron-wire, not ſo liable to undergo alterations with thoſe of the weather, was introduced and made uſe of. The French ſay, *manier le cordeau, prendre le cordeau, travailler au cordeau.*

Cordeau *de campement, ou cordeau d'alignement pour le campement*, cord of the encampment, or cord of alignement for the encampment; a long line or cord, divided equally from diſtance to diſtance, and marked at the points of equal diviſions by pieces of cloth of a ſcarlet or other vivid colour, in order to be the better ſeen and perceived. It ſerves, in the firſt place, to mark and aligne, from the left wing to the right wing, the extent on the front line of the camp for each battalion, company by company; and on which line are the colours and ſtandards of the troops that occupy the camp. It then ſerves for laying or marking off, on one and the ſame right line, the bundles or bells of arms advanced in front of the aforeſaid line, about ten paces, or five toiſes, or thirty feet, and parallel thereto. The ſame operation is performed for the alignement or the tracing out of the rear of the camp. Then the tents are placed, which occupy each about three paces or nine feet, with an interval of three paces between every two of them. About ten paces, or 30 feet, from the rear of the camp is the line for the kitchens or cooking-places for the companies; and about ten paces behind them is the ground for the drums and ſuttlers. At about 20 paces from this ground are the tents of the ſubaltern officers; and from 10 paces to 20 paces behind them are thoſe of the majors and captains, and thoſe of the colonels and lieutenant-colonels.

CORDED Cross, in *Heraldry*. See Cross-*Corded*. This is a term uſed to expreſs the cordage of a bale; as for example, a bale argent, corded gules.

CORDELIER, a Franciſcan, or religious of the order of St. Francis.

The Cordeliers are clothed in thick grey cloth, with a little cowl, a chaperon, and cloak, of the ſame; having a girdle of rope, or cord, tied with three knots: whence the name.

The Cordeliers are otherwiſe called *Minor Friars*, their original name. The denomination Cordelier is ſaid to have been firſt given them in the war of St. Louis againſt the Infidels; wherein the *Friars Minor* having repulſed the Barabians, and that king having inquired their name, it was anſwered, they were people *cordeliez*, tied with ropes. The Cordeliers are, to a man, profeſſed Scotiſts.

CORDELIER, *Order of*, in *Heraldry*. Anne de Bretagne, after the death of her firſt huſband, Charles VIII., inſtituted this order in 1498, for widow ladies of noble families.

The badge was a Cordelier's girdle argent, and was placed round the eſcucheon of their arms. It was alſo worn round the waiſt, with the ends hanging down. This order, however, ſoon after the deceaſe of the founder, fell into diſuſe.

CORDEMOI, Gerard de, in *Biography*, a native of Paris, deſtined by his friends for the bar; the ſtudies preparatory to which he neglected for the more alluring purſuits of philoſophy. On this ſubject he wrote ſome treatiſes, that recommended him to Boſſuet, by whoſe influence he was appointed reader to the dauphin. For the inſtruction of that prince, he ſtudied with much aſſiduity the hiſtory of France, and the reſult of his labours were publiſhed in two volumes, folio, ſoon after his death, which happened in 1684. This work did not obtain from the French that praiſe which it juſtly merited. By ſome Engliſh hiſtorians it has been more worthily appreciated; as well on account of the purity of its ſtyle, as from the depth of its reſearches. M. Cordemoi was elected a member of the French academy in 1675. Beſides his Hiſtory of France, we have a 4to. volume of his works, publiſhed in 1702. In the latter part of his life, he was aſſiſted in his literary labours by his ſon Lewis, who was born in 1651, and who became ſucceſſively a licentiate of Sorbonne, and an abbot in the dioceſe of Clermont. He was a voluminous writer, chiefly on theological ſubjects; and was conſidered among the Catholics as an able advocate of their cauſe, againſt the attacks of the defenders of Proteſtantiſm. He was, however, of conſiderable ſervice to his father, in the latter part of his General Hiſtory of France; and, it is believed, wrote the whole of that part which extends from about the concluſion of the reign of Lewis V. to the end of the work. By order of Lewis XIV. he continued that hiſtory from the time of Hugh Capet until the year 1660, which he did not live to finiſh. He died at the age of 71, in the year 1722. Moreri.

CORDERIE, *Fr.* a rope-yard. A ſort of work-houſe or place convenient for making, both for the artillery and veſſels, cords, cables, hawſers, &c. In inland towns, the corderies are open and uncovered, and commonly on the rampart, along by the walls; and in maritime towns, or ſea-ports, where conſiderable armaments are made, they are uſually low buildings, covered, long, and narrow, conſtructed near the arſenals and magazines. Theſe laſt mentioned corderies have generally, in France, been called *Corderies Royales*, becauſe the moſt of them were built and kept up at the expence of the king.

CORDES, in *Ancient Geography*, a river of Aſia, in Meſopotamia, which, riſing in the mountains, purſued its courſe to the ſouth, and encompaſſing the town of Dara, was loſt in a gulf near it.

Cordes, Balthasar, in *Biography*, born at Antwerp, in the year 1592, belonged to the ſociety of Jeſuits in the Low Countries, and was doctor of theology at Vienna, where he attained a conſiderable ſhare of celebrity, as profeſſor of that faculty. He was a man of great learning, particularly in Greek literature. His principal works, as editor and author, were, "S. Dionyſii Areopagitæ Opera omnia, Gr. et Lat., cum Scholiis, &c." in 2 tom. fol.; "Expoſitiones Patrum Græcorum in Pſalmos," in 3 tom. fol. He died at Rome, in the year 1650.

Cordes, John de, was born at Limoges, in the year 1570, and at an early age diſcovered a conſiderable turn for literary purſuits, in which he would probably have been encouraged, but the death of his father obliged him to apply to trade. When he was about 30 years of age, a change of circumſtances enabled him to relinquiſh buſineſs, and to indulge his original propenſity. He entered himſelf with the ſociety of Jeſuits at Avignon; but a ſeries of ill health obliged him to quit their ſeminary, and to purſue his ſtudies privately. He afterwards became a canon of his native place, and a collector of rare and valuable books. He was himſelf an author and editor of conſiderable reputation; and after his death, which happened in 1642, his library was purchaſed by cardinal Mazarine. He was editor of the works of Hincmar, archbiſhop of Rheims; and of the works of George Caſſander. He tranſlated father Paul's "Hiſtory of the Differences between Pope Paul V. and the Republic of Venice;" and likewiſe Camillo Portio's "Hiſtory of the Troubles in the Kingdom of Naples, under Ferdinand I." Moreri.

Cordes, in *Geography*, a ſmall town of France, in the department of the Tarn, on the river Ceron; 12 miles N.W. of Alby. It is the chief place of a canton, in the diſtrict of Gaillac, and counts 2303 inhabitants. The canton contains 24 communes, upon 185 kiliometres, with 8019 inhabitants.

Cordes *Toulouſianes*, a town of France, in the department of the Upper Garonne; 20 miles N.W. of Thoulouſe.

CORDESHAGEN, a town of Germany, in the circle of Upper Saxony, and duchy of Pomerania; 10 miles W. of Coſlin.

CORDESSE, a town of France, in the department of the Saone and Loire, and diſtrict of Autun; 2 leagues N. of Autun.

CORDEVATO, a town of Italy, belonging to the ſtate of Venice, in the country of Friuli; 5 miles N. of Concordia.

CORDEVOL, a river of Italy, which runs into the Piavo, between Belluno and Feltri.

CORDIA, in *Botany*, (named by Plumier in honour of Euricius Cordus and his ſon Valerius, two German botaniſts of the ſixteenth century, the former author of Botanologicon, ſeu Colloquium de variis Herbis; the latter of Annotations on Dioſcorides, and of a Hiſtory of Plants in four books with figures.) Linn. Gen. 256. Schreb. 350. Willd. 396. Lam. Ill. 270. Juſſ. 128. Vent. 2. 382. (Sebeſtena; Gært. 474.) Claſs and order, *pentandria monogynia.* Nat. Ord. *Aſperifoliæ*, Linn. *Borragineæ*, Juſſ. *Sebeſtenæ*, Vent.

Gen. Ch. *Cal.* Perianth one-leafed, tubular, or bell-ſhaped, toothed or deeply divided. *Cor.* monopetalous, generally funnel-ſhaped, ſometimes campanulate or wheel-ſhaped; tube about the length of the calyx, often enlarging upwards; border erect-ſpreading; generally cut into five, ſometimes four, ſix, ſeven, or eight obtuſe diviſions. *Stam.* generally five, ſometimes four, ſix, ſeven, or eight, awl-ſhaped, inſerted into the tube; anthers oblong. *Piſt.* Germ ſuperior, roundiſh, acuminate; ſtyle twice bifid; ſtigmas obtuſe. *Peric.* Drupe globular or egg-ſhaped, growing to the calyx; nut furrowed or pitted, two or four-celled; ſome of the cells frequently abortive. *Seeds* ſolitary, egg-ſhaped, acuminate at the ſummit.

Eſſ. Ch. Style twice bifid. Drupe with two or four-celled nuts.

Sp. 1. C. *Myxa.* Aſſyrian plum. Linn. Sp. Pl. 1. Mart. 1. Poiret in Encyc. 1. Mart. 1. Myxa ſeu ſebeſten. J. Bauh. Hiſt. 1. 197. Rai. Hiſt. 1555. Sebeſtena ſilveſtris et domeſtica. C. Bauh. Pin. 446. Proſp. Alp. Egypt. 30? Cornus ſanguinea; Forſk. Egypt. arab. 33. "Leaves egg-ſhaped, ſmooth above; corymbs lateral; calyxes ten-ſtriated." *β. officinalis*; Lam. Ill. 1895. tab. 96. fig. 3. Sebeſtena officinalis; Gært. tab. 76. fig. 1. Sebeſtena domeſtica, ſeu Myxa; Comm. Hort. 1. 139. tab. 72. Blackw. tab. 398. Prunus ſebeſtena, longiore folio; Pluk. Almag. 306. tab. 217. fig. 3. Vidi-maram; Rheed. Mal. 4. 97. tab. 37. Rai. Hiſt. 1563. Burm. Flor. ind. 58. "Leaves egg-ſhaped, rather acute, unequally ſerrated above; calyx ſomewhat cylindrical, even-ſurfaced." *Leaves* like thoſe of alder, ſerrate-angular, ſcabrous underneath. Linn. A middle-ſized tree. *Trunk* thick; wood whitiſh; bark ſcaly, marked with purple lines; branches and branchlets very ſmooth and even ſurfaced, cinereous, dotted. *Leaves* alternate, petioled, large, narrowed at the baſe, enlarged, rounded, and a little acute at the ſummit, entire towards the baſe, toothed or almoſt ſlightly ſinuated on the upper part; teeth unequal, diſtant, acute or obtuſe; nerves lateral, oblique, projecting; veins reticulated; petioles ſmooth, cylindrical, little more than one-third of the length of the leaves. *Flowers* white, ſweet-ſcented, in a large, cloſe, terminal panicle, conſiſting of lateral branches with a few ſhort ramifications: calyx green, cylindrical, five-cleft; diviſions of the corolla five or ſix, open, a little reflexed. *Drupe* black, oval, acuminate, ſmooth, pulpy; nut deeply furrowed, perforated; naturally four-celled, but two of the cells generally abortive or quite obliterated. α. a native of Egypt; β. of the Eaſt Indies. Poiret aſſerts that it is not eaſy to determine what was the myxa of Linnæus, and thinks it probable that two ſpecies have been confounded, but though the African and the Eaſt Indian plants differ a little in habit, and in the form of their leaves, he has, for the preſent, conſidered them only as varieties. A more accurate knowledge of their flowers and fruit will be neceſſary before they can be pronounced to be abſolutely diſtinct. The fruit has been eſteemed a valuable medicine in diſorders of the cheſt and urinary paſſages, but is now entirely out of uſe in England. The Eaſt Indians eat it macerated in ſalted vinegar, and reckon it ſerviceable in diarrhœas. An excellent glue is made of the pulp, which is more viſcid than that of the Jujube. 2. C. *lutea*. Lam. Ill. 1897. Poir. 15. "Leaves egg-ſhaped, obtuſe, crenate near the ſummit; corymbs lateral and terminal; calyxes ten-ſtriated." A ſhrub twelve or fifteen feet high; branches zig-zag, ſmooth, cinereous, pubeſcent on their upper part. *Leaves* alternate, petioled, ſcabrous on both ſides, marked on the upper ſurface with ſmall whitiſh joints, a little pubeſcent underneath when young; petioles pubeſcent, half the length of the leaves. *Flowers* yellowiſh; peduncles very ſhort; calyxes whitiſh, ſtrongly ſtriated, four-toothed, a little ſcarious at the edges; tube of the corolla the length of the calyx; border open, with ſix, ſeven, or eight diviſions; ſtamens eight; filaments erect, filiform, villous at the baſe; anthers oval, compreſſed; ſtyle the length of the ſtamens. *Drupe* whitiſh, egg-ſhaped; not terminated by a recurved point, four-celled, two of the cells frequently abortive. Found by Dombey at Huanxa and in the neighbourhood of Lima, where it is very common. La Marck enquires whether it may not be the myxa of Linnæus, excluding all the ſynonyms; but there can be no ground for the conjecture, as Linnæus certainly referred to a plant of the old continent. 3. C. *obliqua*. Willd. 2. Phyt. 1. 4. tab. 4. fig. 1. (C. myxa γ. Poir.) "Leaves roundiſh, heart-ſhaped, nerved, veined, oblique. Nearly allied to C. myxa, but the leaves are quite entire and the calyxes not ſtriated. A native of the Eaſt Indies. 4. C. *monoica*. Willd. 3. Roxb. Coromand. 1. 43. tab. 58. "Leaves roundiſh, egg-ſhaped, toothed, veined, ſcabrous; corymbs axillary, monœcious." *Leaves* three inches long or more, two inches broad, alternate, very ſcabrous, acute; petioles about one-third of the length of the leaves. *Flowers* white, ſmall, in axillary or terminal corymbs, which are ſhorter than the leaves; corolla funnel-ſhaped, with five egg-ſhaped obtuſe diviſions; ſtamens within the tube of the corolla; filaments awl-ſhaped, enlarged at the baſe, anthers lanceolate. *Drupe* yellowiſh, globular, pointed, filled with a glutinous pulp. A native of foreſts on the coaſt of Coromandel. 5. C. *ſerrata*. Juſſ. Poir. 3. "Leaves heart-ſhaped, acutely ſerrated; panicle terminal." *Branches* erect, cylindrical, ſmooth and even. *Leaves* about three inches long and two broad, alternate, petioled, egg-ſhaped, acute or ſomewhat acuminate, irregularly ſerrated, membranous, dark-green above, yellowiſh-green underneath; nerves ſimple, alternate. *Flowers* in a cloſe, ſomewhat conical, panicle, a little leafy at the baſe of its firſt branches, ſmall, white; calyx and border of the corolla five-lobed; ſtamens five. A native of the Eaſt Indies; deſcribed from a dried ſpecimen without fruit in the herbarium of Juſſieu. 6. C. *ſubcordata*. Lam. Ill. 1899. Poir. 4. (Novella nigra, ſeu talamari; Rumph. Amb. 2. 226. tab. 75?) "Leaves ſomewhat heart-ſhaped, entire, even on its upper ſurface; calyx cylindrical." A tree. *Branches* ſpreading, tufted, ſmooth. *Leaves* from four to ſix inches long or more, and nearly as many broad, alternate, ſlightly pubeſcent underneath along the principal nerves. *Flowers* in ſhort, looſe, terminal racemes, large, white with a reddiſh tinge; calyx tubular, ſmooth, three-toothed; corolla funnel-ſhaped, wrinkled or plaited; tube at leaſt twice the length of the calyx, much enlarged near the top; border with ſix or ſeven roundiſh lobes; ſtamens ſix or ſeven; anthers verſatile; ſtyle ſhorter than the ſtamens. *Drupe* the ſize of a hazel-nut, four-celled; ſome of them abortive. Diſcovered by Commerſon in the Praſlin Iſlands in the Eaſt Indies. 7. C. *collococca*. Linn. Sp. Pl. 5. Mart. 6. Poir. 5. Willd. 14. (C. chretioides; Lam. Ill. 1902? C. foliis rugoſis; Brown Jam. 167. Ceraſo affinis; Sloan. Jam. 169. hiſt. 2. 95. tab. 203. fig. 2. Ceraſa americana; Pluk. Phyt. tab. 158. fig. 1.) "Leaves oblong-ovate (cordate-ovate; ſyſt. nat.) quite entire; flowers in corymbs; calyxes tomentous on the inner ſide." A middle-ſized tree. *Trunk* divided near the top into ſpreading branches. *Leaves* alternate, petioled, acute, wrinkled. *Flowers* yellowiſh-green, in looſe ſomewhat-panicled terminal corymbs; peduncles branched, very unequal; corolla funnel-ſhaped, with five deep diviſions. *Drupes* bright red, the ſize of a ſmall cherry, with a ſweetiſh clammy pulp. A native of the Weſt Indies, where the fruit is a favourite food of turkies and other poultry. In Jamaica it is called clammy cherry, or turkey-berry tree. 8. C. *hirſuta*. Willd. 15. (C. collococca; Aub. Guian. 1. 219. tab. 86. C. nodoſa; Lam. 1905. Poir. 8.) "Leaves oblong, attenuated both ways, pubeſcent; flowers in terminal and axillary corymbs; peduncles hirſute." *Leaves* narrower than thoſe of the preceding ſpecies. *Stem* and *peduncles* hirſute. *Corymbs* denſe, ſomewhat umbelled, not dichotomous-divaricated. *Fruit* white, oblique, acuminate. A native of Cayenne and Guiana. 9. C. *tetrandra*. Lam. Ill. 1909. Poir. 11. Willd. 16. Aubl. Guian. 1. 222. tab. 87. "Leaves egg-ſhaped, ſomewhat heart-ſhaped, acute, ſcabrous underneath; corymb or cyme terminal; flowers tetrandrous." A tree forty or fifty feet high, with ſpreading branches. *Leaves* eight or ten inches long, three or four broad, alternate, entire or ſlightly undulated, nerved; petioles an inch long. *Flowers* greeniſh; common peduncle forked, dichotomous at the ſummit, and branched; calyx top-ſhaped, with four roundiſh acute lobes; corolla funnel-ſhaped; tube ſhort, border expanding, four-lobed; ſtamens four. *Drupe* whitiſh, round; nuts three or four-celled; ſomewhat oval, wrinkled, enveloped in a white gelatinous ſubſtance. A native of Cayenne and Guiana. 10. C. *tetraphylla*. Lam. Ill. 1908. Poir. 6. Willd. 18. Aubl. 1. 422. tab. 88. "Leaves four in a whorl, inverſely egg-ſhaped, quite entire; peduncles lateral, many-flowered." A ſhrub ſix or ſeven feet high, with knotty branches. *Leaves* nearly ſeſſile, firm, nerved, a little reticulated, ſmooth on both ſides. *Flowers* white, ſeſſile, on long common peduncles; calyx with five acute teeth; corolla funnel-ſhaped; tube narrowed at the baſe; border five-lobed; ſtamens longer than the corolla. *Drupe* yellowiſh, the form and ſize of an olive; not very hard, generally one-celled. A native of Guiana, on ſandy ſoil near the ſea. 11. C. *geraſcanthus*. Linn. Sp. Pl. 2. Mart. 4. Lam. 1903. tab. 96. fig. 2. Poir. 7. Jacq. Stirp. Amer. 43. tab. 175. fig. 16. Brown Jam. 170. tab. 29. fig. 3. "Leaves lanceolate-egg-ſhaped, quite entire; panicle terminal; calyxes tomentous, ten-ſtriated." A conſiderable tree. *Branches* ſpreading, cylindrical, clothed on the upper part with a thickiſh cinereous down. *Leaves* alternate, ſmooth, coriaceous, on ſhort petioles. *Flowers* rather large, white, permanent, ſhrivelling; principal branches of the panicle furniſhed at the baſe with narrow ſeſſile bractes; pedicels ſhort, unequal, three-flowered; calyx oblong, funnel-ſhaped, ſlightly toothed; corolla twice the ſize of the calyx, with four, five, or ſix almoſt oval obtuſe diviſions; filaments faſtened to the tube of the corolla, from the baſe to the middle; anthers incumbent, yellow; germ oblong, ſtriated; ſtyle ſhorter than the ſtamens; ſtigmas thick, obtuſe, yellow. A native of Jamaica, where it is eſteemed one of the beſt timber-trees. 12. C. *flaveſcens*. Poir. 9. Aubl. 1. 226. tab. 89. (C. ſarmentoſa; Lam. Ill. 1907.) "Leaves ovate-oblong, acuminate, ſmooth, quite entire; racemes lateral; drupes obtuſe." A ſhrub, producing from the roots ſeveral woody, ſarmentous ſtems, eight or nine feet long, ſpreading upon the neighbouring plants and trees. *Leaves* alternate, petioled, nerved, reticularly veined, ſix or ſeven inches long, and three broad. *Flowers* yellowiſh, in lateral racemes, on a rather long common peduncle; calyx with five or ſix deep, roundiſh, acute diviſions; corolla funnel-ſhaped; tube enlarged above the calyx; border with four or ſix round, ſpreading lobes; ſtamens five or ſix; anthers arrow-ſhaped; germ greeniſh. *Drupe* purpliſh; nut enveloped with a dry and firm membrane. *Seeds* affording a glutinous matter. A native of Cayenne and Guiana. 13. C. *ſpineſcens*. Linn. Mant. 206. Mart. 2. Lam. 1904. Poir. 10. Willd. 4. "Leaves egg-ſhaped, acute, ſerrated, ſcabrous; petioles becoming thorns." *Branches* ſtiff, erect, tomentous, ferruginous. *Leaves* alternate, tomentous underneath; petioles very ſhort, jointed, breaking off at the joint when the leaves fall, the part that remains ſharpening into a thorn, as in volkameria. *Flowers* in axillary, ſimple, or bifid racemes, equal in length to the leaf; calyx campanulate, with five obſcure teeth; corolla campanulate, five-toothed, twice the length of the calyx; ſtigmas acute. *Drupes* black, ſeſſile, about the ſize of gooſeberries. 14. C. *toqueve*. Lam. 1911. Poir. 12. Willd. 10. Aubl. Guian. 1. 228. tab. 90. "Leaves cordate-ovate, acuminate, quite entire, villous; racemes compound." A much-branched, ſpreading ſhrub, five or ſix feet high; branchlets brittle, villous, ruſſet. *Leaves* from four to ſix inches long, three or four broad, alternate, nearly ſeſſile, rough and villous above, tomentous and pale green underneath. *Flowers* white, in axillary and terminal racemes; common peduncle long, villous, leafleſs; calyx almoſt tubular, five-toothed; tube of the corolla ſhort; border ſpreading, with five roundiſh lobes; ſtamens five; filaments the length of the corolla; germ a little villous at the ſummit. *Drupe* yellowiſh, fleſhy, one-celled. A native of Guiana. 15. C. *macrophylla*. Linn. Sp. Pl. 4. Mart. 5. Lam. 1901. Poir. 13. Redouté Pict. Muſ. Par. Annals of Muſeum of Nat. Hiſt. vol. i. Annals of Botany, 1. 127. (Colococcus platyphyllus; Brown Jam. 168. Prunus racemoſa foliis maximis; Sloan. Jam. 184. Hiſt. 2. 130. tab. 221. fig. 1.) "Leaves ovate-oblong, villous, veined, very large; racemes forming a corymb; calyx cup-ſhaped." A tree from forty-five to ſixty feet high. *Trunk* never more than ſixteen inches thick; branches cylindrical, villous while young, ſeveral times two or three-forked, diverging, and declined towards the earth. *Leaves* from ſix to thirteen inches long, from three to ſeven broad, alternate, deflected, clothed with ſhort rough ſcattered hairs, entire, or edged with ſmall ſharp teeth; nerves obliquely tranſverſe, prominent underneath; petiole ſhort, cylindrical, channelled. *Flowers* white; calyx oval, villous, with five upright, ſtraight, obtuſe teeth; tube of the corolla cylindrical, entirely villous; ſegments of the border elliptical, deflected, a little curled, rounded at the tip; ſtamens five, longer than the corolla; anthers verſatile, with two cells ſeparated at the baſe, and attached to the filaments by their backs; germ oval, acute. *Drupe* red, ſpherical, about the ſize of a pea, two-celled. A native of Jamaica. 16. C. *ſebeſtena*. Linn. Sp. Pl. 3. Mart. 3. Lam. 1898. tab. 96. fig. 1. Poir. 14. Willd. 5. Bot. Mag. 794. Bot. Rep. tab. 157. (C. foliis ſubrepandis; Jacq. Amer. 42. C. nucis juglandis folio; Plum. Gen. Amer. 105. C. foliis amplioribus; Brown Jam. 202. Sebeſtena ſcabra; Dill. Elth. 341. tab. 255. fig. 331. Caryophyllus ſpurius; Sloan. Jam. 136. Hiſt. 2. 20. tab. 64. Cateſb. Car. 2. 91. tab. 91. Novella nigra; Rumph. Amb. 2. 226. tab. 75. Brown Fl. Ind. 59.) "Leaves egg-ſhaped, ſomewhat repand, ſcabrous; calyx cylindrical." A ſhrub ſeven or eight feet high. *Stems* ſeveral, erect, ſmooth, cylindrical, branched. *Leaves* alternate, on ſhort petioles, ſlightly ſerrated when young, the older ones more or leſs repand, the upper ones entire. *Flowers* deep yellow or ſcarlet, in large terminal racemes; pedicels one, two, or three-flowered; calyx with three diviſions near the top; corolla funnel-ſhaped; border with five oval, obtuſe, crenulate diviſions; ſtamens five; ſtigmas recurved. *Drupe* inverſely pear-ſhaped; nut deeply furrowed. A native of the Eaſt and Weſt Indies. It is not improbable that the above quoted ſynonyms refer to more than one ſpecies; but no botaniſt has hitherto found ſufficiently diſcriminating ſpecific characters. The Eaſt Indian plants have yellow, the Weſt Indian ſcarlet flowers. 17. C. *africana*. Lam. 1896. (C. ſebeſtena β; Poir. Willd. Sebeſtena alpini? Lam. Wanzey; Bruce's Travels, 5. 57, with a figure.) "Leaves roundiſh-oval, entire; panicle terminal; calyxes top-ſhaped; nut of the drupe triquetrous." A tree. *Trunk* dividing into four or five thick branches, about three feet and a half from the ground. *Flowers* ſnow-white, funnel-ſhaped, entire, and folded back at the margin. A native of Abyſſinia. 18. C. *aſpera*. Willd. 6. Forſt. Prod. 109. "Leaves egg-ſhaped, acuminate, rough; flowers in cymes, wrinkled." A native of the iſland of Tongatabu. 19. C. *dichotoma*. Willd. 7. Forſt. 110. "Leaves oblong-egg-ſhaped, ſcarcely crenate; corymbs dichotomous." A native of New Caledonia. 20. C. *ſalvifolia*. Poir. 16. "Leaves ovate-lanceolate, obtuſe, wrinkled, very rough, reticularly veined underneath; racemes lateral." *Branches* ſmooth, ſtriated, cinereous, or yellowiſh, ſomewhat pubeſcent when young. *Leaves* two inches long, one inch broad, alternate, very firm, coriaceous; petioles two or three lines long, ſhort, firm, rough. *Racemes* ſtiff, villous, beſet with whitiſh hairs. Native country unknown, communicated by Dupuis to Juſſieu, and preſerved in his Herbarium. 21. C. *domingenſis*. Lam. 1900. "Leaves egg-ſhaped, entire, rough, whitiſh underneath; panicle terminal; calyxes cylindrical." *Branches* dark brown, thick, angular, very rough. *Leaves* from ſix to eight inches long, four or five broad, alternate, thick, coriaceous, nerved, reticularly veined; petioles almoſt cylindrical, ſhort, thick, very rough. *Flowers* in panicled racemes, ſhorter than the leaves; racemes unequal, erect, cylindrical, ſtiff, ſcabrous, a little pubeſcent; pedicels one-flowered. A native of St. Domingo. 22. C. *lævigata*. Lam. Ill. 1912. Poir. 18. "Leaves egg-ſhaped, veined, ſhining; panicles lateral; ſtamens villous near the baſe." *Branches* ſlender, filiform, cinereous, cylindrical, knotty. *Leaves* alternate, petioled, rather ſmall, quite entire, obtuſe, or a little acute, narrowed at the baſe, coriaceous, ſmooth on both ſides, reticularly veined. *Panicles* ſhort, but longer than the leaves, ſmooth, branched; calyxes ſmooth, ſhort, ſtriated; corolla open, ſomewhat campanulate; border five-lobed. A native of the Weſt Indies. 23. C. *ſenegalenſis*. Juſſ. MSS. Poir. 19. "Flowers tetrandrous; leaves membranous, egg-ſhaped, acute, ſmooth; racemes ſhort." A tree about twenty feet high. *Branches* dark brown, ſlender, cylindrical, quite ſmooth. *Leaves* alternate, four or five inches long, about three inches broad, thin, nerved, and reticularly veined; petioles two inches long and more, ſmooth, compreſſed. *Flowers* in panicled racemes, ſcarcely longer than the petioles; pedicels very ſhort, one-flowered; calyx with three diviſions; corolla with four diviſions half way down. Brought from Senegal by Adanſon. 24. C. *exaltata.* Lam. Ill. 1910. Poir. 21. "Leaves egg-ſhaped, acute at the baſe, rough; corymb terminal; flowers quinquefid." A large tree. *Branches* ſmooth, ſtriated. *Leaves* about four inches long and two broad, alternate, quite entire, obtuſe, ſomewhat acuminate, coriaceous, almoſt ſhining; petioles very ſhort, ſtriated, ſlightly compreſſed. *Corymb* a little longer than the leaves; pedicels very ſhort, thick, one-flowered, calyx ſhort, ſmooth, campanulate, with five ſmall acute teeth. *Drupe* globular, the ſize of a pea, two-celled. A native of Guiana. 25. C. *nervoſa.* Lam. Ill. 1906. Poir. 22. "Leaves alternate and oppoſite, ovate-oblong, acuminate, nerved; panicle ſhort; bractes awl-ſhaped." A tree. *Branches* cinereous, thick, angular, rough. *Leaves* from eight to ten inches long, four or more broad, alternate, entire, ſmooth, deep green and ſhining above, pale yellow underneath; nerves ſtrong, oblique, parallel, a little branched or confluent towards the edges of the leaf; petioles very ſhort, thick, knotty at the baſe. Firſt diviſions of the panicle almoſt dichotomous; branches ſhort, thick, almoſt woody, ſmooth: calyxes ſmooth, with five ſhort oval diviſions. A native of Guiana. 26. C. *rotundifolia.* Poir. 23. Ruiz. and Pav. Flor. Peruv. 2. 24. tab. 148. Prunus Sebeſtena; Pluk. Almag. 306. Phytog. tab. 217. fig. 2. "Leaves roundiſh and oval, crenate, ſcabrous; peduncles corymbo-dichotomous." A ſhrub about twelve feet high. *Stems* ſtraight, often almoſt procumbent, cylindrical; branches numerous, very long, ſupple, zig-zag, villous when young. *Leaves* from two to three inches long, and two broad, alternate, petioled, wrinkled, veined, rough, rather hiſpid. *Flowers* yellow, large; calyx tubular, ſtriated, with five ſhort acute teeth; corolla funnel-ſhaped; tube the length of the calyx, dilated at the orifice; border with five plaited, oval, acute diviſions; filaments awl-ſhaped, villous at the baſe; anthers oval-oblong, concave; germ oval, acuminate; ſtyle the length of the ſtamens. *Drupe* whitiſh, half enveloped by the calyx and a viſcid pulp; nut oval, acuminate, five-furrowed, two-celled. The fructification often varies from ſix to eight in the number of its parts. A native of Peru, in dry ſandy ground, and by the ſides of the roads. 27. C. *dentata.* Poir. 24. "Leaves egg-ſhaped, angularly-cut, toothed; panicle dichotomous, large, divaricated, branches petioled, hirſute." *Branches* a little zig-zag, brown or cinereous, cylindrical, rough, cloathed with ſhort ſtiff whitiſh hairs. *Leaves* from three to five inches long, from two to four broad, alternate, rough with ſmall whitiſh points and deep green above, paler and yellowiſh underneath; ſome ſcarcely toothed, others moderately cut, a little angular, with ſhort acute teeth; nerved and reticularly veined; petioles about an inch long, ſlender, cylindrical, villous. *Flowers* white, almoſt campanulate; panicle terminal; ramifications numerous, growing gradually ſhorter, ſtiff, pubeſcent: pedicels very ſhort, one-flowered; calyx ſhort, almoſt campanulate; tube of the corolla ſhort, dilated at the orifice; border large, very open, with five or ſix very ſhort lobes. A native of Curaçao. 28. C. *micranthus.* Mart. 11. Poir. 25. Willd. 12. Swartz. Prod. 47. Flor. Ind. Occid. 1. 460. "Leaves elliptical, acute, entire, membranous, veined; racemes compound, looſe." *Branches* cinereous, a little twiſted, wrinkled, ſmooth. *Leaves* alternate, coriaceous, quite entire, deep green and almoſt ſhining above, paler underneath, obtuſe or ſomewhat acuminate; petioles ſhort, ſtriated. *Flowers* very ſmall; calyx very ſhort, ſmooth, ſtriated. A native of Jamaica on woody mountains. 29. C. *ſinenſis.* Lam. 1914. Poir. 26. "Leaves oblong, obtuſe, villous at the axils of the nerves; panicles ſhorter than the leaves." *Branches* ſlender, filiform, ſmooth, ſomewhat ſtriated, cylindrical, ſlightly compreſſed near the ſummit. *Leaves* two or three inches long, half an inch broad, alternate, quite entire, a little narrowed at the baſe; petioles filiform, leſs than an inch long, ſmooth. *Flowers* whitiſh, in lateral and terminal panicles; calyx whitiſh green, ſhort, open, campanulate after the time of flowering, ſmooth, four or five-lobed, obtuſe at its orifice; corolla funnel-ſhaped, lobed, about twice the length of the calyx. *Drupe* ſmall, oval, nut two-celled. A native of China. 30. C. *indica.* Lam. Ill. 1913. Poir. 27. "Leaves egg-ſhaped, petioled, naked; flowers panicled; tube of the corolla entirely concealed in the calyx." *Branches* ſmooth, cylindrical, long. *Leaves* from one to four inches long, from one to two broad, alternate, quite entire, obtuſe or ſomewhat obtuſe, membranous, ſmooth, nerved and reticularly veined; petioles an inch and half long, ſlender, ſupple. *Flowers* in long lateral and terminal branched panicles; branches alternate, terminated by ſmall penduious racemes; pedicels ſhort, unequal; calyx whitiſh, campanulate, ſmooth, lobed and appearing gnawed at the edge, very open after the time of flowering; corolla ſmall; border ſhort, open. *Drupes* ſmall, oval, two-celled. A native of the Eaſt Indies; diſcovered by Sonnerat. 31. C. *elliptica.* Mart. 12. Poir. 28. Willd. 12. Swartz. Prod. 47. Flor. Ind. Occid. 1. 461. "Leaves oblong, attenuated at the tip, entire, ſomewhat coriaceous; racemes compound, diffuſe; drupes acuminate." A large tree with ſpreading branches. *Leaves* alternate, ſmooth on both ſides, ſhining, nerved and veined; petioles ſemi-cylindrical, channelled underneath, ſmooth. *Flowers* white, in terminal racemes, almoſt ſeſſile, unilateral; calyx coriaceous, elliptical, tubular, ſmooth, from two to five-cleft; tube of the corolla enlarged at its baſe, ſcarcely longer than the calyx; border with five linear, lanceolate, reflexed diviſions; filaments bearded; anthers oblong, inclining, glandular at the ſummit; germ oblong; ſtyle cylindrical. *Drupe* about ſix lines long, ſupported by the enlarged very open calyx; nut wrinkled. A native of Jamaica and St. Domingo. 32. C. *patagonula.* Mart. 7. Willd. 17. Hort. Kew. 1. 259. (Patagonula americana; Linn. Sp. Pl. Lam. Ill. 271. Pl. 96. Poir. Dill. Elth. 306. tab. 226. fig. 293.) "Leaves oblong-lanceolate, ſmooth on both ſurfaces; upper part ſerrated; branchlets hairy." A ſhrub, with the habit partly of privet and partly of alaternus. *Stem* ſtraight, cinereous, ſpotted with white; ends of the branches covered with long hairs. *Leaves* alternate, obtuſe or acute, entire and narrowed into a petiole at the baſe. *Flowers* in a kind of terminal corymb; calyx very ſmall, but much enlarged after the time of flowering, with five deep diviſions; corolla wheel-ſhaped: tube very ſhort; border flat, with five oval acute diviſions; filaments five, as long as the corolla; anthers ſimple; germ oval, acute; ſtyle permanent, the length of the ſtamens. *Fruit* an oval, acuminate capſule? A native of Patagonia.

This ſpecies, we believe, was firſt referred to cordia by Mr. Dryander in Hortus Kewenſis. Linnæus made it a ſeparate genus, partly on account of the enlargement of the calyx during the ripening of the fruit; but this is a circumſtance common to other ſpecies of cordia; and partly on account of the fruit which appears to be a capſule; it is, however, not ſufficiently known, and Juſſieu doubts whether it be really a capſule.

Cordia *retuſa;* Vahl. Mart. See Ehretia *buxifolia.*

Cordia, in *Gardening*, comprifes plants of the flowering ſhrubby exotic kind: of which the ſpecies moſtly cultivated is the ſebeſten or rough leaved cordia. (C. *ſebeſtena.*) See the preceding article. It is of a beautiful ſcarlet colour, making a fine appearance. A ſmall piece of the wood thrown on a pan of lighted coals perfumes the whole houſe with a moſt agreeable ſmell. It is ſaid to be from the juice of the leaves combined with that of the fruit of a ſpecies of fig, that the fine red colour with which they dye their cloths in Otaheite is manufactured.

Method of Culture. This is a plant which is raiſed by ſowing ſeeds obtained from the Weſt Indies as ſoon as poſſible after they arrive, in pots of light earth, plunging them in a common hot bed or bark bed, and when the plants have two or three months' growth pricking them out ſingly in ſmall pots, replunging them in the hot bed, to forward their rooting afreſh; being afterwards conſtantly continued in the ſtove or hot houſe. They require frequent watering in the ſummer ſeaſon.

Theſe are plants which are very ornamental in ſtove collections, where they can only be kept.

CORDIAL. See Cardiac.

Cordial *waters.* See *Compound* Waters.

CORDIERI, Niccolo, in *Biography*, called likewiſe by the Italians Il Franciofino, becauſe a native of France, was born in Loraine in the year 1567. He came to Rome in his childhood, and applied himſelf with unremitting aſſiduity to the ſtudy of deſign and modelling, as well from the fineſt remains of ancient art, as from the life. He ſoon became a ſculptor of conſiderable ability and eminence, inſomuch that he was more than once honoured by the viſits of the pontiffs Clement VIII. and Paul V. while at work. Amongſt his principal performances, which are enumerated by Baglione, are four large ſtatues in a chapel at Santa Maria Maggiore, repreſenting David, Aaron, St. Bernardo, and St. Athanaſius. This artiſt died at Rome in the year 1612, and was buried at the church of the Trinita del Monte. Baglione.

CORDIERS, Fr. rope-makers. There is an immenſe number of them employed in France for the uſe of the artillery. But there was a certain claſs of them who enjoyed barracks under part of the fortification of the arſenal on the river Seine and had the privilege of working there, under the walls of the arſenal, on condition of being always in readineſs to furniſh cordage for the artillery.

CORDILLERAS, in *Geography*. See Andes.

CORDON, in *Fortification*, is a row or layer of ſtones, rounded on the outſide towards the ditch, and placed between the termination or upper part of the ſlope of the wall or revetement, and that part of it, which is on the outſide of the parapet and ſtands perpendicularly. The cordon ſerves to prevent this difference between the lower and upper part of the revetement, from being offenſive to the eye, and is at the ſame time ornamental.

The cordon of the revetement of the rampart is often on a level with the terre-plain of the rampart. Certain writers are of opinion, that it might be placed to more advantage ſome feet lower, particularly when there is a wall in front of the parapet, and a ſpace between them for going the rounds and ſhielding them from the enemy's fire.

Cordon, in *Military Operations* and *Hiſtory*, is a chain of poſts, or an imaginary line of ſeparation, between two armies either in the field or in winter-quarters, or for covering a particular frontier or tract of country.

Cordon, in *Geography*, a ſmall iſland in the Pacific ocean, near the weſt coaſt of Nicaragua, at the entrance of the bay of Realejo.

Cordon-Jaune; the order of, or of the yellow ſtring, in France, was inſtituted by the Duke de Nevers in 1606, and aboliſhed the ſame year by Henry IV. of France.

Cordon, in *Ornithology*, a name given by Buffon to the Ampelis *cotinga* of Gmelin, and the purple-breaſted chatterer of Pennant and Latham.

CORDONA, or Cardona, in *Geography*, a mountain of Valentia in Spain, is compoſed entirely of rock-ſalt, 4 or 500 feet high and about 3 miles in circumference: Mr. Bowles informs us, that there are no traces of gypſum near this mountain, as in moſt ſimilar inſtances is the caſe. In the climate of Spain, this maſs of ſalt remains undiſſolved by the rains, or the waters of a river which waſhes it. Mr. Townſend carried a fragment of this ſalt with him through Spain, without the leaſt ſign of deliqueſcence, but on his return to England he ſoon found it ſurrounded by a pool of water, owing to the coldneſs and humidity of our atmoſphere. In Spain this rock-ſalt, like the fluorſpars of Derbyſhire, is employed to make ſnuff-boxes, vaſes, and other ornaments and trinkets.

CORDOVA, Adriano *of*, in *Biography*, ſo called from the place of his nativity, a conſiderable town in Spain, was a barefooted Carmelite who applied himſelf to hiſtorical painting with ſucceſs. It is regretted, however, that from a too great modeſty or diffidence of his own powers, he was induced to deface ſo many of his pictures as ſoon as he had finiſhed them. The few that remain are at Cordova, the moſt remarkable of which is a Crucifixion with St. John, Mary Magdalene, and other figures of half length, in the manner of Rafaele Sadelen, in the convent of the Carmelites. This artiſt died at Cordova in the year 1630. Cumberland.

Cordova, or *Cordoua*, in *Geography*, a city of Andaluſia in Spain, forming a kind of ſemi-circular amphitheatre on the right bank of the Guadalquivir, in an extenſive and fertile plain at the foot of that ridge of mountains, named the Sierra Morena, 84 miles N.E. of Seville; 112 N. of Malaga; 210. S.W. of Madrid, in N. lat. 37° 40′. It is the ancient *Corduba*, the firſt Roman colony in Spain, and probably on that account called *Colonia Patricia*, or ſimply *Patricia*, as appears from an inſcription on an antique marble in the church of St. Marina:

D. M. S.
M. Lucretius. Verna Patricienſis. Ann. LV.
Pius in Suos. H. E. S.
Sit T. T. Levis.

Cordova has been ſtyled the mother of men of genius. From the very foundation of this city it was the ſeat of learning and ſciences. Strabo ſays, that the ancient books of the Turdetani, their poetry, and their laws written in verſe, were preſerved at Cordova. Its academy was celebrated for rhetoric and philoſophy; it had alſo a Greek profeſſorſhip. The elder Seneca, and Lucius Annæus Seneca, preceptor to Nero, were born at Cordova, as well as Lucan the poet, whoſe grandfather Acilius Lucanus, celebrated for his eloquence, ſtudied here. So did Gallio, another famous orator; Portius Ladro, of whoſe works there remains one harangue; and Manelus, maſter of the elder Seneca. Tully, in his oration for the poet Archias, mentions ſeveral poets of Cordova who were eſtabliſhed at Rome among others, Sextilius Henna, of whoſe writings there is only one elegy extant, in which he laments the death of the Roman orator.

After the fall of the Roman empire, Cordova was ſubject to the dominion of the Goths, until the Gothic monarchy of Spain was overthrown by the Saracens, under the command of Tarik. A Roman captive and proſelyte who had been enfranchiſed by the caliph of Damaſcus, aſſaulted Cordova with ſeven hundred horſe. He ſurpriſed the town, and drove the Chriſtians into the great church, where they defended themſelves above three months; and of all the Spaniſh military chiefs the governor of Cordova is recorded as the only one, who fell, without conditions, a priſoner into the hands of the Saracens.

Abdelaziz, the ſon of Muſa, to whom the adminiſtration of Spain, under the caliph of Damaſcus, was confided, conceived the deſign of erecting an independent throne at Cordova; but no ſooner was a ſuſpicion of his intentions diffuſed than a powerful conſpiracy was formed againſt him. As he was repairing alone to the moſque of Cordova, he was attacked and murdered by the conſpirators.

On the aſſaſſination of Abdelaziz, Ayub aſſumed the adminiſtration of Spain. He was ſoon removed by the ſuperior favour or merit of Alahor, who, like Abderame one of his ſucceſſors, vainly attempted the conqueſt of the weſt.

Under twenty ſucceſſive lieutenants of the caliphs, Spain imbibed, in a few generations, the manners of the Arabs; and by aſſuming the name of Spaniards, the Arabs aſſerted their original claim of conqueſt.

In the mean time the rival houſes of Ommijah and of Abbas, the uncle of Mahomet, convulſed the eaſt by their pretenſions, from the Indus to the Euphrates. Their conteſt was decided on the banks of the Zeb. Mervan XIV., and laſt caliph of the houſe of Ommijah, was forced to yield to the enthuſiaſm of the Abbaſſides, conducted by Abdallah the uncle of his competitor. The vanquiſhed caliph croſſed the Euphrates, and without halting in Paleſtine, pitched his laſt camp on the banks of the Nile, where he was attacked by Abdallah, and the lance of an Abbaſſide terminated the reign and life of Mervan.

In the proſcription of the Ommiades, a royal youth of the name of Abdalrahman alone eſcaped from the rage of his enemies, and was received on the coaſt of Andaluſia with open arms. The Arabian chiefs, who reverenced the memory of the immediate ſucceſſors of Mahomet, drew their ſabres in his ſupport. The defeat of the Zeb was avenged on the banks of the Guadalquivir; that river was ſwelled with the bodies of the ſlaughtered Abbaſſides; and the throne of the victorious Abdalrahman was eſtabliſhed at Cordova in the year 755 of our era.

During a proſperous reign of thirty years, Abdalrahman I. encouraged agriculture, commerce, and the arts. Cordova became the centre of induſtry, of politeneſs, and of genius. His ſon Haſſam, who ſucceeded him, not only patronized, but was even a proficient in the arts. He finiſhed the famous moſque, which had been begun by his father, and threw over the Guadalquivir a bridge which remains a laſting monument of his ſkill.

Under the ſecond Abdalrahman a perpetual ſupply of pure water was conducted through pipes and aqueducts into the heart of Cordova, and numerous moſques augmented its magnificence.

Learning flouriſhed under Alkaham the ſecond. He founded the univerſity of Cordova, and the birth-place of the Senecas, and the Lucans, aſſerted again its pretenſions to literary fame. He collected ſo immenſe a quantity of manuſcripts, that before the end of his reign the royal library is reported to have contained the almoſt incredible number of ſix hundred thouſand volumes, of which the catalogue alone filled forty-four.

But the pomp of the third Abdalrahman, who reigned from the year 912 till 961, appears ſtill more incredible. His wives, concubines, and black eunuchs, amounted to ſix thouſand three hundred perſons. He was attended to the field by a guard of twelve thouſand horſe, whoſe belts and ſcimitars were ſtudded with gold. To perpetuate the name of his favourite Sultana, he conſtructed, three miles from Cordova, the palace and gardens of Zehra or Arizapha. The edifice was ſupported by above a thouſand columns of the fineſt marble; the walls of the hall of audience were incruſted with gold and pearls. A formidable army ſecured the proſperity which his dominions derived from his wiſe adminiſtration. The royal city of Cordova contained ſix hundred moſques, nine hundred baths, and two hundred thouſand houſes. Eighty large cities, three hundred towns, and twelve thouſand villages obeyed his ſway, and yet, in leſs than fifty years after his deceaſe, the kingdom of Cordova was diſſolved, and the houſe of Ommijah overwhelmed.

His ſon, Alkaham the ſecond, whom we have already mentioned as the founder of the univerſity of Cordova, died in 976, and left the throne to Haſſem his ſon, a feeble infant, and the reins of adminiſtration to the celebrated vizir Mahomet Abenamir, who from his valour acquired the ſurname of Almanzor or the Defender. He ſucceſsfully ſtruggled againſt civil and foreign commotion, and at his death, his renown was reſpected in his deſcendants. The office of vizir became hereditary in his family. His ſons ruled with a power as abſolute as that of the caliphs; their inſolence provoked the ambition of other chiefs; the excluſive pretenſions of the houſe of Ommijah were diſregarded, the grandſon of the great Abdalrahman was plunged into a dungeon, and the glory of the throne of Cordova, which under the Ommiades had ſhone with ſuch a luſtre, during a little more than two centuries, was overſhadowed by a long night. The limits of the Saracen dominions gradually receded. Several petty principalities were formed on the ruins of their empire, which was at length confined within the boundaries of Grenada.

In the mean time the univerſity of Cordova preſerved for a long period of years the reputation which it had acquired under Alkaham II. It was at Cordova that Avempace and Algazel, two ſages mentioned by St. Thomas, taught moral philoſophy; that Alial Cohacen and Aliebcn Rezel acquired their profound erudition; and that Abenzuel, the great aſtrologer and phyſician, ſurnamed the Wiſe, received his education. Within its walls were formed thoſe thirty philoſophers and phyſicians, who arranged the works which, under the name of Avicenna, were dedicated to prince Garalai, to whom they have been falſely attributed.

Among the learned Moors, to whom Cordova gave birth, are Albermarcar, Abramo, Meſulco, Raſhez Almanzor, known by a number of curious works, and a hiſtory of the conqueſt of Spain, Aben Regid who likewiſe wrote on the diviſion and conqueſt of Spain, and Averröes, called, by way of eminence, the commentator.

Cordova has preſerved nothing of its ancient grandeur, except a vaſt encloſure filled with houſes half in ruins. Its population from 300,000, which it was in the time of the Moors, is reduced to 15,000. Its long, narrow, and ill-paved.

paved ſtreets are almoſt deſerted; moſt of the houſes are uninhabited; and the multitude of churches and convents which it contains, are beſieged by a crowd of vagabonds covered with rags. Although the art of ſoftening leather and giving a brilliant poliſh to its ſurface was invented here, Cordova has but a few tan-yards. Its induſtry is confined to ſome manufactures of woollen cloth, ribbands, laces, and hats. Rents and proviſions are low; and the value of eſtates has fallen one half in the courſe of the century.

The biſhop of Cordova is ſuffragan of the archbiſhop of Seville. His annual income exceeds 3000*l.* ſterling. St. Raphael, the patron of Cordova, has a magnificent gilt ſtatue at one of the gates, which forms a ſingular contraſt with the wretchedneſs that reigns within the town.

The only remarkable edifice of Cordova is its famous cathedral, which formerly ſerved as a moſque to the Moors, and ſtill retains the name of Mezquita. It forms a long ſquare of one hundred and fifty-eight paces by one hundred and thirty-eight, and is well lighted, but too low. About ſix hundred columns of blackiſh marble placed in Quincunx are well preſerved; but they do not reach the ceiling; they are ſcarcely more than ten or twelve feet high, and have neither baſe nor capital; they are joined to each other by two arches placed one above the other, covered with plaiſter, and ſupported with ſtone work whitened over. The reſult of the whole is not altogether agreeable to the eye, and the cathedral is more remarkable for its oddity than for any very ſtriking beauties, though nothing would equal its magnificence were the height proportioned to the extent. Its exterior preſents only a maſſy and irregular edifice with enormous ſquare pillars.

By the ſide of the cathedral is a ſmall grove, the faſcinating remains of the taſteful luxury of the Moors. It is planted with orange-trees, the tufted foliage of which ſerves as an aſylum to great numbers of birds, and hangs over ſeveral fountains which conſtantly cool the air.

The ancient palace of the Moors has been converted into ſtables, in which one hundred ſtallions are uſually kept. Their genealogy is carefully preſerved; the name and age of each are written over the ſtall in which he ſtands. The beautiful horſe of Cordova is reckoned the moſt perfect. There is a curious manuſcript in the Eſcurial marked D.CCC.XCVII on horſes and horſemanſhip, written by a Mooriſh general, and dedicated to the third king of the race of Benneſſaret, who reigned in the year 1301.

The country round Cordova abounds in oranges and lemons, and produces excellent wine. Gibbon's Rome. J. Talbot Dillon's Travels through Spain, ſecond edit. 4to. London, 1782. Bourgoing's Tableau de l'Eſpagne. Peyron's Eſſays on Spain. F. A. Fiſcher's Travels in Spain, in 1797 and 1798.

Archbiſhop Roderic Ximenes, in his "Hiſtoria Arabum," informs us, that Cordova was paved ſo early as the middle of the ninth century, or about the year 850, by Abdalrahman II. the 4th Spaniſh caliph. This prince, who knew the value of the arts and ſciences, and who favoured trade ſo much, that in his reign abundance prevailed throughout the whole land, cauſed water to be conveyed into this city, which was then his capital, by leaden pipes, and ornamented it with a moſque, and other elegant buildings.

CORDOVA, a province of South America, being, by the new diviſion of 1782, an intendency of the viceroyalty of Buenos Ayres, about 100 leagues in length, and 70 in breadth, interſected by ſeveral chains of mountains, and watered by ſeveral rivers. This diſtrict is chiefly celebrated for woollen manufactures, being ſeated on the eaſtern ſide of a grand and high branch of the Andes.

CORDOVA, a neat clean town, in the above-mentioned diſtrict, diſtant 156 miles from Buenos Ayres, and pleaſantly ſituated near a wood, at the foot of a branch of the Andes. This town was founded about the year 1550, by Juan Nunez de Prado; and in 1570 erected into an epiſcopal ſee. Its chapter conſiſts of the biſhop, dean, archdeacon, chantor, rector, and treaſurer; but it has neither canons nor prebendaries. Cordova is ſituated between the river Primero, ſo called becauſe it is the firſt of five in the neighbourhood, which flow in the ſame direction, and a hill, on a level but ſandy ſoil, ſo that the rains ſpeedily paſs, though the vapours be unwholeſome. The city approaches a ſquare form; but the cathedral is irregular, from the want of ſymmetry in the towers. There are many good and ſtrong houſes in the city, but ſeldom high, though the roofs be elevated; and there are three convents, and two colleges, one of which the Franciſcans have abſurdly ſtyled the univerſity. Few places of equal extent can diſplay equal wealth; all the inhabitants, Spaniards as well as Creoles, being noted for activity and induſtry. The chief trade is in mules, which are brought from the ſouthern provinces; and having fed them in the fields, they conduct them to the fair of Salta, where they are ſold to merchants from Peru, at 8 or 10 dollars each; but ſome ſend them, on their own account, to be ſold in the Peruvian markets, the value being proportioned to the diſtance. The inhabitants may be 600; and the ſlaves, moſtly of different mixtures, do not procure their freedom ſo eaſily as in other parts of America. As meat is very cheap, and the ſlaves weave and make their own clothes, they are at once eaſily maintained, and very uſeful; nor do they wiſh for freedom, being neither fatigued nor oppreſſed. The female ſlaves are excellent waſher-women, and go into the river with the water above their middle; nor are they deficient in other kinds of induſtry. The ladies of Cordova are meanly clothed, and careful obſervers of the cuſtoms of their anceſtors; whence the ſlaves are not permitted to wear any cloth but that manufactured in the country. The wine, and a conſiderable part of the grain, are procured from Mendoza; while brandy is brought, in leathern bags or bottles, from S. Juan de la Frontera, 30 leagues to the N.W. of Mendoza, on the northern extremity of the province of Cuyo. N. lat. 31° 30′. W. long. 63° 15′.

CORDOVA, *Mountains of*, are a chain paſſing N. and S. on the W. of that province, regarded by ſome as a branch of the Andes, and ſaid to be covered with perpetual ſnow. Theſe mountains, according to Helms, ſometimes preſent red and green granite, and gneiſs, while the grand chain of the Andes conſiſts of argillaceous ſchiſtus. As the ridge of mountains becomes gradually higher, the population increaſes; but at Ramanſo, 60 miles from Cordova, they again branch, and ſo far from one another, that from that place to Tucuman the traveller paſſes through a ſaline plain, 70 Spaniſh miles in length, and for the moſt part barren and deſart, from which the mountains are ſeen at a diſtance. The whole ground is covered with a white incruſtation of ſalt; and bears no plants except the "ſalſola kali," which grows here to the height of four Pariſian yards. The decayed town of "St. Jago de Eſtero" is ſituated in this plain.

CORDOVA, a conſiderable town of North America, in Mexico, the chief article of its trade being ſugar, for which it has 33 mills. Eſtalla ſays, there are 260 families of Spaniards, 126 of Meſtizos, and 273 of Mexican Indians. Thiery deſcribes Cordova as a large town, with numerous domes, towers, and ſteeples, and a large ſquare in the centre, with Gothic arcades on three ſides, the cathedral filling the fourth; and a fountain of delicious water in the middle. The ſtreets are wide, ſtraight, and paved, and the houſes moſtly of ſtone; but the inhabitants are indolent. The ſituation is in a kind of natural paſſage towards the province of Mexico; the vegetation being rich and beautiful, on a ſoil of red clay, from 10 to 15 feet in depth, producing all the fruits of the two hemiſpheres. N. lat. 19° 15′. W. long. 97° 40′.

Cordova, *New*. See Cumana.

CORDOUAN, *the Tower of*, an extremely well-conſtructed pharos or light-houſe, at the mouth of the river Gironde, in France; 66 miles N.W. of Bourdeaux, and 15 miles S.W. of La Rochette; in N. lat. 45° 35′ 15″. It was rebuilt by Louis XIV. in the year 1665. The formidable maſs of rocks on which it ſtands is formed by the reefs that ſkirt the ſhore. The tower itſelf is 160 feet high, the great lanthorn 15; and from 200 to 350 pounds of pitcoal are conſumed in it every night. The watchmen are generally relieved every fortnight; they take care, however, to provide themſelves with at leaſt one month's proviſions, becauſe the boats cannot approach the rocks but when the ſea is perfectly calm. F. A. Fiſcher's Travels in Spain, Letter vi.

CORDUBA, Cavr. Francesco, in *Biography*, a painter and engraver of Italy, by whom we have a ſet of 44 etchings, middling ſized upright plates, from the fountains in the gardens about Rome, enlivened by figures much in the ſtyle of Callot. He marks his plates thus: "Eques Franc. Corduba del et Sculp." Strutt. Heinecken.

Corduba, in *Botany*, Cluſ. See Asparagus *albus* and *Aphyllus*.

Corduba, now *Cordova*, in *Ancient Geography*, a town of Spain, S.E of Mellaria, upon the river Bœtis. It was in this town, as Strabo informs us, that the Romans fixed their habitation, when they firſt entered Spain. But if it be true that it was founded by Marcellus, as Strabo himſelf ſays, we are led to imagine, that from the time when the Romans firſt inhabited it to the period when Marcellus conducted a colony hither, it could not have been very conſiderable. However, Silius Italicus ſays, that it ſubſiſted from the time of the ſecond Punic war. However this be, it was from the epoch of Marcellus that it bore the title of a patrician colony, from his having eſtabliſhed in it families of this order. Corduba was the firſt place which the Romans had in Spain, diſtinguiſhed by the appellation of *Conventus*, and with the privilege of coining money. It afterwards became ſo conſiderable, that Strabo compares it, with regard to its commerce, with Gades; and he alſo extols the extent and fertility of the adjacent country. It was no leſs celebrated for its literary reputation, as it was the reſidence of the two Senecas, and of the poet Lucan. On ſome medals, bearing the name of Corduba, we ſee on one ſide a well-dreſſed female head, and on the other a winged figure, holding a cornucopia; but the greateſt number of medals belonging to this city are inſcribed with "Colonia Patricia." It is probable that it was called by the firſt name before the eſtabliſhment of the colony, and afterwards by the other. See Cordova.

CORDUENA, a town of Armenia. See Gorduena.

CORDULA, or Cordyla, *Portus*, a port of Aſia in Pontus, upon the Euxine ſea, according to Arrian, who places it between mount *Sacer* and *Hermonaſſa*, S.E. of *Trapezus*.

CORDUS, or Sordus, the name given to an ancient people of Gallia Tarragonenſis, who dwelt in the vicinity of the Pyrenées, upon the coaſt of the Mediterranean ſea.

Cordus, Aulus Cremutius, in *Biography*, a ſenator and hiſtorian of Rome, during the reigns of its firſt two emperors. In his hiſtory of the civil wars, and of the reign of Auguſtus, he refers to C. Caſſius, and denominates him "the laſt of the Romans." For this offence he was impeached, and put on his trial; during which he manfully vindicated his cauſe, and in his defence exclaimed, "Poſterity will pay to every man his due honour, nor, if I am condemned, will there be wanting thoſe who will cheriſh the memory, not only of Brutus and Caſſius, but of me alſo." This was not the effuſion of an enthuſiaſt, but the confidence to which his virtue and talents gave him a juſt claim. His prediction has been abundantly fulfilled; and it affords us pleaſure, at the diſtance of nearly two thouſand years, to record the heroiſm of a man who diſdained to fear the arm of power, and who held in contempt the tyrant Sejanus, whoſe name has deſcended with as much infamy attached to it, as that of Cordus has with unſullied honour. Foreſeeing that he ſhould be condemned by the tribunal appointed to hear his cauſe, he reſolved to put an end to his life, by abſtaining from his daily food. On the fourth day, finding himſelf well nigh exhauſted by hunger and debility, he ſent for his beloved daughter, Marcia, from whom he had concealed his intention, and, embracing her with tender affection, apologized for keeping this only ſecret from her, adding, "I am now half-way on the road, and you neither ought to call me back, nor can do it." She departed; and while his accuſers and judges were debating what courſe to purſue, he breathed his laſt in peace. The ſenate ordered his books to be burnt; and though ſome copies were ſpared, which his daughter cauſed to be made as public as poſſible, yet nothing now remains except an eulogy of Cicero, preſerved in the Suaſoria of M. Seneca. Of their value an eſtimate may be formed by the character given of them by Seneca. Speaking to Marcia, he ſays, "You have well deſerved of Roman literature, and of poſterity, to whom will deſcend a faithful record of events, which coſt the author ſo dear: you have well deſerved of himſelf, whoſe memory will live and flouriſh, as long as it is thought worth while to know the hiſtory of Rome; as long as there ſhall remain any one, who ſhall wiſh to recur to the acts of his anceſtors, any one who ſhall be deſirous of knowing what a Roman once was; what, when all necks were bowed beneath the Sejanian yoke, was the character of an unconquerable ſpirit, free in his head, his heart, his hands." Rom. Hiſt.

Cordus, Euricius, by Melchior Adam called *Henry Urban*, celebrated for his ſkill in medicine and in poetry, was a native of Simmerſhuys in Heſſe. To aſſiſt himſelf in the proſecution of his ſtudies, he employed ſome of his early years in inſtructing the ſons of ſome of the neighbouring gentry. In performing this office, he had the good fortune to attract the notice of Eraſmus. In 1521 he went to Italy, where he attached himſelf in a particular manner to the ſtudy of botany; collecting and examining a number of rare plants, and diligently comparing them with the deſcriptions of them left by Dioſcorides. At Ferrara he took the degree of doctor in medicine, which he afterwards taught at Erfurt and Marpurg. In 1535 he went to Bremen, where he ſpent the ſmall remainder of his life, which terminated, when he was only of a middling age, in the year 1538. He was author of ſeveral, and ſome very valuable, works. His "Treatiſe on the Engliſh Sweating Sickneſs" was publiſhed at Fribourg, in 1529, 4to.; and in 1532, he gave a Latin verſion of the Theriaca, and Alexipharmica of Nicander. His "Botanologicon, ſive Colloquium de Herbis," was printed at Colonna, in 1534, which is commended by Haller, and was ſeveral times reprinted; and his "De Abuſu Uroſcopiæ," in 1546, at Frankfort. His Latin poems were publiſhed in the Deliciæ Poet. Germ. His ſon,

Cordus, Valerius, who followed in the ſteps of his father, and who acquired a ſtill greater portion of fame for his botanical reſearches, was born February 18th, 1515. The early part of his education he received under his father, who ſent him for further improvement to Wittenberg, and other German univerſities. Applying almoſt excluſively to the ſtudy of botany, he ranged over the neighbouring countries, in ſearch of plants, of which he made a conſiderable collection, many of them not before known or noticed. In 1542 he went to Italy, and viſited the univerſities of Padua, Piſa, Lucca, and Florence; every where converſing with the moſt eminent of the profeſſors. In his way to Rome, he had the misfortune to be wounded in his leg, by the kick of a horſe; but not thinking it dangerous, and continuing his excurſions, in ſearch of plants, the wound, by the time he arrived at Rome, was ſo much inflamed as to occaſion a fever, which put an end to his life in September, 1544, when he was only 29 years of age. He left ſeveral works, among them a "Hiſtory of Plants," many of them never before deſcribed. It was publiſhed by Conrad Geſner. Alſo, "Annotations on Dioſcorides;" "Diſpenſatorum Pharm. omnium quæ in uſu ſunt Noribergæ;" "De Spermate Ceti, vulgi dict." &c. Haller Bib. Botan. Eloy Dict. Hiſt. Gen. Biog.

CORDWAINERS, or Cordiners, the term whereby the ſtatutes denominate *ſhoe-makers*.

The word is formed from the French *cordonnier*, which Menage derives from *cordouan*, a kind of leather brought from *Cordoua*, whereof they formerly made the upper-leathers of their ſhoes. Others derive it from *corde, rope*, becauſe anciently ſhoes were made of cords; as they ſtill are in ſome parts of Spain, under the name of *alpargates*. But the former etymology is better warranted: for, in effect, the French workmen, who prepared the *cordouas*, are ſtill called *cordouanniers*.

In Paris they have two pious ſocieties, under the titles of *Freres Cordonniers*, *Brothers Shoemakers*, eſtabliſhed by authority towards the middle of the ſeventeenth century; the one under the protection of St. Criſpin, the other of St. Criſpianus, two ſaints who had formerly honoured the profeſſion. They live in community, and under fixed ſtatutes and officers; by which they are directed both in their ſpiritual and ſecular concerns. The produce of their ſhoes goes into a common ſtock, to furniſh neceſſaries for their ſupport; the reſt to be diſtributed among the poor.

By ſtat. 1. Jac. I. c. 22. the maſters and wardens of the cordwainers company in London are to appoint ſearchers and triers of leather; and leather is not to be ſold before it is ſearched and ſealed. See Company.

CORDYLA, in *Botany*, Lour. Cochinch. Boſc. Dict. Hiſt. Nat. claſs and order, *monadelphia decandria.*

Gen. Ch. *Cal.* campanulate, with four acute diviſions. *Cor.* none. *Stam.* Filaments twenty-four, united at the baſe. *Piſt.* Germ ſuperior; ſtyle one; ſtigmas ſimple. *Peric.* Berry pedicelled, oval, acute, one-celled. *Seeds* ſix, oval.

Sp. C. *parvifolia.* A large tree. *Leaves* ſmall, oblong, emarginate, ſmooth. *Flowers* in ſmall, lateral, ſolitary tufts. A native of the eaſtern coaſts of Africa.

Cordyla, in *Ichthyology*, an American fiſh, the *Scomber cordyla* of Gmelin, the *Guara-tereba* of Marcgraave, and the *Trachurus braſilienſis* of Ray.

CORDYLINE, in *Botany*, Roy. See Dracæna *draco*, and Yucca *glorioſa et draconis.*

CORDYLOCARPUS, (from κορδυλη, *a club*, and καρπος, *fruit*, alluding to the form of the ſilique.) Willd. 1248. Desfont. (Sinapi; Encyc.) Claſs and order, *tetradynamia ſiliquoſa.* Nat. Ord. *Siliquoſæ*, Linn. *Cruciferæ*, Juſſ.

Gen. Ch. *Cal.* four-leaved, caducous; leaves linear, nearly cloſe. *Cor.* four-petalled, cruciform, open; claws the length of the calyx; border oval, quite entire. *Stam.* Filaments ſix, erect, filiform; two lateral ones ſhorter; anthers almoſt erect, ſmall, oval. *Piſt.* Germ ſuperior, cylindrical, ſwollen at the upper end; ſtyle very ſhort; ſtigma obtuſe. *Peric.* Silique jointed; the laſt joint diſtant, globular, ſwollen, terminated by the permanent ſtyle. *Seeds* ſeveral, convex, ſomewhat compreſſed, oblong.

Eſſ. Ch. Calyx nearly cloſe. Silique cylindrical, jointed; the laſt joint more diſtinctly ſeparated.

Sp. 1. C. *muricatus.* Poiret in Encyc. 1. Willd. 1. Desf. Atl. 2. 72. tab. 152. "Siliques one-celled, ſpreading; laſt joint muricate; leaves partly lyrate." *Root* annual. *Stems* about two feet high, erect, ſcabrous, hiſpid, eſpecially on the lower part, ſlightly ſtriated, branched; branches alternate, axillary. *Leaves* ſmooth, or clothed with a few diſtant hairs; lower ones oblong, or elliptical, decurrent; ſome quite entire, others lyrate; upper ones lanceolate, alternate, ſlightly ſinuated, or a little toothed. *Flowers* alternate, almoſt ſeſſile, in a terminal raceme; calyx ſmooth, or ſomewhat villous, coloured; corolla pale yellow. *Siliques* ſmooth, or a little villous. *Seeds* four or five. Diſcovered by Desfontaines about Mayane, in the kingdom of Algiers. 2. C. *lævigatus.* Willd. 2. Poir. 2. (Sinapi græcum; Tourn. Cor. 17. It. 1. 398. tab. 35. Erucaria aleppica; Gært. 298. tab. 143. fig. 9. Vent. Jard. de Cels. tab. 64.) "Siliques two-celled, preſſed; terminal joint ſmooth; leaves pinnatifid." *Stem* a foot high, erect, quite ſmooth; branches alternate, widely ſpreading. *Leaves* ſomewhat fleſhy, alternate, ſmooth, petioled; ſegments linear, entire, channelled. *Flowers* in terminal upright racemes; corolla purple, or pale red. A native of the iſlands of the Archipelago.

CORDYLUS, in *Ancient Geography*, a town of Aſia, placed by Steph. Byz. in Pamphylia.

Cordylus, in *Zoology*, a ſpecies of lizard, the Lacerta *cordylus* of Gmelin and Linnæus, with a ſhort verticillated tail, denticulated ſcales, and a ſmooth body. It is found in Aſia and Africa. Its body is livid or blackiſh.

CORE, in *Rural Economy*, a name applied to a diſorder incident to ſheep, occaſioned by the preſence of ſmall flat worms ſituated in the liver. The greateſt chance of removing this complaint is by changing the ſheep into a more airy and dry paſture.—It alſo ſignifies the heart of the wood of trees, and likewiſe of ſome ſorts of fruit, as the apple, pear, &c.

Core *Bank*, in *Geography*, a narrow iſland of America, on the coaſt of N. Carolina, about 40 miles long, and ſcarcely 2 broad. N. lat. 34° 22′ to 34° 55′. W. long. 76° 26′ to 76° 50′.

Core *Sound* lies on the coaſt of N. Carolina, ſouth of, and communicating with, Pamlico.

COREA, or Coreæ, in *Ancient Geography*, a place at which Paleſtine commenced on the northern ſide, according to Joſephus; who ſays it was near Scythiopolis and a fortreſs named Alexandrium.

Corea, in *Geography*, called by the Chineſe *Kao-li*, and by the Mantchew Tartars *Sol-ho*, a kingdom of Aſia, in the form of a peninſula, extended between China and Japan, and every where ſurrounded by the ſea, except towards the north, where it is connected with Chineſe Tartary, which bounds it on the north; it is bounded on the eaſt by the ſea and iſles of Japan; on the ſouth by the ſtraits of Corea, ſeparating it from Japan, and by the ocean; and on the weſt by the Yellow ſea, which parts it from China. This kingdom is commonly reckoned to be 200 leagues in length from N. to S. and 100 in breadth from E. to W. The great number of ſhoals and ſand-banks which ſurround the coaſts of this peninſula, render acceſs to it by ſea equally dangerous and difficult. Its leaſt diſtance from Japan is only 25 leagues. The origin of the Coreans is very obſcure. It appears, however, that this peninſula was at firſt inhabited by different tribes, which compoſed ſeveral ſtates; and that, in proceſs of time, they united under the ſame government, and formed one kingdom, which was called *Kao-li*. The Coreans were moſt probably of Tartarian extraction. This kingdom is governed by a ſovereign, who exerciſes abſolute authority over his ſubjects, although he himſelf is a vaſſal and tributary of the emperor of China. On every ſucceſſion to the crown, the prince receives on his knees the inveſtiture of his ſtates, granted, or at leaſt, confirmed by the emperor, and diſtributes among the emperor's envoys the ſum of 800 taëls, and ſeveral other cuſtomary preſents. The miniſter of Corea afterwards repairs to Pe-king, to proſtrate himſelf before the emperor, and preſent him the tribute. The princeſs, who has eſpouſed the king, cannot aſſume the title of queen, until ſhe has received it from the court of Pe-king.

The Japaneſe conquered this kingdom about the end of the 16th century; but the Coreans, aſſiſted by the Tartars, who had ſubdued China, drove them from their country. The Mantchews, thus maſters of Corea, endeavoured to compel their new ſubjects to ſhave their heads, after their manner, and to adopt the Tartar dreſs. This innovation irritated their minds, and occaſioned a general revolt throughout the kingdom of Corea, which was at length appeaſed by the prudent attention of the reigning family. The interior geography of this kingdom is little known: we are informed, however, that it is divided into eight provinces, containing 40 diſtricts, 33 cities of the firſt claſs, 58 of the ſecond, and 70 of the third. King-kitan, or Kinka-tao, ſituated in the province of King-hi, is the capital of the whole kingdom, and the ordinary reſidence of the ſovereign. This prince is abſolute maſter of all the wealth of his ſubjects, which he inherits after their death. He is very rigid in the adminiſtration of juſtice; and particular puniſhments are appointed for murder, robbery, and adultery. Every ſeventh year all the freemen of the different provinces are obliged to go to court in rotation, and to keep guard round his perſon for two months; ſo that, during this year, the whole country is in motion and under arms.

The Coreans are well-formed, ingenious, brave, and tractable. They are fond of dancing and muſic, and peculiarly docile in acquiring the ſciences, which they are ſaid to ſtudy with ardour. Men of learning are diſtinguiſhed from other claſſes of people by two plumes of feathers, which they wear in their caps. When merchants preſent any books for ſale to the Coreans, they ſhew their reſpect by dreſſing in the richeſt attire, and burn perfumes before they treat concerning the price. The northern Coreans are of a larger ſize, and more robuſt than thoſe of the ſouth; they are addicted to arms and become excellent ſoldiers; uſing, in combat, croſs-bows and very long ſabres. The Coreans do not inter their dead till three years after their deceaſe; they wear mourning for a father or mother three years, and for a brother three months. When they perform the ceremony of interment, they place around the tomb the clothes, chariot, and horſes of the deceaſed, and any thing elſe of which he was fond when alive; all which they leave to be carried away by thoſe who aſſiſted at the funeral. Their houſes conſiſt only of one ſtory, and are very ill built; in the country, they are of earth, in cities, generally of brick; but they are all thatched with ſtraw. The walls of their cities are conſtructed after the Chineſe manner, with ſquare turrets, battlements, and arched gates. Theſe people have borrowed their writing, dreſs, religious worſhip, ceremonies, belief of the tranſmigration of ſouls, and the greater part of their cuſtoms, from the Chineſe. Their language, however, is different. (See China.) Their women are ſubject to leſs reſtrictions than thoſe of China; and they alſo differ from the Chineſe with regard to their marriage ceremonies. In China, fathers and mothers often marry their children without their conſent and even without their knowledge; but in Corea, the contracting parties chooſe for themſelves, nor do they conſult the inclinations of their parents, or allow them to interpoſe any obſtacles in the way of their union. The principal productions of Corea are wheat, rice, and ginſeng. This country alſo produces gold, ſilver, iron, foſſil ſalt, caſtor and ſable's ſkins, a beautiful yellow varniſh, the ſplendour of which is almoſt equal to gilding, and which diſtils from a tree reſembling the palm tree, ſmall horſes about three feet high, and white paper. Small bruſhes for painting are made here of the hair of a wolf's tail, which are much eſteemed in China. The paper of Corea, of which a conſiderable quantity is annually imported into China, is made of cotton; it is as ſtrong as cloth, and thoſe who write upon it make uſe of a ſmall hair bruſh or pencil: without the precaution of rubbing it over gently with a little alum-water, it would not bear the ink of European pens. With this paper the Coreans partly pay the tribute due to the emperor, ſupplying the palace with it every year. The Chineſe purchaſe it, not for the purpoſe of writing, but for filling up the ſquares of their ſaſh-windows, becauſe, when oiled, it reſiſts the wind and rain much better than theirs; they alſo uſe it as wrapping-paper; and it is likewiſe ſerviceable to their tailors, who rub it between their hands till it becomes as ſoft and flexible as the fineſt cotton cloth, inſtead of which they often employ it in lining clothes. If it be too thick for the purpoſe intended, it may be eaſily ſplit into two or three leaves; and theſe leaves are even ſtronger, and leſs liable to be broken, than the beſt paper of China.

The ſea-coaſts of Corea abound with fiſh; many whales are found there every year towards the north-eaſt, ſeveral of which, it is ſaid, bear in their bodies the darts and harpoons of the French and Dutch, from whom they have eſcaped in the northern extremities of Europe. If this be true, it ſeems to indicate the exiſtence of a paſſage from thence into the ſeas that lead to the north of America. We refer the reader for farther information with regard to this country to Du Halde and Groſier.

Corea, *Strait of*, that part of the ſea which ſeparates the ſouthern part of the continent of Corea from the Japan iſlands, between N. lat. 34° and 36°, and E. long. 130° and 132° 30′. The channel, ſays Perouſe (Voyage, vol. ii. p. 17, Eng. ed.), that ſeparates the coaſt of Japan from the continent may be 15 leagues wide, but it is reduced to 10 leagues by rocks which uninterruptedly border the ſouthern coaſts of Corea, from Quelpaert, and which continued, till we had doubled the S.E. point of that peninſula, ſo that we were able to keep very cloſe to the continent, diſtinguiſh the houſes and towns on the coaſt, and reconnoitre the bays. We ſaw, ſays Perouſe, on the ſummits of the mountains ſome fortifications exactly ſimilar to European forts. It is highly probable the principal means of defence, employed by the Coreans, are directed againſt the Japaneſe. This part of the coaſt is very favourable to navigation, for there appears no cauſe of danger; and at 3 leagues in the offing the depth of water is 60 fathoms over a muddy bottom; but the country is mountainous, and appears very arid. The ſnow was not entirely melted in ſome hollows (May, 1787); and the ſoil ſeemed but little ſuſceptible of cultivation. The habitations, however, are very numerous. We counted a dozen ſampanes, or junks, ſailing along the coaſt, and ſeeming in no reſpect to differ from thoſe in China, their ſails being alſo made of matting. See DAGELET, *Iſland of.*

COREATIS, in *Ancient Geography*, a place of India, near the mouths of the Indus, according to Arrian.

CORED, in *Geography*, a town of Egypt; 16 miles N.E. of Belbeis.

CORED *Herrings*. See HERRINGS.

COREGGIO, in *Biography*. See CORREGGIO.

COREGLIO, in *Geography*, a town of Italy, in the ſtate of Lucca; 15 miles N. of Lucca.

COREGONI, in *Ichthyology*, a diviſion of the SALMO, including thoſe with ſcarcely conſpicuous teeth.

COREIA, in *Antiquity*, a feſtival in honour of Proſerpine, named *Core*, Κορη, which, in the Moloſſian dialect, ſignifies a beautiful woman.

CORELLA, in *Geography*, a town of Spain, in Navarre, on the Alhama; 6 leagues from Tudella.

CORELLI, ARCANGELO, in *Biography*. The performance and compoſitions of this admirable muſician, form an æra in inſtrumental muſic, particularly for the VIOLIN, and its kindred inſtruments, the *tenor* and *violoncello*, which he made reſpectable, and fixed their uſe and reputation, in all probability, as long as the preſent ſyſtem of muſic ſhall continue to delight the ears of mankind. Indeed, this moſt excellent maſter had the happineſs of enjoying part of his fame during mortality; for ſcarce a contemporary muſical writer, hiſtorian, or poet, neglected to celebrate his genius and talents; and his productions have contributed longer to charm the lovers of muſic by the mere powers of the bow, without the aſſiſtance of the human voice, than thoſe of any compoſer that has yet exiſted. Haydn, indeed, with more varied abilities, and a much more creative genius, when inſtruments of all kinds are better underſtood, has captivated the muſical world in, perhaps, a ſtill higher degree; but whether the duration of his favour will be equal to that of Corelli, who reigned ſupreme in all concerts, and excited undiminiſhed rapture full half a century, muſt be left to the determination of time, and the encreaſed rage of depraved appetites for novelty.

Corelli was born at Fuſignano, near Imola, in the territory of Bologna, in February 1653. He is ſaid by Adami to have received his firſt inſtructions in counterpoint from Matteo Simonelli of the Papal chapel; but the general opinion is, that his maſter on the violin was Giambatiſta Baſſani, of Bologna. It has been ſaid (Life of Handel, 1760, p 46.) without authority, that Corelli went to Paris in the year 1672, but was ſoon driven thence by the jealouſy and violence of Lulli. That he viſited Germany after he had finiſhed his ſtudies, we are aſſured by Gaſpar Printz (Satyr. Tomponiſt, 3ten. Theil. p. 227.) who informs us, that he was in the ſervice of the duke of Bavaria, in 1680. Soon after this period, he ſeems to have returned to Italy, and ſettled at Rome, where, about 1683, he publiſhed his firſt “Twelve Sonatas.” In 1685, the ſecond ſet appeared, under the title of “Balletti da Camera,” which, the ſame year, gave riſe to a controverſy between the author and Paolo Colonna, concerning the diatonic ſucceſſion of fifths, between the firſt treble and the baſe of the allemand in the ſecond ſonata. In 1690, Corelli publiſhed the third opera of his ſonatas; and in 1694, the fourth, which, conſiſting of movements fit for dancing, like the ſecond, he called “Balletti da Camera.”

In the works of the poet Guidi, publiſhed at Verona, 1726, it is recorded that, in 1686, when our king James II. piouſly ſent an ambaſſador to pope Innocent XI. to make a tender of his duty as a faithful ſon of the Romiſh church, at a grand academia which Chriſtina queen of Sweden, then a proſelyte, and reſident in the Alma Citta di Roma, gave on the occaſion, the muſic was compoſed by Bernardo Paſquini, and the band, amounting to one hundred and fifty performers on bowed-inſtruments, *inſtrumenti d' arco*, led by Arcangelo Corelli.

About this time, when the opera was in a very flouriſhing ſtate at Rome, Corelli led the band as principal violin.

But his ſolos, the work by which he acquired the greateſt reputation during his life time, did not appear till the year 1700, when they were publiſhed at Rome, under the following title: “Sonate à Violino, e Violone, ò Cembalo, Opera quinta, Parte prima, Parte ſeconda, Preludii, Allemande, Corrente, Gighe, Sarabande, Gavotte e Follia.” This work was dedicated to Sophia Charlotta, electreſs of Brandenburgh. His great patron at Rome was cardinal Ottoboni, the general encourager of polite arts and learning, to whom, in 1694, he dedicates his “Opera Quinta,” and in whoſe palace he conſtantly reſided, *col ſpetioſa carattere d' attuale ſervitore* of his eminence, as he expreſſes himſelf in the dedication.

Creſcimbeni (Comment. della Volg. Poeſia, vol. i. chap. xi. Roma 1702.) ſpeaking of the ſplendid and majeſtic *academia*, or concert, held at cardinal Ottoboni's every Monday evening, ſays, that this performance was regulated by Arcangelo Corelli, that moſt eminent profeſſor of the violin: *famoſiſſimo profeſſore di violino.*

In 1708, we have an honourable teſtimony of his high rank in the profeſſion, given at Venice in the firſt edition of the “Armonico prattico al Cembalo,” by Franceſco Gaſparini, who calls him, “virtuoſiſſimo di violino, e vero Orfeo di noſtro tempo,” (cap. vii.) And Adami, in ſpeaking of Simonelli, Correlli's firſt maſter in counterpoint, ſays, that he made many ſcholars, “among whom, the moſt celebrated was the famous Corelli, the chief glory of the age, with the fame of whoſe five works, already publiſhed, the world is filled; and the ſixth, conſiſting of concertos, which he is now (1711) poliſhing for the preſs, will complete his immortality.”

A very particular and intelligent friend, upon whoſe judgment and probity we have a moſt perfect reliance, having had a converſation with Geminiani about five or ſix years before his death, and a friend of his at that time having had in meditation the writing a hiſtory of muſic, he committed to paper, when he got home, the chief particulars of his converſation, ſuppoſing they might be of ſome uſe to his friend; but as the plan he had in view has been long laid aſide, we have been favoured with the anecdotes and particulars that were obtained from Geminiani, which, as they chiefly concern Corelli, and were communicated by one of his moſt illuſtrious ſcholars, who heard and ſaw what he relates; we ſhall inſert them here.

“At the time that Corelli enjoyed the higheſt reputation, his fame having reached the court of Naples, and excited a deſire in the king to hear him perform; he was invited, by order of his majeſty, to that capital. Corelli, with ſome reluctance, was at length prevailed on to accept the invitation; but, leſt he ſhould not be well accompanied, he took with him his own ſecond violin and violoncello. At Naples he found Aleſſandro Scarlatti, and ſeveral other maſters, who entreated him to play ſome of his concertos before the king; this he for ſome time declined, on account of his whole band not being with him, and there was no time, he ſaid, for a rehearſal. At length, however, he conſented; and in great fear performed the firſt of his concertos. His aſtoniſhment was very great to find that the Neapolitan band executed his concertos almoſt as accurately at ſight, as his own band, after repeated rehearſals, when they had almoſt got them by heart. *Si ſuona*, (ſays he to Matteo, his ſecond violin) *à Napoli!*

“ After this, being again admitted into his majeſty's preſence, and deſired to perform one of his ſonatas, the king found one of the adagios ſo long and dry, that being tired, he quitted the room, to the great mortification of Corelli. Afterwards, he was deſired to lead in the performance of a maſque compoſed by Scarlatti, which was to be executed before the king; this he undertook, but from Scarlatti's little knowledge of the violin, the part was ſomewhat awkward and difficult: in one place it went up to F; and when they came to that paſſage, Corelli failed, and was unable to execute it; but he was aſtoniſhed beyond meaſure to hear Petrillo, the Neapolitan leader, and the other violins, perform that which had baffled his ſkill. A ſong ſucceeded this in C minor, which Corelli led off in C major; *ricomminciamo*, ſaid Scarlatti, good-naturedly. Still Corelli perſiſted in the major key, till Scarlatti was obliged to call out to him, and ſet him right. So mortified was poor Corelli with this diſgrace, and the general bad figure he imagined he had made at Naples, that he ſtole back to Rome in ſilence.

“ It was ſoon after this, that a hautbois player, whoſe name Geminiani could not recollect, acquired ſuch applauſe at Rome, that Corelli, diſguſted, would never play again in public. All theſe mortifications, joined to the ſucceſs of Valentini, whoſe concertos and performance, though infinitely inferior to thoſe of Corelli, were become faſhionable, threw him into ſuch a ſtate of melancholy and chagrin, as was thought, ſaid Geminiani, to have haſtened his death.”

This account of Corelli's journey to Naples is not a mere perſonal anecdote, as it throws a light upon the comparative ſtate of muſic at Naples and at Rome, in Corelli's time, and exhibits a curious contraſt between the fiery genius of the Neapolitans, and the meek, timid, and gentle character of Corelli, ſo analagous to the ſtyle of his muſic.

In 1712, his concertos were publiſhed in a beautiful edition, engraved at Amſterdam, by Eſtienne Roger and Michael Charles le Cene, and dedicated to John William, prince palatine of the Rhine; but, alas! the author ſurvived the publication of this admirable work but ſix weeks; the dedication bearing date at Rome, the 3d day of December 1712, and he died on the 18th of January 1713!

He was buried in the church of the Rotunda or Pantheon, in the firſt chapel on the left hand of the entrance of that beautiful temple, where a monument, with a marble buſt on it, was erected to his memory, near that of the great painter Raphael, by Philip William, count palatine of the Rhine, under the care of Cardinal Ottoboni; on which is the following inſcription:

D. O. M.
Archangello Corellio a Fuſignano
Philippi Willelmi Comitis Palatini Rheni
S. R. I. Principis ac Electoris
Beneficentia
Marchioni de Ladenſburg
quod eximiis Animi Dotibus
et Incomparabili in Muſicis modulis peritia
ſummis Pontificibus apprime carus
Italiæ atque exteris Nationibus Admirationi fuerit
indulgente Clemente XI P. O. M.
Petrus Cardinalis Ottobonus S. R. E. Vic. Cam.
et Galliarum Protector
Lyriſti Celeberrimo
inter Familiares ſuos jam diu adſcito
ejus Nomen Immortalitati commendaturus
M. P. C.
Vixit Annos LIX. Mens X. Dies XX.
Obiit. IV. Id. Januarii Anno Sal. MDCCXIII.

During many years after his deceaſe, there was a kind of commemoration of this admirable muſician in the Pantheon, by a ſolemn ſervice, conſiſting of pieces ſelected from his own works, and performed by a numerous band, on the anniverſary of his funeral. A ſolemnity which continued as long as his immediate ſcholars ſurvived, to conduct and perform in it. The late Mr. Wiſeman, who arrived at Rome before the diſcontinuance of this laudable cuſtom, aſſured us that his works uſed to be performed, on this occaſion, in a ſlow, firm, and diſtinct manner, juſt as they were written, without changing the paſſages in the way of embelliſhment. And this, it is probable, was the way in which Corelli himſelf uſed to play them.

Of the private life and moral character of this compoſer, little new information can now be acquired or expected; but if we may judge of his equanimity and natural diſpoſition by the mildneſs, ſweetneſs, and even tenor of his muſical ideas, his temper muſt have endeared him to all his acquaintance, as much as his talents.

Indeed, the account that is given of his dying worth 6000*l.* beſides a valuable collection of pictures, and bequeathing them all to his patron Cardinal Ottoboni, does more honour to his parſimony and gratitude, than judgment; a muſician leaving money to a cardinal, while he had a relation or neceſſitous friend in the world, ſeems to favour more of vanity, than true generoſity. And the cardinal, himſelf, manifeſted his opinion of this bequeſt, by keeping only the pictures, and diſtributing the reſt of Corelli's effects among his poor relations, to whom they naturally appertained.

To attempt to give a character here of Corelli's compoſitions, which have been ſo long heard and univerſally admired, may to many of our readers appear wholly uſeleſs; yet as they are thrown aſide as antiquated lumber by ſome, and regarded as models of perfection by others, our wiſh to rank each muſician in his true place, with equity and fairneſs, inclines us to make a few reflexions on the genius and works of this maſter, before we quit the ſubject.

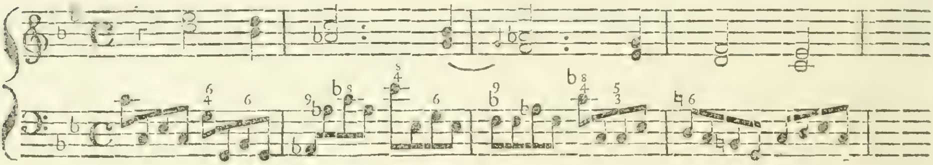
As Corelli originally ſtiled the ſecond and fourth opera of his ſonatas, “ *Balletti da Camera*,” from the dancing and familiar movements contained in them; the firſt and third ſet, from their gravity of ſtyle and movement, may be called “ Sonate da Chieſa.” The ſame diſtinction may be made with propriety in his concertos, and even ſolos; the firſt eight of the former, and ſix of the latter, being much more ſolemn and eccleſiaſtical than the reſt.

With regard to the intrinſic worth of his four books of ſonatas at preſent, notwithſtanding the exquiſite pleaſure they may have afforded ourſelves and others, during youth, it is very much diminiſhed by the general improvement of melody, knowledge of the bow, and boldneſs of modulation, which have freed invention from former ſhackles, and generated new ideas and effects. Indeed, during the time of Corelli, and long after, every one who knew the mechanical laws of harmony, however ignorant of the violin, ſet about compoſing ſonatas, ſolos, and concertos, for it; but the great maſters of that inſtrument, whoſe genius and invention have kept pace with their hand, have now nearly cruſhed all ſuch inſipid and impotent attempts.

Corelli's ſolos, as a claſſical book for forming the hand of a young practitioner on the violin, has ever been regarded as a moſt uſeful and valuable work, by the greateſt maſters of that inſtrument. We were told by Mr Wiſeman at Rome, that when he firſt arrived in that city, about twenty years after Corelli's deceaſe, he was informed by ſeveral perſons who had been acquainted with him, that his "Opera Quinta," on which all good ſchools for the violin have been ſince founded, coſt him three years to reviſe and correct. Tartini formed all his ſcholars on theſe ſolos; and Signor Giardini has told us, that of any two pupils of equal age and diſpoſition, if the one was to begin his ſtudies by Corelli, and the other by Geminiani, or any other eminent maſter whatever, he is ſure that the firſt would become the beſt performer.

The concertos of Corelli ſeem to have withſtood all the attacks of time and faſhion with more firmneſs than any of his other works. The harmony is ſo pure, ſo rich, and ſo grateful; the parts are ſo clearly, judiciouſly, and ingeniouſly diſpoſed; and the effect of the whole, from a large band, ſo majeſtic, ſolemn, and ſublime, that they preclude all criticiſm, and make us forget that there is any other muſic of the ſame kind exiſting.

Geminiani, according to our friend's memorandums, whence an extract has already been given, aſſerted that "Corelli availed himſelf much of the compoſitions of other maſters, particularly of the maſſes in which he played at Rome; that he acquired much from Lulli, particularly the method of modulating in the legatura, and from Bononcini's famous Camilla." This was not very intelligible: nor does the charge appear well founded; as Lulli has made but little uſe of the *legatura*. With theſe maſſes we are unacquainted; but we find frequent imitations of the more natural paſſages of Scarlatti, particularly in the beautiful adagio of his eighth concerto, in which there is a great reſemblance to a movement in a cantata which was ſet by Scarlatti in 1704, eight years prior to the publication of Corelli's concertos.



Geminiani's character of Corelli, upon the whole, however, ſeems very juſt; he ſaid, that "his merit was not depth of learning, like that of Aleſſandro Scarlatti; nor great fancy, or rich invention in melody or harmony; but a nice ear and moſt delicate taſte, which led him to ſelect the moſt pleaſing harmonies and melodies, and to contract the parts ſo as to produce the moſt delightful effect upon the ear." At the time of Corelli's greateſt reputation, Geminiani aſked Scarlatti what he thought of him, who anſwered, that "he found nothing greatly to admire in his compoſition, but was extremely ſtruck with the manner in which he played his concertos, and his nice management of his band, the uncommon accuracy of whoſe performance gave the concertos an amazing effect even to the eye as well as the ear:" for, continued Geminiani, "Corelli regarded it as eſſential to the *enſemble* of a band, that their bows ſhould all move exactly together, all up, or all down; ſo that at his rehearſals, which conſtantly preceded every public performance of his concertos, he would immediately ſtop the band if he diſcovered one irregular bow."

There ſeems ſome juſtice in Geminiani's opinion, that Corelli's continual recourſe to certain favourite paſſages betrays a want of *reſource*. They were ſo many *bar reſts* for his invention. All the varieties of Corelli's harmony, modulation, and melody, might perhaps be compriſed in a narrow compaſs. The muſical index to his works would not be long.

Indeed Corelli was not the inventor of his own favourite ſtyle, though it was greatly poliſhed and perfected by him. Torelli's concertos, though poſthumous, were publiſhed three years before thoſe of Corelli; and we know not how long they had been compoſed, or how often performed, previous to publication.

For a model of his graver ſonatas in the firſt and third ſet, he certainly had thoſe of Baſſani in his mind; and for the lighter ſort, he had many models. His ſolos ſeem drawn from his own ſource more entirely than any of his other productions.

There was little or no melody in inſtrumental muſic before Corelli's time. And though he has much more grace and elegance in his *cantilena* than his predeceſſors, and ſlow and ſolemn movements abound in his works; yet true pathetic and impaſſioned melody and modulation ſeem wanting in them all. He appears to have been gifted with no uncommon powers of execution; yet, with all his purity and ſimplicity, he condeſcended to aim at difficulty, and manifeſtly did all he could in rapidity of finger and bow, in the long unmeaning allegros of his firſt, third, and ſixth ſolos; where, for two whole pages together, common chords are broken into common diviſions, all of one kind and colour, which nothing but the playing with great velocity and neatneſs could ever render tolerable. But like ſome characters and indecorous ſcenes in our beſt old plays, theſe have been long omitted in performance.

Indeed his knowledge of the power of the bow, in varying the expreſſion of the ſame notes, was very much limited. Veracini and Tartini greatly extended theſe powers; and we well remember our pleaſure and aſtoniſhment in hearing Giardini, in a ſolo that he performed at the oratorio, 1769, play an air at the end of it with variations, in which, by repeating each ſtrain with different bowing, without changing a ſingle note in the melody, he gave it all the effect and novelty of a new variation of the paſſages.

However, if we recollect that ſome of Corelli's works are now more than a hundred years old, we ſhall wonder at their grace and elegance; which can only be accounted for on the principle of eaſe and ſimplicity. Purcell, who compoſed for ignorant and clumſy performers, was obliged to write down all the faſhionable graces and embelliſhments of the times, on which account his muſic ſoon became obſolete and old faſhioned; whereas the plainneſs and ſimplicity of Corelli have given longevity to his works, which can always be moderniſed by a judicious performer, with very few changes or embelliſhments. And, indeed, Corelli's productions continued longer in unfading favour in England than in his own country, or in any other part of Europe; and have ſince only given way to the more fanciful compoſitions of the two Martini's, Zaneſti, Campioni, Giardini, Bach, Abel, Schwindl, Boccherini, Stamitz, Haydn, Mozart, and Pleyel.

After the publication of Corelli's works, the violin ſeems to have increaſed in favour all over Europe.

CORENDELIN, in *Geography*, a town of Swiſſerland, in the canton of Soleure; 10 miles N. of Soleure.

CORENTIN, a conſiderable river of South America, in Dutch Guiana.

COREOPSIS, in *Botany*, (from κορις, a *bug*, and οψις, *appearance*, alluding to a fancied reſemblance between the ſeed and the inſect.) Linn. gen. 981. Schreb. 1325. Willd. 1538. Gært. 1037. Juſſ. 188. Vent. 2. 528. (Coriope; Enc.) Claſs and order, *ſyngeneſia polygamia fruſtranea.* Nat. Ord. *Compoſitæ oppoſitifoliæ*, Linn. *Corymbiferæ*, Juſſ.

Gen. Ch. *Cal.* many-leaved, generally double, ſometimes ſimple, and ſomewhat imbricated. *Cor.* compound; florets of the diſk numerous, hermaphrodite, fertile, tubular, five-toothed; florets of the ray female, abortive, ligulate, ſpreading, large. *Stam.* Filaments five, capillary, very ſhort. *Piſt.* Germ compreſſed; ſtyle filiform; ſtigma bifid. *Recep.* generally chaffy. *Seeds* ſolitary, compreſſed, crowned with a two or three-horned border.

This genus differs from bidens in having a ray, and from verbeſina in having the florets of the ray barren.

Sp. 1. C. *ferulæfolia.* Willd. 1. Jacq. Hort. Schœn. 3. 65. tab. 373. "Leaves bipinnated; pinnulæ linear-lanceolate, with ribs half their breadth." *Root* perennial; outer-leaves of the *calyx* numerous, reflexed. A native of Mexico. 2. C. *verticillata.* Linn. Sp. Pl. 1. Mart. 1. Willd. 2. Bot. Mag. 156. (C. foliis verticillatis; Gron. Virg. 131. Chryſanthemum; Pluk. Mant. 48. tab. 344. fig. 4.) "Leaves decompound-pinnated; ſegments filiform." *Root* biennial. *Stem* from a foot and half to three feet high, erect, ſtriated. *Leaves* ſeſſile, oppoſite, but often appearing to grow in whorls in conſequence of being cut to the baſe into linear ſegments, which are curved in various directions. *Flowers* terminal; florets of the diſk brown; of the ray yellow; calyx ſhort; outer leaves narrow, looſe, ſhorter than the others. A native of Virginia and Louiſiana. 3. C. *delphinifolia.* Lam. 2. (Ceratophyllus Delphinii foliis; Vaill. act. 1720. Ehret. pict. tab. 9. fig. 1.) "Leaves tripartite-pinnated; ſegments linear, channelled on the upper ſurface." Nearly allied to the preceding, but conſtantly diſtinguiſhed from it by its foliage and habit. *Root* perennial. *Stem* a foot and half high, erect, ſmooth, ſtriated. *Leaves* oppoſite, connate, ſeſſile, divided at the baſe into three pinnated ſegments. *Flowers* terminal; florets of the diſk brown, on a ſomewhat prominent receptacle; of the ray yellow, acute, entire, or bifid; outer ſcales of the calyx narrow, looſe, obtuſe. A native of Virginia. It may perhaps be doubted which of the laſt two is the verticillata of Linnæus. 4. C. *tenuifolia.* Willd. 3. Ehrt. Beitr. 7. 168. "Leaves three or five in a whorl, pinnated; pinnæ linear, three-parted or undivided; diſk the ſame colour with the ray." *Root* perennial. A native of Carolina. Willdenow ſuppoſes this ſpecies to be the verticillata of La Marck; but he cannot be right, if it have the diſk and ray of the ſame colour; for La Marck, who deſcribed from a living plant, expreſsly ſays, that the diſk of his verticillata is brown, and its ray yellow. It is on this circumſtance alone, that the ſeparate exiſtence of tenuifolia ſeems to depend. 5. C. *coronata.* Linn. Sp. Pl. 2. Mart. 2. Willd. 4. (Ceratophyllus foliis pentapteris; Vaill. act. 1720. 328. Bidens pentaphylla; Plum. Sp. 10. ic. 53. fig. 2.) "Leaves pinnated, ſerrated, marked with lines, ſmooth." *Root* annual. The plant is altogether that of Bidens frondoſa; but it has the flowers of C. verticillata, with a large ray of eight ſtriated, oval florets. A native of Virginia. 6. C. *trichoſperma.* Willd. 5. Mich. am. 2. 139. "Leaves pinnated, lanceolate, ſerrated, ſmooth; ſcales of the outer calyx ciliate-ſerrated." A native of Upper Carolina, in moiſt ground. 7. C. *ariſtata.* Willd. 5. (C. ariſtoſa; Mich. am. 2. 1. 140.) "Leaves pinnated, ſerrated, pubeſcent; horns of the ſeed very long, divaricated." A native of North America in the country of the Illinois. 8. C. *leucorhiza.* Mart. 18. Lour. Cochin. 508. "Leaves pinnated; pinnæ five, ſerrate-gaſhed; ray ſix-flowered; ſeed three-horned." *Root* ſpindle-ſhaped, fleſhy, white. *Stem* a foot and half high, herbaceous, erect, quadrangular, grooved. *Leaves* quinate, lanceolate. *Flowers* entirely ſaffron-coloured, few together, on terminal peduncles; florets of the ray ſix; egg-ſhaped, quite entire; horns of the ſeed beſet with inverted briſtles; calyx erect, many-leaved. A native of China. 9. C. *mitis.* Willd. 7. Mich. amer. 2. 140. "Lower leaves bipinnatifid; upper ones linear, three-parted; ſeeds naked." Calyxes generally ſimple, ſometimes ſomewhat calycled. A native of marſhes in Carolina. 10. C. *leucantha.* Linn. Sp. Pl. 6. Mart. 3. Lam. 6. (Bidens leucantha; Willd.) "Leaves pinnated, ſerrated: florets of the ray of a different colour from thoſe of the diſk." *Root* annual. *Stem* three or four feet high, quadrangular, ſmoothiſh; the oppoſite ſides channelled; branches oppoſite. *Pinnæ* five, ſeldom three, egg-ſhaped, undivided, ſmooth, equal, even; the three outer often confluent, almoſt decurrent by the outer ſide, quite entire at the tip; petioles channelled, connected on both ſides by villous hairs. *Flowers* terminal, alternate, two or three, on longiſh peduncles; inner ſcales of the calyx five; outer five, ſmaller, more diſtinctly ſeparated; florets of the ray five, egg-ſhaped, three-toothed, three-nerved underneath; diſk ſmall, convex, yellow. *Seeds* three-horned, hiſpid backwards. Linn. A native of Virginia. La Marck thinks it not diſtinct from C. coronata. 11. C. *odorata.* Lam. 7. (C. chryſantha; Linn. Sp. Pl. 5. Mart. 4. Willd. 7. Bidens americana triphylla; Plum. Sp. 10. ic. 53. fig. 1.) "Leaves ternate, ſerrated, ſmooth; floret of the ray of a different colour." *Root* ſweet-ſcented, whitiſh, fibrous. *Stem* about three feet high, quadrangular, ſmooth, ſweet-ſcented. *Leaves* oppoſite; generally compoſed of three egg-ſhaped, acute, ſmooth, toothed-leaflets. *Flowers* terminal, ſolitary; florets of the ray white; of the diſk-yellow, reſembling the common camomile. *Seeds* two-horned; receptacle almoſt hemiſpherical. Plum. MSS. A native of the Weſt Indies, and South America. Linnæus, in his ſpecific character, deſcribes the ray as ſimilar in colour to the diſk, and if he had not quoted Plumier as his only ſynonym, we ſhould have thought La Marck referred to a different plant. 12. C. *biternata.* Willd. 19. Lour. Coch. 508. “Leaves twice ternate, ovate-lanceolate, ſerrated; panicle diffuſe; ray ſix-flowered.” *Stem* two feet high, herbaceous, quadrangular, four-grooved. *Flowers* entirely yellow. *Seeds* with two branched horns. *Receptacle* flattiſh, naked. A native of China about Canton. The naked receptacle is inconſiſtent with the generic character. 13. C. *aurea.* Mart. 13. Willd. 9. Hort. Kew. 3. 252. “Leaves ſerrated; root ones three-parted; ſtem ones trifid or entire, lanceolate-linear.” *Root* perennial. A native of North America. 14. C. *tripteris.* Linn. Sp. Pl. 9. Mart. 5. Lam. 3. Willd. 10. (C. Virginianum, folio anagyridis; Moris. hiſt. 3. 21. tab. 3. fig. 44.) “Lower ſtem leaves pinnated, upper ones ternate, uppermoſt ſimple, petioled; leaflets lanceolate-linear.” *Root* perennial. *Stems* three or four feet high (ſix or ſeven; Mill.) erect, cylindrical, ſmooth, branched near the ſummit. *Flowers* ſolitary, in a looſe corymbus, with a yellow ray and brown diſk; florets of the ray pointed, entire or with two teeth. A native of Virginia. 15. C. *ſenifolia.* Willd. 11. Mich. am. 2. 138. “Leaves quite entire, ternate, ſeſſile.” A native of ſandy hills in Carolina. 16. C. *alba.* Linn. Sp. Pl. 8. Mart. 6. Lam. 8. Willd. 12. (C. ſcandens; Brown. Jam. 321. Chryſanthemum americanum, ciceris folio glabro; Herm. par. tab. 124. Pluk. alm. 101. tab. 160. fig. 3.) “Leaves generally ternate, wedge-ſhaped, ſerrated.” *Root* perennial. *Stems* a foot and half long, ſlender, incapable of ſupporting themſelves, branched. *Leaves* often quinate, ſmooth. *Flowers* terminal, peduncled; florets of the ray about eight, white; ſometimes with a tinge of purple, rather large; thoſe of the diſk orange-yellow. *Seeds* two-horned. A native of St. Cruz, one of the Antilles. 17. C. *fœtida.* Mart. 20. Willd. 13. Cav. ic. 1. 55. tab. 77. “Leaves heart-ſhaped, three-lobed, acuminate, ſerrated, middle lobe longer.” *Root* annual. *Stem* ſix feet high, erect, cylindrical, branched, cloathed with a ſhort glutinous nap. *Leaves* glutinous, fœtid, oppoſite; petioles long, connate at the baſe. *Flowers* in a corymb, entirely yellow; calyx-leaves ſixteen, ovate-acute, keeled; eight outer ones blackiſh-green, hirſute, glutinous; florets of the ray eight, three-nerved, ſomewhat emarginate. *Seeds* inverſely egg-ſhaped, obſcurely three-ſided, compreſſed, with two white capillary horns. A native of Mexico. 18. C. *reptans.* Linn. Sp. Pl. 3. Mart. 7. Lam. 9. Willd. 14. Smith ſpicil. 20. tab. 22. (Chryſanthemum trifoliatum ſcandens; Sloan. Jam. 125. hiſt. 1 261. tab. 154. fig. 2, 3.) “Leaves ſerrated, egg-ſhaped; upper ones ternate; ſtem creeping.” *Root* annual, ſmall, fibrous. *Stem* five feet high, weak, climbing, ſquare at the baſe, ſomewhat cylindrical above, ſtriated, branched. *Leaves* oppoſite, acute, veined, ſoft, ſlightly downy, bright green, paler underneath; petioles channelled, hairy. *Flowers* entirely gold-coloured; peduncles from three to five, from the axils of the top leaves, erect, cylindrical, ſtriated, hairy, ſingle-flowered; ſometimes with two or three lanceolate bractes at the baſe; calyx nearly cylindrical; a few of the outer leaves ſpreading; florets of the ray four-toothed, veined; anthers half excluded, brown; germ linear, ciliate at the edges, ſtigmas downy above, obtuſe. Smith. A native of Antigua. 19. C. *heterophylla.* Willd. 15. Cav. ic. 3. 34. tab. 268. “Leaves ſcabrous; thoſe from the root, panduriform, repand; on the ſtem, lanceolate, ſerrated, attenuated at the baſe, nearly ſeſſile.” A native of Mexico. 20. C. *baccata.* Linn. jun. Supp. 380. Mart. 8. Lam. 11. Willd. 16. “Leaves egg-ſhaped, ſerrated: ſeeds reſembling a berry.” *Stem* eight feet high, herbaceous, erect. *Leaves* oppoſite, petioled, three-nerved. *Flowers* yellow, peduncled, often three together, terminal; calyx-leaves ſixteen, lanceolate, recurved, the length of the diſk; florets of the ray three-toothed. *Seeds* naked, nearly globular, black, ſomewhat tetragonous, ſitting on a convex receptacle and forming an aggregate not unlike the compound berry of rubus; down none. A native of Surinam. The naked ſeeds exclude it from this genus, independent of the peculiar ſtructure of the fruit. 21. C. *auriculata.* Linn. Sp. Pl. 7. Mart. 9. Lam. 4. Willd. 17. Mich. Amer. 2. 138. (Chryſanthemum hirſutum virginianum; Pluk. Alm. 101. tab. 83. fig. 5. and tab. 242. fig. 4. C. virg. trifoliatum; Moris. Hiſt. 3. 20. tab. 3. fig. 45.) “Leaves quite entire, egg-ſhaped; lower ones ternate.” *Root* perennial. *Stem* a foot and half or two feet high, filiform, cylindrical, ſlightly villous, a little branched towards the top. *Leaves* oppoſite, connate; lower ones with two ſmall leaves at the baſe which make them appear auricled, ſmooth above, ſlightly villous underneath; petioles channelled. *Flowers* entirely yellow, terminal; florets of the ray eight, large, five-toothed. A native of Virginia. 22. C. *lanceolata.* Linn. Sp. Pl. 10. Mart. 10. Lam. 5. Willd. 18. Mich. Am. 2. 137. (Bidens ſucciſæ folio; Dill. Elth. 55. tab. 48. fig. 56. B. caroliniana; Mart. Cent. tab. 26.) “Leaves lanceolate, quite entire, ciliated.” *Root* biennial. *Stems* ſeveral, a foot and half high, decumbent at the bottom, thence riſing obliquely. *Root-leaves* long, ſpread on the ground, thickiſh, narrowed towards the baſe, reſembling thoſe of ſcabioſa ſucciſa. *Flowers* large, yellow; peduncles long, ſmooth; florets of the ray eight or nine, deeply four-toothed. *Seeds* with three horns. A native of Carolina. 23. C. *craſſifolia.* Mart. 14. Willd. 19. Hort. Kew. 3. 253. “Leaves inverſely egg-ſhaped, oblong, obtuſe, quite entire, pubeſcent.” *Root* perennial. A native of Carolina, flowering from Auguſt to September. 24. C. *latifolia.* Willd. 20. Mich. Amer. 2. 137. Lam. Illuſt. tab. 794. fig. 2? “Leaves egg-ſhaped, acuminate, crenate-toothed; ſeeds naked.” A native of Carolina, on high mountains. 25. C. *anguſtifolia.* Mart. 15. Willd. 21. Hort. Kew. 3. 253. “Leaves alternate, linear-lanceolate, quite entire, even ſurfaced; florets of the ray oblong, trifid; middle ſegment larger.” A native of Carolina and Florida. 26. C. *alata.* Willd. 22. Cav. ic. 3. 30. tab. 260. “Stem winged; leaves alternate, ſcabrous, roundiſh egg-ſhaped, wedge-ſhaped at the baſe, triplinerved.” *Root* perennial. A native of Mexico. 27. C. *alternifolia.* Linn. Sp. Pl. 11. Mart. 12. Lam. 10. Willd. 24. Jacq. Hort. 2. tab. 110. Gært. tab. 171. fig. 9. (Chryſanthemum virginianum, alato caule. Moris. Hiſt. 3. 25. tab. 7. fig. 75, 76. Pluk. Alm. 100. tab. 159. fig. 3.) “Leaves lanceolate, ſerrated, alternate, petioled, decurrent.” Linn. “Stem winged; leaves lanceolate, on ſhort petioles, ſerrated; flowers in corymbs; florets of the ray lanceolate.” Willd. *Root* perennial. *Stems* ſeveral, from five to ſeven feet high or more, erect, firm, ſimple. *Leaves* about five inches long, rugged on both ſides, of a dirty green colour, narrowed at the baſe; the lower ones three or four together or two oppoſite; the reſt alternate. *Flowers* yellow, in a terminal corymb; calyx many-leaved, ſpreading very much; florets of the ray diſtant, two-horned. A native of North America, from Canada to Virginia, flowering in October and November. 28. C, *ovata.* Willd. 23. Cav. ic. 3. 41. tab. 280. “Stem winged; leaves alternate, oblong, nearly ſeſſile, ſerrated; flowers in corymbs; florets of the ray elliptical.” *Root* perennial. Very ſimilar to the preceding, perhaps only a variety. A native of Mexico. 29. C. *procera.* Willd. 25. Hort. Kew. 3. 253. “Leaves elliptical, acuminate, ſerrated, petioled,

tioled, veined, decurrent; lower ones whorled; upper ones alternate." *Root* perennial. A native of North America, flowering in September and October. Profeſſor Martyn conjectures that this is the alternifolia of Linnæus, and that the alternifolia of Hortus Kewenſis is a different plant. 30. C. *radiata.* Mill. Mart. 17. "Leaves linear-lanceolate, ſharply ſerrated, oppoſite; ray of the flower large, entire." *Root* annual. Stems four feet high, erect. *Leaves* from three to four inches long, three quarters of an inch broad, acuminate, on ſhort petioles. *Flowers* two from each of the upper joints of the ſtem, oppoſite; peduncles, long, ſlender, bearing two or three pairs of ſmall leaves or bractes, one-flowered; florets of the ray ſeven, oval, entire; of the diſk numerous, dark-coloured. A native of South Carolina, flowering in Auguſt; raiſed by Miller from ſeeds ſent by Dr. Dale.

Coreopsis *Bidens*; Linn. See Bidens *cernua.*

Coreopsis *foliis linearibus integerrimis*; Gron. See Rudbeckia *anguſtifolia.*

Propagation and Culture. Moſt of the perennial ſpecies are hardy and may be readily increaſed by parting the roots. The ſecond and fourteenth require a light loamy earth and ſunny expoſure. The annuals ſhould be ſown in a hot-bed and afterwards tranſplanted into a warm border.

Coreopsis, in *Gardening,* contains plants of the flowering herbaceous perennial kind; of which the ſpecies cultivated are the whole leaved coreopſis, or tick ſeed ſun-flower. (C. *verticillata.*) The three leaved coreopſis. (C. *tripteris.*) The alternate leaved coreopſis. (C. *alternifolia.*) The ſpan leaved coreopſis. (C. *lanceolata.*)

Method of Culture. The mode of propagation in theſe plants is eaſily effected, either by ſlipping or dividing the roots in autumn when the ſtalks decay, planting them out where they are to remain, keeping them clean from weeds, and cutting down the ſtalks annually in autumn when they begin to decay. The third and fourth ſorts may be rendered more forward by the uſe of a hot-bed. All theſe plants are well calculated for the more large borders and clumps, introducing them in the vacant ſpaces between ſhrubs, as they exhibit a plentiful bloom till late in the autumnal months.

Coresium, in *Ancient Geography,* a lake or marſh in the iſland of Crete. Steph. Byz.

CORESSUS, one of the four towns of the iſland of Ceos, according to Suidas. Ptolemy calls it *Cereſſus*; Strabo, and alſo Steph. Byz. denominate it *Coriſſia.*

Coressus, or *Coreſus,* a name given by Xenophon, Diodorus Siculus, &c. to a high mountain of Aſia Minor in Ionia, about 40 ſtadia from the city of Epheſus. At the foot of this mountain was a town of the ſame name, called by Steph. Byz. *Coriſſos,* which he repreſents as a town of Epheſus, becauſe of its dependence upon it. He ſays that it derived its name from the following circumſtance. Diana, having been delivered of Latona, and having brought her hither aſked of the people of the country to whom this place belonged? they replied "Κορη, σος." Virgin, it is yours. In this fable is traced the etymology of the name.

CORETA, in *Botany,* Brown. See Corchorus *ſiliquoſus.*

CORETT, in *Ichthyology,* the name of a large Eaſt Indian fiſh of the tunny kind, and ſuſpected to be no other than the common tunny, or Scomber *Thynnus.* It grows to ſix or ſeven feet long. Its eyes are large, and their iriſes yellow; its tail is broad and forked, and in colour of a yellowiſh green; its belly-fins are yellowiſh, and its belly of a fine bright gloſſy blue, with a ſilvery caſt. It is generally caught with hooks, and is a very fine taſted fiſh. Ray.

CORETUM, in *Ancient Geography,* a gulf of Palus-Mæotis, according to Pliny; who ſays that a mountain of rocks ſeparated this gulf from the lake of Buges, into which the river Hypanis diſcharged itſelf.

COREVA, or Coreba, a place of Africa propria, on the route from Turburba to Tacape, between Valli and Muſti, according to Antonine.

COREUR, a town of India on this ſide of the Ganges, according to Ptolemy. It is thought to be the ſame with *Cereura.*

CORFE CASTLE, in *Geography,* is an ancient market-town, ſituated near the centre of the Iſle of Purbeck in Dorſetſhire, England; at the foot of a range of hills, on a riſing ground, declining to the eaſt. Its origin muſt undoubtedly be attributed to the caſtle, which exiſted previous to the year 980: though the town itſelf does not appear to have been of any importance till after the conqueſt, it being wholly unnoticed in Domeſday book. The manor and caſtle ſeem always to have deſcended together. Though this is an ancient borough by preſcription, it was not incorporated till 18th Eliz., when ſir Chriſtopher Hatton obtained a charter, inveſting the inhabitants with liberties ſimilar to thoſe of the Cinque-ports, with various other privileges: theſe were confirmed by James I. and Charles II. The government of the town is veſted in a mayor, and eight barons who have ſerved the office of mayor. The earlieſt return to parliament was in 14 Eliz.; the right of election is poſſeſſed by all perſons within the borough who are ſeized in fee, in poſſeſſion, or reverſion, of any meſſuage, or tenement, or corporal hereditament, and in ſuch as are tenants for life or lives, and in want of ſuch freehold, in tenants for years, determinable on any life or lives, paying ſcot and lot. The town conſiſts chiefly of two ſtreets of ſtone buildings. The church, a large ancient fabric, compriſes a nave, chancel, two ailes, and a large embattled tower: twelve irregular arches ſupport the roof, and four pillars, in the Saxon ſtyle, but all different, are connected with the porch. The number of houſes in the late return was 152; and of inhabitants 741; many of whom find employment in the neighbouring clay-works and ſtone quarries; and a few in knitting ſtockings. A weekly market is held on Thurſdays. This town is 116 miles S.W. from London. The diſtrict which includes Corfe caſtle, and is about ten miles in length and eight in breadth, contains twelve or thirteen ſunday ſchools, diſtributed through the different pariſhes; each being governed by a committee of the principal inhabitants, ſubject to the ſuperintendance of a general committee who meet at Corfe caſtle as occaſion may require. The average number of children who attend theſe ſchools is about 400. Dorſetſhire was one of the firſt counties in which Sunday ſchools were eſtabliſhed. Some excellent regulations, relative to the general management of theſe inſtitutions, may be ſeen in Hutchins's Dorſet, vol. i. p. 308, 2d edit.

The caſtle at Corfe "ſtands a little north of the town, oppoſite to the church, on a very ſteep rocky hill, mingled with hard, rubbly chalk-ſtone, in the opening of thoſe ranges of hills that incloſe the eaſt part of the iſle. Its ſituation between the ends of theſe hills deprives it of much of its natural and artificial ſtrength, being ſo much commanded by them, that they overlook the tops of the higheſt towers; yet its ſtructure is ſo ſtrong, the aſcent of the hill on all ſides but the ſouth ſo ſteep, and the walls ſo maſſy and thick, that it muſt have been one of the moſt impregnable fortreſſes in the kingdom before the invention of artillery. It was of great importance in reſpect to its command over the whole iſle; whence our Saxon anceſtors juſtly ſtyled it Corf gate, as being the paſs and avenue into the beſt part of the iſle." (Hutchins's Dorſet, i. 280.) The caſtle is ſeparated from the town by a ſtrong bridge, of four very high, narrow, ſemicircular arches, croſſing a deep moat, now dry. The bridge leads to the gate of the firſt ward, which remains nearly entire, probably from the thickneſs of the walls, which, from the outward to the inner facing, is in ſome parts full nine yards. On the higher part of the hill, at ſome diſtance from the centre of the fortreſs, ſtands the keep or citadel, which ſtill retains nearly its original height, and commands a very extenſive proſpect to the north and weſt.

The preciſe period when this caſtle was built is uncertain; but from concurrent circumſtances its erection is aſcribed to king Edgar. That it did not exiſt previouſly to the year 887, when the nunnery at Shaftеſbury was eſtabliſhed, is certain, from an inquiſition taken 54 Hen. III.; wherein the jurors returned, "that the abbeſs and nuns at Shaſton (Shafteſbury) had, without moleſtation, before the foundation of the caſtle at Corfe, all wrecks within their manor of Kingſton, in the iſle of Purbeck.'

Between two and three miles eaſtward of Corfe, is *Nine Barrow Down*, an eminence ſo named from nine *large* barrows ſituated on it in a line, ſuppoſed to be of Britiſh conſtruction. The whole number of barrows on this down are ſixteen of various dimenſions; moſt of them circular, and very regularly ſhaped. A ſhallow trench ſurrounds eight or ten; and near them is a hollow or cavity. The higheſt part of the down riſes 642 feet above low water mark.

At a ſmall diſtance, north weſt of Corfe, is *Grange* or *Creech Grange*, the ſeat of John Bond, eſq.; it anciently was part of the poſſeſſions of the abbey of Bindon, and the occaſional reſidence of the Abbot. Hutchins's Hiſtory of Dorſetſhire.

CORFINIUM (*S. Pelino*), in *Ancient Geography*, a town of Italy, the capital of the Peligni, ſituated at a ſmall diſtance from the Aternus, on a delightful plain ſurrounded by mountains. In the time of the Social war, A. U. C. 662, the allies fortified it, and made it a place of arms. During the civil wars, Cæſar obliged Domitian to retire hither, beſieged him there, and took the place.

CORFU, in *Geography*, the ancient Corcyra (which ſee), an iſland of the Mediterranean, at the mouth of the Adriatic, near the coaſt of Albania, about 15 leagues long and 8 wide. In ancient times the inhabitants of this iſland formed a powerful republic; in ſucceeding times it belonged to the king of Naples; and it was afterwards ſold for 30,000 ducats to the Venetians, who maintained a fleet of galleys in the port, and a ſtrong garriſon to defend this and the neighbouring iſlands. It was ſeized by the French in 1797; and by an article in the treaty of Campo Formio, in 1797, the French republic was allowed by his majeſty, the emperor, king of Hungary and Bohemia, to poſſeſs, in full ſovereignty, the ci-devant Venetian iſlands of the Levant, *viz.* Corfu, Zante, Cephalonia, St. Maure, Cerigo, and other iſlands dependent on them, together with all the ci-devant eſtabliſhments in Albania, which are ſituate lower down than the gulf of Lodrino. In 1799 this iſland was taken by the Ruſſians, and, together with Cephalonia and Zante, &c. conſtitute an independent republic under the protection of Ruſſia.

This iſland is ſaid to contain about 50,000 perſons, and is divided into four bailiwicks or governments. The religion of Corfu is partly that of the Latin and partly that of the Greek church. The latter has for its chief a proto-papa, or head-prieſt, elected in an aſſembly of the clergy and nobility; he is immediately dependent on the patriarch of Conſtantinople, and poſſeſſes all the epiſcopal powers. His office laſts five years, and he then returns to the claſs of ordinary papas, with the privilege of wearing a crimſon girdle. His revenue is confined to the perquiſites of his office, the amount of which he continues to increaſe, as an indemnity for the expence he incurred in procuring his nomination. To the cathedral there are canons attached, as to that of the Latin church; but they have no fixed prebend. The only advantage accruing from their canonicate is that of being at the head of the clergy, together with the honour of wearing a violet girdle, and a ſmall taſſel of the ſame colour to their hats. The number of churches in Corfu is very conſiderable. Each officiating prieſt is annually elected by the aſſembled pariſhioners; but he has no fixed ſalary. Moſt of the churches, eſpecially thoſe in the country, have been built by private perſons, who, as proprietors, nominate the papa. The richeſt of theſe churches is that in which are depoſited the relics of St. Spiridion, to whom the Greeks pay a peculiar devotion; and the feſtival of this ſaint is celebrated with the greateſt pomp. The night between Holy Thurſday and Good Friday is remarkable for the number of proceſſions which perambulate the city.

In the iſle of Corfu are ſeveral convents of men and women, which tend very much to oppreſs the inhabitants. The ignorance of the Greek clergy, eſpecially in the rural parts, is ſo great as to be proverbial; the moſt learned among them being hardly capable of writing and reading their own language.

The air of this iſland is healthy, the land fertile, and the fruit excellent. Oranges, citrons, the moſt delicious grapes, honey, wax, and oil are very abundant. Some places are mountainous and barren, and good water is ſcarce. Salt forms a great part of its riches.

Corfu, the capital of the fore-mentioned iſland, the ſeat of a bailiff, a proveditor, a captain, &c. and the ſee of an archbiſhop. It is fortified, and defended by two fortreſſes; the town has a good harbour and a conſiderable trade. N. lat. 39° 42′. E. long. 20° 2′.

CORGA, a country of India, near the coaſt of Malabar, bounded on the N. and E. by the Myſore country, on the S. by the country of the Nayrs, and on the W. by the ſea.

CORGATHEA, in *Ancient Geography*, a town of India, according to Ptolemy.

CORGOLOIN, in *Geography*, a town of France, in the department of the Côte d'Or, and diſtrict of Beaune; 5 miles N. of Beaune.

CORI, anciently *Coria*, a town of Italy, in the Campagna di Roma; 10 miles S. of Paleſtrino.

CORIA, or Curia, in *Ancient Geography*, a town of the iſle of Albion, in the country of the Damnii, according to Ptolemy. The conjectures about the ſituation of this place are various and doubtful; but, upon the whole, that of Mr. Baxter ſeems to be the moſt probable, who places it at Kirkintilloch, a place of great antiquity, upon the wall, about 6 miles from Glaſgow.—Alſo, a town of Albion, belonging to the Otadeni, and ſuppoſed to be Corbridge in Northumberland by Camden and Baxter; but Horſley imagines it to have been ſituated much farther north, probably at Jedburgh, and ſuſpects it to have belonged to the Gadeni.—Alſo, a place of Greece, in the Peloponneſus; near the town of Helice, according to Ælian.—Alſo, a town of Italy, near Rome. See Cori.

Coria, in *Geography*, a town of Spain, in the province of Eſtremadura, the ſee of a biſhop. It contains two churches, two convents, and two hoſpitals; near it are medicinal ſprings; 90 miles E. of Toledo, and 110 E.S.E. of Madrid. N. lat. 39° 36′. Long. 10° 28′ E. of Peak of Teneriffe.—

—Alſo, a town of Spain, in the country of Seville, on the Guadalquivir; 7 miles from Seville.

CORIACO, a town of S. America, in the province of Cumana, on a gulf to which it gives name; 40 miles E. of New Cordova. It contains about 6500 perſons.

CORIALLUM, in *Ancient Geography*, a place of Gaul, in the Lyonnenſis ſecunda; near the cape de la Hogue, according to d'Anville.

CORIANDER, in *Agriculture*, the name of a plant which is cultivated in the field by the farmer in ſome diſtricts, though not to any very great extent. In both Eſſex and Kent it is, however, occaſionally met with as a field crop.

In its culture it is adviſed, that the ſeed ſhould be ſown in the autumnal ſeaſon, on rich, friable land, which has been well prepared by tillage; and that when the plants have riſen above the ſurface of the ground, they ſhould be hoed out to the diſtance of about four inches every way, clearing them well from all ſorts of weeds. It is ſuppoſed that by this management they will become ſtrong, and produce a greater quantity of good ſeed.

The advantages of cultivating this ſort of crop are thus ſtated in the fourth volume of the Letters and Papers of the Bath Society.

Sowed ten perches of land with coriander ſeed, the ſoil a good ſandy loam.

Expences.

	£.	s.	d.
Three ploughings	0	1	6
Sowing and harrowing	0	0	1
Four pounds of ſeed, at 3 *d.*	0	1	0
Harveſting	0	0	3
Ripling	0	1	0
Rent	0	2	0
	0	5	10

Produce.

	£.	s.	d.
87 pounds of coriander ſeed, at 3 *d.*	1	1	9
Deduct expences	0	5	10
Profit	0	15	11

or 15 *l.* 18 *s.* 4 *d.* per acre.

The author of the paper obſerves, that he has ſince made ſeveral larger experiments in this article, but that none has proved ſo good a crop as the preceding, yet all of them ſuch as to afford a good profit. There is a ready ſale for the ſeed with the diſtillers, druggiſts, and confectioners. The former purchaſe very large quantities: the price varies from 16*s.* to 42*s.*

According to Mr. Vancouver, in his Account of Eſſex Huſbandry, the mode of cultivation is thus performed. "The culture of coriander, which has been much attended to in the neighbourhood of Tolſhunt Darcey, is, he ſays, thus managed: old lay-ground is ploughed in the beginning of March, and after the ſurface is completely pulverized, the ſeed is ſown fourteen pounds to the acre; thrice hoeing and ſetting out the plants four inches ſquare will coſt one guinea per acre. Average produce, 10 *cwt.* per acre, 12*s.* per *cwt.* This is conſidered to be a very good preparation, after once ploughing, for wheat; and as the land is generally ploughed in two yard ridges, or ſtitches of eight furrows wide, a row of beans is generally planted with the coriander, on each ſide of the open furrows between the ſtitches, and are uſually harveſted at the ſame time.

"It is frequently the caſe in this diſtrict to cultivate a triple ſort of crop, conſiſting of coriander, carraway, and teaſel.

"When (ſays the above writer) carraway is ſown with the coriander, from the care and attention neceſſarily beſtowed on diſtinguiſhing the plants, the hoeing ſeldom coſts leſs than one guinea and a half per acre; but the carraway is not regularly ſet out for a crop till after the coriander is harveſted, at which time a very expenſive hoeing becomes indiſpenſably neceſſary.

"Teaſel is ſometimes cultivated in the ſame field, the ſeed being ſown with the coriander and carraway; but as neither the carraway nor teaſel come completely and regularly the ſecond year, both crops are uſually allowed to ſtand for the third ſummer. This is eſteemed good management for old coarſe paſture grounds, which, after three ploughings, are commonly ſown with wheat, and then clean chalked."

The following directions are given for this culture, by Mr. Sewell of Mapleſtead: "about the beginning of March, plough ſome old paſture land; if it has been paſture for a century, the better; and the ſoil ſhould be a very ſtrong clayey loam. Mix 12 *lbs.* of carraway, 10 *lbs.* of coriander, and 12 *lbs.* of teaſel ſeeds together, which is ſufficient for one acre; ſow directly after the plough and dreſs (he ſuppoſes harrow) the land well. When the plants appear of ſufficient ſtrength to bear the hoe (which will not be until about ten weeks after ſowing), it muſt not be omitted, and in the courſe of the ſummer it will require three hoeings, and one at Michaelmas; each will be about 8 *s.* per acre. The coriander is annual, and is fit to cut about the beginning of July: it ſhould be left in the field after cutting, and threſhed on a cloth, in the ſame manner as rape ſeed.

"About April following, your teaſel and carraway will want a good hoeing, done deep and well, and another hoeing about the beginning of June; theſe two hoeings are to be done at 7 *s.* per acre each. The carraway will be fit to cut the beginning of July, and muſt be threſhed in the ſame manner as coriander. The teaſel will not be ready till the middle of September, when thoſe heads which are beginning to turn brown are cut off the ſtem, with a ſtalk a foot long, and 25 of them are tied in a bunch, 24 of the bunches are fixed on a ſmall ſtick, and called a row, 240 of which make a load in bulk, equal to a ton of hay from the meadow. The work of cutting and bunching the teaſel can only be done by thoſe who have been well acquainted with and learned the mode; it muſt be looked over, and the heads cut at ſeveral times, as they ripen. The teaſel and carraway are perennial, and ſome of the plants do not perfect their ſeeds till the third or fourth year, though in general you have a crop the ſecond year, and the ſeeds that are ſcattered from the crop the ſecond year often come to perfection the fourth year; he has known inſtances of this being continued for ſeven years. The uſual way is to plough directly after the crop is gathered the third year, and ſow wheat, of which commonly a good crop is obtained, the land being in fine order, from the turf being rotted, and the repeated hoeings. See Teasel.

"The firſt appearance of teaſel, after it is ſown, is much like a lettuce, coriander like a parſnip, and carraway like carrots. The produce of carraway has often been, on the very rich old lays in the hundreds or low lands of the county, 20 *cwt.* per acre. There is always a demand for it in the London market, ſometimes ſo low as 12*s.* per *cwt.*, and it has been up to 50*s.* per *cwt.*; moſtly on an average at 21 *s.*

Coriander is alſo very productive on good land, often producing 24 *cwt.* per acre, ſometimes not more than 6 or 7 *cwt.*, the price being ſometimes 30*s.* per *Cwt.*, often ſo low as 10*s.*, average in general about 16*s.*, London market. Teaſel is uſed only amongſt the manufacturers of ordinary cloth and baizes, to raiſe the wool on them that covers the thread. As we have a large buſineſs of that kind carried on in this part of the country, we have a regular demand for teaſel; the average price 12*l.* per load, the produce ſometimes a load per acre, often not more than one-fourth of a load. The land can only be filled with plants, and the more one kind predominates, the leſs muſt reaſonably be expected of the crop that ſucceeds. It is moſtly ſown on land ſo ſtrong, as to require being a little exhauſted to bring it fit for bearing corn. In moſt of the land ſown with carraway and coriander the teaſel is omitted, as being a more troubleſome and uncertain crop, and generally the product of carraway is much greater without than with teaſel.

"In many parts of this diſtrict there are gardening-farmers who travel about and contract for breaking up old graſs-land, in order to ſow carraway. The farmer ploughs to a great depth, and does whatever horſe-work is wanted, finding the land alſo at a rent of 15*s.* per acre on ſome farms, and the produce is divided. It is reckoned a more profitable way of breaking up graſs than for common crops; but, much depending on a variable price, is reckoned hazardous; though the carraway men have intelligence enough among themſelves to aim at not overſtocking the market.

"It is obſerved, that the coriander is always the firſt crop, the carraway being ſown with it as clover is with barley to ſucceed it; and it is left from three to ſix years, according to the ſucceſs; great hoeing is beſtowed on it to keep the land clean: when it returns to the farmer, if there be twitch he fallows, if not, he ſows wheat. With ſome farmers their half receipt from 30 acres has varied from 180*l.* to 300*l.* a year."

CORIANDER, in *Botany.* See CORIANDRUM.

CORIANDRUM, (*κοριον*, or *κοριαννον*; Theophras. Dioſcor. Coriandrum; Plin. Suppoſed to be ſo called from *κορις*, *a bug*; the bruiſed leaves ſmelling like that offenſive inſect.) Tourn. Cl. 7. § 3. gen. 2. Linn. gen. 356. Schreb. 488. Willd. 552. Gært. 109. Juſſ. 220. Vent. 3. 16. Claſs and order, *pentandria monogynia.* Nat. Ord. *Umbellatæ*, Linn. *Umbelliferæ*, Juſſ.

Gen. Ch. *General umbel* flat. *Partial umbel* generally with abortive flowers in the centre. *General involucre* one-leafed, or none. *Partial involucre* going half way round; or none. *Calyx proper* five-toothed, ſtanding out. *Cor.* Petals five, equal or unequal, emarginate, inflexed. *Stam.* Filaments five; anthers roundiſh. *Piſt.* Germ inferior; ſtyles two, diſtant; ſtigmas capitate. *Peric.* none. Fruit ſpherical, dividing into two. *Seeds* two, concave.

Eſſ. Ch. Petals inflexed, emarginate. General involucre one-leafed or none; partial, going half way round, or none. Fruit ſpherical, or ſcrotiform.

Sp. 1. C. *ſativum.* Linn. Sp. Pl. 1. Mart. 1. Lam. 1. Willd. 1. Gært. tab. 22. fig. 2. Lam. Illuſt. Pl. 196. fig. 1. Woodv. Med. Bot. tab. 181. Eng. Bot. Pl. 67. Bauh. Pin. "Fruit globular." *Root* annual, ſtrong-ſcented. *Stem* about a foot and half high, erect, ſmooth, ſlightly ſtriated, cylindrical, generally branched and divaricated. *Leaves* compound; lower ones pinnated; leaflets roundiſh-wedge-ſhaped, lobed and toothed; upper ones twice-ternate; ſegments linear. *General and partial umbels* many-rayed. *General involucre* of one linear leaf; *partial involucre* from three to five-leaved, going half way round; leaves lanceolate. *Flowers* white, tinged with red; proper calyx very conſpicuous; outer petals of the outer flowers large, forming a kind of ray round the umbel. *Fruit* obſoletely ribbed, aromatic. A native of the ſouthern parts of Europe and of China; naturalized in Suffolk about Ipſwich, and in ſome parts of Eſſex. Every part of the plant, when freſh, has a very offenſive ſmell; but the dried ſeeds have a tolerably grateful ſmell, with a moderately warm and ſlightly pungent taſte. They are ſtomachic and carminative, and are commonly ſold by the confectioners encruſted with ſugar. When taken in large quantities they are ſaid to be deleterious, but Dr. Withering aſſerts that he has known ſix drams of them taken at once, without any remarkable effect. They give out their virtue totally to rectified ſpirit, but only partially to water. The Edinburgh college uſe them in the bitter infuſion and the preparations of ſenna, to cover the diſagreeable taſte, and prevent the griping tendency of thoſe medicines. 2. C. *teſticulatum.* Linn. Sp. Pl. 2. Mart. 2. Lam. 2. Ill. Pl. 196. fig. 2. Willd. 2. (C. minus teſticulatum; Bauh. Pin. 158. Pluk. alm. 120. tab. 169. fig. 2.) *β.* C. ſylveſtre fœtidiſſimum; Bauh. Pin. 158. "Fruit didymous." *Root* annual. *Stem* ſcarcely a foot and half high, angular, branched. *Leaves* once or twice pinnated; leaflets deeply cut into narrow acute ſegments. *Umbels* ſmall, often ſimple. *Partial involucre* none, outer *petals* not forming a ray. *Seeds* ſeparating below, almoſt cohering above, a little wrinkled, but not ſtriated. A native of the ſouth of Europe.

Propagation and Culture.—Both ſpecies are raiſed from ſeeds ſown in the autumn, in an open ſituation, on a bed of good freſh earth. When the plants are come up, nothing farther is neceſſary but to hoe them to about four inches diſtance every way, and to keep them clear from weeds. The firſt ſpecies is cultivated in Eſſex, mingled with carum carui, or carraway; both ſolely for the ſake of the ſeeds. See CARUM CARUI. To prevent the largeſt and beſt part of the ſeed being loſt, women and children are employed to cut every plant ſeparately, and to put it immediately into a cloth, in which it is carried to ſome convenient part of the field, and there threſhed upon a ſail-cloth. The produce of an acre is from ten to fourteen hundred weight. See CORIANDER, in *Agriculture.*

CORIARIA, (ſo called from its uſe in tanning hides.) Lin. Gen. 1129. Schreb. 1540. Juſſ. 441. Vent. 43. Redoul; Enc. Claſs and order, *diœcia decandria* (Polygamia; Gowan.) Nat. Ord. undetermined.

Gen. Ch. *Flowers* dioicous, ſometimes monoicous or polygamous. *Male. Cal.* Perianth very ſhort, five-leaved; leaves ſomewhat egg-ſhaped, concave. *Cor.* Petals (Gland. Juſſ.) five, very ſmall, placed on a diſk on the outſide of the ſtamens. *Stam.* Filaments ten, very ſhort; anthers erect, oblong, with two cells ſeparate at the baſe. *Female Cal.* like the male. *Cor.* Petals, as in the males, converging. *Stam.* as in the males, but abortive. *Piſt.* Germs five, compreſſed, united; ſtyles long, briſtle-ſhaped; ſtigmas ſimple. *Peric.* none. *Seeds* five, kidney-ſhaped, covered by the ſucculent petals which take the appearance of a berry; Linn. (*Peric.* Capſules five, connivent, ſmall, one-ſeeded, not dehiſcent, covered on the ſide by the enlarged and thickened glands, making the fruit look like half a berry; Juſſ.)

Eſſ. Ch. Calyx five-leaved; corolla five-petalled; anthers ten, almoſt ſeſſile. Styles five. Seeds five, covered by the ſucculent petals.

Sp. 1. C. *myrtifolia.* Linn. Sp. Pl. 1. Mart. 1. Poir. 1.

Lam. Ill. Pl. 822. (Rhus myrtifolia monſpeliaca; Bauh. Pin. p. 414.) "Leaves almoſt ſeſſile, ovate-oblong, flowers in racemes." A ſhrub four or five feet high. *Stems* ſmooth, cinereous; branches oppoſite, looſe, flexible; young ones quadrangular. *Leaves* oppoſite, entire, ſmooth, acute, green on both ſides, nerved, ſmaller on the flowering branches. *Racemes* ſimple, terminating the young lateral branches; bractes ſolitary, ſmall, awl-ſhaped; peduncles twice the length of the bractes; calyx and corolla pale green; flowers ſometimes monoicous, and ſometimes hermaphrodite. A native of the ſouth of France, and of Africa about mount Atlas. 2. C. *ruſcifolia.* Linn. Sp. Pl. 2. Mart. 2. Poir. 2. Feuill. Peruv. 3. 17. tab. 12. "Leaves cordate egg-ſhaped, ſeſſile." A tree from twenty to twenty-five feet high. *Trunk* the thickneſs of a man, branched from the bottom. *Leaves* an inch and half long, an inch broad. *Leaves* oppoſite, ternate on the young branches, almoſt embracing the ſtem. *Flowers* as in the preceding ſpecies. A native of Chili. 3. C. *microphylla.* Poir. 3. "Leaves very ſmall, egg-ſhaped, obtuſe, nearly ſeſſile; flowers ſpiked, lateral." A ſhrub. *Stems* quadrangular; branches numerous, crowded, filiform, flexible, ſhort. *Leaves* four or five lines long, three broad, oppoſite, firm, entire, ſlightly heart-ſhaped, green above, paler underneath, nerved. *Flowers* on ſmall filiform peduncles, with ſolitary acute bractes. A native of Peru. 4. C. *ſarmentoſa.* Mart. 3. Poir. 4. Forſt. Flor. Auſt. 71. "Leaves cordate egg-ſhaped, on ſhort petioles; ſtem procumbent, diffuſe. A native of New Zealand.

CORIARIO. See ARTO LEONE.

CORIBRASSUS, in *Ancient Geography*, an epiſcopal town of Aſia, in Pamphylia.

CORICANI. See CORITANI.

CORICÆ *inſulæ*, ſmall iſlands between the iſland of Crete and the Peloponneſus. Pliny.

CORICEON *promontorium*, a promontory S. of the peninſula of Ionia, which advances towards the iſle of Chios, in which is found Erythræ.

CORICEUM, in *Antiquity*, the undreſſing-room belonging to the GYMNASIUM.

CORIDERVA, in *Geography*, a rock ſituated about $2\frac{1}{2}$ miles S.W. from Ila, one of the weſtern iſlands of Scotland.

CORIDIS FOLIO, in *Botany;* Herm. See LINEARIA.

CORIDOR, is uſed, in *Architecture*, for a gallery, or long iſle, around a building leading to ſeveral chambers at a diſtance from each other, ſometimes wholly incloſed, and ſometimes open on one ſide.

CORIDOR, or *Corridor*, in *Fortification*, the ſame as the *covert-way*, which ſee.

CORIDORGIS, in *Ancient Geography*, a town of Germany, ſituated on the Danube, between Medoſtanium and Phurgiſates. Ptolemy.

CORIENTES, in *Geography*, a cape of Mexico, or New Spain, on the N. Pacific ocean. N. lat. 20° 50′. W. long. 105° 30′.—Alſo, a cape of ſouth America, on the coaſt of Peru, in the Pacific ocean. N. lat. 4° 50.—Alſo, a cape of Africa, on the eaſtern coaſt in the Indian ſea. S. lat. 24° 15′. E. long. 33° 31′.—Alſo, the name of the ſouth-weſternmoſt point of the iſland of Cuba. N. lat. 21° 38. W. long. 84° 30′.

CORIENTES, *Los.* See CORRIENTES.

CORILLA, in *Biography*, the Arcadian name given to the celebrated *Improviſatrice,* Maria Maddalena Morelli Fernandez, of Piſtoia; honoured at Rome with the lau crown, 16 Feb. 1776, in the ſame manner as Petrarca, Taſſo, and Perfetto, had been before. An account of this tranſaction, beautifully printed at Parma, by Bodoni, in 1779, contains her diploma and all the diſcourſes, poems, ſonnets, &c. written on the occaſion, with the examination which ſhe underwent, concerning her knowledge of the moſt important ſubjects upon which ſhe was required to *Improviſare,* or treat extemporaneouſly, in verſe publicly at the Campidoglio in Rome. The Italian title of this narrative is, "Atti della ſolenne coronazione fatta in Campidoglio della inſigne poeteſia D-na. Maria Maddalena Morelli Fernandez Piſtoieſe, Tragli Arcadi Corilla Olimpica." Twelve members of the Arcadian academy were ſelected out of 50, publicly to examine this new edition of a *Tenth Muſe,* which has been ſo often dedicated to ladies of poetical and literary talents. Three ſeveral days were allotted for this public exhibition of poetical powers on the following ſubjects: ſacred hiſtory, revealed religion, moral philoſophy, natural hiſtory, metaphyſics, epic poetry, legiſlation, eloquence, mythology, fine arts, and paſtoral poetry.

In the liſt of examiners there appear a prince, an archbiſhop, three monſigneurs, the pope's phyſician, abati, avocati, all of high rank in literature and criticiſm. Theſe, ſeverally, gave her ſubjects, which, beſides a readineſs at verſification in all the meaſures of Italian poetry, required ſcience, reading, and knowledge of every kind. In all theſe ſevere trials, ſhe acquitted herſelf to the ſatisfaction and aſtoniſhment of all the principal perſonages, clergy, literati, and foreigners then reſident at Rome; among the latter was our ſovereign's brother, the duke of Glouceſter.

Near 50 ſonnets by different poets, with odes, canzoni, terze rime, ottave, canzonette, &c. produced on the ſubject of this event, are inſerted at the end of this narrative and deſcription of the order and ceremonials of this ſplendid, honourable, and enthuſiaſtic homage, paid to poetry, claſſical taſte, talents, literature, and the fine arts.

This renowned lady merits ſome notice as a muſician, as well as poeteſs; as ſhe ſung her own verſes to ſimple tunes with a ſweet voice, and in good taſte. She likewiſe played on the violin; but at Florence, where we ſaw and heard her, in 1770, ſhe was accompanied on the violin by the celebrated and worthy pupil of Tartini, Nardini. At this time ſhe was not more than 30; and had a pleaſing, dignified, and intelligent countenance. See in the muſic pl. No. the two airs to which ſhe ſung at Florence, extempore verſes on ſubjects given.

CORIM. See HASTA *militaris.*

CORINÆUM, in *Ancient Geography*, a promontory of Aſia Minor in Ionia; part of mount Mimas.

CORINDIUR, a town of India, on this ſide of the Ganges. Ptolemy.

CORINDUM, in *Botany*. Tourn. See CARDIOSPERMUM.

CORINE, in *Zoology*, the ANTILOPE *Corinna* of Gmelin, has very ſlender, ſhort, ſmooth, ſtraightiſh horns, bent ſlightly into the form of a lyre; the upper parts of the body are yellowiſh-tawny, the under parts white, with a duſky ſtripe along the ſides, and two lines on each ſide of the face, the upper one white and the other black. This animal, which inhabits Senegal, is leſs than a roe; the neck, body, and flanks are of a tawny-yellow colour, the inſides of the thighs and belly are white, and a dark line, along the ſides, divides the two colours; the knees are tufted with hair;

the ears are large; the horns are about ſix inches long, almoſt upright, bending a little outwards in the middle, and ſomewhat approaching at the tips, the lower parts being ſurrounded with circular wrinkles. This ſpecies reſembles the kevel in colour, ſize, ſwiftneſs, and muſky odour; but differs very much from it in the figure of the horns; though Gmelin, after Pallas, ſuſpects that it is the female of that ſpecies.

CORINEA, in *Ancient Geography*, a country of Aſia, in Armenia Major. Ptolemy places it between the ſources of the Tigris and Euphrates, and to the ſouth of Thoſpitide.

CORINEUM, a town ſituated on the ſouthern coaſt of the iſle of Cyprus, between Citium and Salamis. It was epiſcopal, and called by Hierocles, in his Notitia, Coren.

CORINIUM, a town of Albion, belonging to the Dobuni, and allowed to be Cirenceſter in Glouceſterſhire.—Alſo, an ancient town of Illyria on the Adriatic gulf; ſuppoſed to be the preſent *Cori.*

CORINTH, Corinthus, a city of Greece in the Peloponneſus, upon a gulf of the ſame name. This city was the capital of a ſmall ſtate, ſituate on the iſthmus of Corinth, having the bay of that name, now called "Golfo di Lepanto," and the iſthmus or neck of land, which joins Peloponneſus to the continent, on the north; Sicyon, on the weſt; the gulf of Saron, on the eaſt; and the kingdom of Argos, on the ſouth. Its utmoſt extent from eaſt to weſt was about half a degree, and from north to ſouth, about half that ſpace. It had no rivers of any note; but abounded with mountains, the chief of which was called "Acrocorinthium," at the foot of which the city of Corinth was built, and on the top ſtood the citadel. It was alſo famed for the fountain Pyrene, ſacred to the muſes; though others place this fountain on the hill Helicon, and moſt others again, on that of Parnaſſus.

Corinth is ſaid to have been founded by Siſyphus, the ſon of Æolus, and grandfather of Ulyſſes, about the year of the world 2490, as ſome ſay, or according to others 2500; B. C. 1507, and about ſix years before Deucalion's flood, B. C. 1503. The ancient name of this city is ſaid to have been Ephyra, which it took from a nymph of that name, reported to have been the daughter of Oceanus and Tethys, or, according to others, of Myrmex, the wife of Epimetheus, the ſon of Japetus, and brother of Prometheus. At this time it was but an inconſiderable town, though it roſe afterwards to be the metropolis of the kingdom, and one of the nobleſt and moſt opulent cities in Greece.

Corinth, the new name of this city, has been variouſly derived; ſome have deduced it from the Greek κοριϑος, *ſatiety* or *abundance*, implying the opulence of the place; but the ancient inhabitants trace the origin of the appellation to Corinthus, the ſon, as ſome have ſaid, of Jupiter, or, according to others, of Marathon, and brother of Sicyon. However, moſt authors aſcribe the name, as well as the building, or rebuilding of it, to Corinthus, the ſon of Pelops. Corinth was alſo called "Heliopolis," or the city of the Sun, probably, as Gronovius conjectures, from the ruggedneſs and barrenneſs of its ſituation and territory, for ſuch, as Strabo tells us, it really was.

Corinth, beſides the citadel already mentioned, had two port-towns, *viz.* Lecheum ſituate on the bay of Corinth, and Cenchrea on that of Samos, and connected with the city by a double wall of about 12 ſtadia or half a league in length; diſtant from the city 70 ſtadia or about 3 leagues. Theſe were the only two havens; and, indeed, the only two cities of any note, next to Corinth, that belonged to this territory. Theſe were ſo well ſituated for naval commerce, and ſo near the metropolis, that they made ample compenſation for the barrenneſs of the ſoil. Theſe two naval roads which opened a way into the Ionian and Ægean ſeas, might eaſily have gained for them a ſuperiority, if not a command, over all Greece, if this advantageous ſituation had not inclined them more to commerce than war. For their citadel being almoſt impregnable by nature, and commanding both ſeas, they could eaſily cut off all communication betwixt one half of Greece and the other; ſo that it was not without reaſon called one of the fetters of Greece. But being led by their genius and diſpoſition to improve their advantages more for navigation and commerce than for martial exploits, they became in proceſs of time ſo exceedingly opulent, that the little influence they had over the other ſtates was owing rather to their wealth than their valour. By the gradual increaſe of their opulence, partly from commerce, and partly from the influx of ſtrangers that flocked hither from Europe and Aſia, their city became at length one of the moſt conſiderable and ſplendid in Greece; being adorned with a great variety of ſumptuous buildings, ſuch as temples, palaces, theatres, porticos, cenotaphs, baths, and other edifices; all enriched with a beautiful kind of columns, capitals, and baſes, from which the Corinthian *order* took its name, together with numberleſs ſtatues executed by the moſt famous artiſts. Such indeed were its wealth, magnificence, and excellent ſituation, that it was thought by the Romans equally worthy of empire with Carthage and Capua. It would carry us far beyond our limits minutely to deſcribe even the principal edifices that adorned this famous city; but in order to enable the reader to form ſome judgment of its extent and magnificence, we ſhall recite ſome few particulars, referring to Pauſanias "in Cor." for a more ample account. We have already obſerved that this city was ſeated at the foot of a high hill, on which ſtood the citadel. To the ſouth it was defended by the hill itſelf, which is there extremely ſteep. Very ſtrong and lofty ramparts protected it on the other ſides. Its circumference was 40 ſtadia, or about 1½ league; but as the walls extended along the ſides of the hill, and ſurrounded the citadel, it might be reckoned upon the whole at 85 ſtadia or near 3¼ leagues. The road to the citadel had ſo many windings, that the ſummit could not be attained, without paſſing through an interval of 30 ſtadia. The ſituation of the citadel and its ramparts rendered it ſo ſtrong, that it could only be taken by treachery or famine. At the entrance was the temple of Venus, with the ſtatue of the goddeſs clad in brilliant armour, and accompanied by another of the god of love, and a third of the ſun, who was adored in this place before the worſhip of Venus was introduced. In the way to the citadel was a chapel dedicated to the Egyptian Iſis, and another to the Pelagian Iſis. Two others were dedicated, one to Serapis of Canopus, and the other to another Serapis. The ſpring Pyrene, where Bellerophon is ſaid to have found the horſe Pegaſus, was ornamented with ſumptuous embelliſhments, conſiſting of ſeveral caves in form of grottoes, all covered with white marble, from which the cold and limpid water of that fountain fell into a large baſon. The forum was decorated with temples and ſtatues; the theatre was a grand and beautiful edifice of white marble, in which the aſſembly of the people deliberated on affairs of ſtate, and the muſical conteſts and other entertainments were exhibited at the feſtivals. The ſtadium, or courſe, was alſo conſtructed of white marble. The temple of Neptune was a grand building; its avenue was lined on one ſide with the ſtatues of all thoſe athletæ who had won the prize at the Isthmian *games* (which ſee), and on the other with ſtately pines planted in regular rows. The temple itſelf, though not very ſpacious, was adorned with a multitude of brazen Tritons, or ſea-gods. Here were alſo the chariots of Neptune and of his wife Amphitrite, drawn by horſes covered all over with gold, except their hoofs, which were of ivory. The two deities were carved in a ſtanding poſture, and Neptune had young Palæmon riding on a dolphin by his ſide. The baſes of the chariots were likewiſe adorned with curious baſſo-relievos, and the temple itſelf with a multitude of other embelliſhments. Diana of Epheſus was alſo exhibited in a public place together with two gilt wooden ſtatues of Bacchus. Fortune alſo had a temple, and her ſtatue was made of Perſian marble; and near this temple was that which was dedicated to the mother of all the gods. There were ſeveral other ſtatues; among which we may ſelect an Apollo, ſurnamed Clarius, in bronze; a Venus by Hermogenes of Cythera, two Mercuries, three ſtatues of Jupiter, a Minerva in bronze, mounted on a pedeſtal, the baſſo-relievos of which repreſented the Muſes. The city of Corinth abounded with public baths, the number of which was augmented by the emperor Adrian; but thoſe of Neptune, conſtructed by Eurycles of Sparta, were the moſt famous. The temple of Venus at Corinth is ſaid by Strabo to have been ſo rich, that it maintained more than 1000 courtezans, who were devoted to her ſervice, and which drew hither a multitude of ſtrangers. The feſtivals of the Aphrodiſia were celebrated in this city by harlots, as we learn from Athenæus (Deipnos. l. xiii. c. 6.); who alſo informs us, that they who ſupplicated the goddeſs Venus, promiſed to dedicate ſome females to her rites, and they obtained what they requeſted.

At firſt the commerce of Greece was carried on by land, and entered or left the Peloponneſus by the road of the iſthmus. The Corinthians took occaſion to impoſe a duty on the tranſit of all commodities, and derived from this duty a certain degree of opulence. In order to avoid the dangers of the ſea, proverbially ſtormy, between the iſle of Crete and Cape Malea in Laconia, merchants choſe to tranſport their goods to the ſeas terminating at the iſthmus. Thus, the merchandize of Italy, Sicily, and the weſtern nations, was landed at the harbour of Lecheum; and that from the iſlands of the Ægean ſea, the coaſts of Aſia Minor, and of the Phœnicians, at the port of Cenchrea. In proceſs of time, commodities were conveyed by land from one harbour to the other, and means contrived for tranſporting even the veſſels. Corinth, having thus become the mart of Aſia and Europe, continued to collect duties on foreign merchandize, covered the ſea with ſhips, and formed a navy to protect her commerce. Her induſtry was excited and encouraged by ſucceſs; ſhe built ſhips of a new form, and firſt produced (triremes) gallies, with three branches of oars. Her naval force procured her reſpect; all nations poured their productions into her emporium. The ſea was covered with reams of paper, and ſailcloth, brought from Egypt, ivory from Libya, the leather of Cyrene, incenſe from Syria, Phœnician dates, Carthaginian carpets, corn and cheeſe from Syracuſe, pears and apples from Euboea, Phrygian and Theſſalian ſlaves, together with a multitude of other articles which were continually brought into the ports of Greece, and particularly into thoſe of Corinth. The games of the iſthmus alſo drew together to this city a prodigious number of ſpectators. Theſe reſources increaſing the wealth of the ſtate, workmen of every kind were protected, and exerted themſelves with new emulation.

Corinth abounded not only with warehouſes, but with manufactures of her own. Among other articles, the inhabitants made coverlets for beds, which were much ſought after by foreign countries; ſhe alſo collected a great number of the pictures and ſtatues of the beſt maſters. Her manufactures of braſs and earthen ware were held in great eſtimation. Although Corinth poſſeſſed no copper-mines, her workmen contrived, by mixing that which ſhe received from foreign countries, with a ſmall quantity of gold and ſilver, to compoſe a metal extremely brilliant, and almoſt proof againſt ruſt. (See Æs.) Of this they made cuiraſſes, helmets, ſmall figures, cups, and veſſels; no leſs eſteemed for the workmanſhip than for the material, which were enriched with foliage and other chaſed ornaments. Thoſe on their pottery were equally beautiful.

The women of Corinth were admired for their beauty, and the men were diſtinguiſhed by their love of gain, and of licentious pleaſure. Venus was their principal deity; and the courtezans conſecrated to her ſervice, attended, in the time of public calamities and imminent danger, at the ſacrifices, and walked-in proceſſion with the other citizens, ſinging ſacred hymns. The Corinthians, indeed, were ſo much devoted to traffic and luxury, that they very much neglected the encouragement of the liberal arts and ſciences, and alſo of that thirſt for glory and conqueſt, ſo much valued by their neighbours. Nevertheleſs, they cultivated a good diſcipline, both in peace and in war; and this their opulence, with its effects on their diſpoſition and conduct, rendered abſolutely neceſſary. Though they ſeldom, if ever, engaged in war, with a view of enlarging, but chiefly for the purpoſe of defending their territories, protecting ſome neighbouring ſtate, or maintaining the liberty of Greece; yet this ſmall kingdom furniſhed many brave and experienced officers to the other Grecian cities, who were frequently preferred to their own generals. The Corinthians were, in reality, the greateſt aſſertors of liberty; and though they remained for ſome centuries under a monarchical government, yet they always manifeſted an averſion from tyranny, and an inclination to aſſiſt thoſe who were oppreſſed.

We have already obſerved, that Siſyphus was ſuppoſed to be the founder of the Corinthian monarchy; which is ſaid to have continued in the lineal ſucceſſion of his family, for ſeven or eight generations; till it became extinct, or till it was expelled the kingdom by Alethes, one of the Heraclidæ, about thirty years ſubſequent to their return, about B. C. 1074, in whoſe family the kingdom of Corinth remained for a long interval, between three and four hundred years. Royalty was at length aboliſhed, and the ſovereign power was intruſted to 200 citizens, one of whom preſided over the reſt under the appellation of "Prytanis," about the year B. C. 779. About the year 659 B. C., Cypſelus terminated this ariſtocracy, by uſurping the ſole government, and reſtored the monarchy, which he retained for about thirty years. He was ſucceeded by his ſon Periander, who held the government for 44 years. Having baniſhed his ſon Lycophron to the iſland of Corcyra, the capital of which had been built by the Corinthians, in the year B. C. 703, Periander was reduced to the neceſſity of recalling him, but his propoſals were received by the exiled ſon with indignation. He finally, however, reſolved to abdicate the crown, and confine himſelf to Corcyra, whilſt his ſon, quitting that iſland, aſſumed the reins of government at Corinth. But the Corcyreans, dreading the arrival of Periander, defeated this project by putting Lycophron to death. Tormented by impotent rage, Periander died at 80 years of age, after a reign of 44 years. As ſoon as he had cloſed his eyes, the Corinthians deſtroyed every monument, and even the ſlighteſt traces of tyranny. His ſucceſſor reigned only three years; and after this ſhort interval, the Corinthians, joining their troops to thoſe of Sparta, eſtabliſhed a government which ſubſiſted for a long period, and which approached nearer to an oligarchy than a democracy, as no affairs of importance were ſubmitted to the arbitrary deciſion of the multitude. In the year 439 B. C. a war commenced between Corinth and Corcyra; and in the year 435 B.C. the Corinthians were defeated at ſea by the Corcyreans, aided by the Athenians. And this conteſt between Corinth and Corcyra, brought on the Peloponneſian war. In the year 395 B. C. the Athenians, Thebans, Argives, and Corinthians, formed an alliance againſt the Lacedæmonians, and this gave occaſion to the Corinthian war. For an account of the aſſiſtance which Corinth afforded to the Syracuſans, ſee the article Timoleon. By the peace of Antalcidas B.C. 387, the Corinthians were obliged to withdraw their garriſon from Argos, which then became free and independent. When Alexander entered Babylon, the Corinthians ſent ambaſſadors to offer him the freedom of their city; and after firſt treating the offer with contempt, he was afterwards induced to accept it with joy, when he was told, that this honour had been conferred only on Hercules. When Aratus of Sicyon, prætor of the Achæans, had taken poſſeſſion of the citadel of Corinth, B. C. 243, the Corinthians were prevailed upon to enter into the Achæan league; and about the ſame time they iſſued a decree, that the Romans ſhould be admitted to celebrate the Iſthmian games, with the ſame privileges as the Greeks. At a ſubſequent period, B. C. 146, they inſulted the Roman deputies, commiſſioned by Metellus to appeaſe the troubles occaſioned in Peloponneſus by the Achæan league; but upon the arrival of the conſul Mummius, Corinth was beſieged; and after the defeat at the battle of Leucopetra, the conſul entered the city, and abandoned it to be plundered by the ſoldiers. All the men who were left in it were put to the ſword, and the women and ſlaves ſold; and after the ſtatues, paintings, and richeſt moveables, were removed, in order to their being carried to Rome, the houſes were ſet on fire, and the whole city was conſumed. From that time the Corinthian braſs, which was in reputation long before, became yet more famous; for it is pretended, that the gold, ſilver, and braſs, which were melted, and which ran together in this conflagration, formed a new and precious metal. The walls were afterwards demoliſhed, and raſed to their very foundations. This dreadful calamity was inflicted by order of the ſenate, for puniſhing the inſolence of the Corinthians, who had violated the law of nations, in their treatment of the ambaſſadors ſent to them by Rome. The booty taken at Corinth was ſold, and it produced a conſiderable ſum; no part of which Mummius reſerved for himſelf, but conſigned the whole to Rome, for the purpoſe of being laid out in adorning the city. Amongſt the paintings, it is ſaid there was a piece drawn by Ariſtides, the moſt celebrated painter in Greece, which repreſented Bacchus; the beauty of which was not known to the Romans, for Polybius had the mortification to ſee it uſed by the ſoldiers as a table, upon which they played at dice. In the ſale of the booty, it was adjudged to Attalus for 600,000 ſeſterces, or about 3625 *l.* ſterling. Many other ſtatues and paintings of the moſt excellent maſters, preſerved in the wreck of Corinth, were tranſported to Rome. Upon Polybius's return into Peloponneſus, he had the painful and mortifying ſight of the deſtruction and burning of Corinth, and the affliction of finding his country reduced into a province of the Roman empire. Corinth remained in a ruined and deſolate ſtate for many years. At length Cæſar, after he had ſubdued Africa, and whilſt his fleet lay at anchor at Utica, gave orders for rebuilding Carthage; and ſoon after his return to Italy, he likewiſe cauſed Corinth to be rebuilt. Strabo and Plutarch agree in aſcribing the rebuilding of Carthage and Corinth to Julius Cæſar; and Plutarch remarks this ſingular circumſtance with regard to theſe two cities, that as they were taken and deſtroyed in the ſame year, they were rebuilt and repeopled at the ſame time. Under the eaſtern emperors, Corinth was the ſee of an archbiſhop, ſubject to the patriarch of Conſtantinople. Roger, king of Naples, obtained poſſeſſion of it under the empire of Emanuel. It had afterwards its own ſovereigns, who ceded it to the Venetians, from whom it was taken by Mahomet II., in the year 1458. The Venetians retook it in 1687, and held it till the year 1715, when they loſt it to the Turks, in whoſe poſſeſſion it has remained ever ſince.

Corinth, in *Modern Geography*, *Corinto*, or *Coranto*, a town of Greece, in the Morea, ſituated near a narrow iſthmus of the ſame name, which joins the Morea to the reſt of Greece, between the gulf of Lepanto and that of Engia. It was formerly, as we have ſhewn in the preceding article, a very rich and powerful city. At preſent it contains about 13 or 14 hundred inhabitants; each houſe has a garden, planted with orange and other fruit trees. It is 46 miles E. of Athens or Atini, and 342 S.W. of Conſtantinople. N. lat. 38°. E. long. 22° 50′.

Corinth, a townſhip of America, in Orange county, in Vermont, W. of Bradford, containing 578 inhabitants.

Corinth, *Iſthmus of*, in *Ancient Geography*, the neck of land which joins Peloponneſus (the preſent Morea) to the upper part of Greece, and which is computed to be about ſix miles wide. As this forms an obſtacle to the paſſage from the Ionian to the Ægean ſea, it has been frequently propoſed to dig a canal through it, forming a junction between theſe ſeas, and thus preventing the circumnavigation of the Peloponneſus. Pliny, who mentions this project, and who, without being ſuperſtitious, repreſents it as a raſh attempt, alleges the unhappy end of four princes who ſet about it, *viz.* Demetrius of Phalera, Julius Cæſar, Caligula, and Nero. When Nero undertook this buſineſs, ſuperſtition diſcouraged the attempt; and it was ſaid, that, at the firſt ſtroke into the earth, blood guſhed out, that groans iſſued from the ſubterranean caverns, and that phantoms had appeared to the inhabitants of thoſe parts. Nero, however, deſpiſed theſe idle tales, and determined to proceed. He encouraged the Pretorian ſoldiers in their work by perſonal aſſiſtance, and flattering hopes of ſucceſs. The number of workmen whom he collected from all parts, and from all the gaols in the empire, was immenſe; and Veſpaſian, as Joſephus informs us, furniſhed him with 6000 Jews, ſelected from a much greater number whom he had impriſoned. The work was begun on the ſide next the Ionian ſea, at the port called Lecheum, and in 75 days an interval of four ſtadia was dug; and this was about the tenth part of the breadth of the iſthmus. On the laſt of theſe days, Nero ſent an order to diſcontinue the work. Two reaſons were alleged for this change of opinion and purpoſe. By ſome it was ſaid, that certain Egyptian mathematicians, whom the emperor had conſulted, having taken the level of the two ſeas, eaſt and weſt of Peloponneſus, found the waters of the Ionian higher than thoſe of the Ægean ſea; ſo that there was ground for apprehending that, if a communication were opened by a canal acroſs the iſthmus, the iſland of Ægina, and the low lands on the ſide of the Ægean ſea, would be overflowed and deſtroyed. But this allegation is a mere pretence; becauſe theſe two ſeas do actually communicate ſouth of Peloponneſus, and therefore their waters muſt be on a level. Conſidering the pertinacious temper and extreme vanity of Nero, it is very probable that he would have perſiſted, notwithſtanding every objection of mathematicians, if he had not been alarmed by reports from Italy, where diſturbances aroſe in conſequence of his abſence, and which made it neceſſary for him to return, ſo that he abandoned his enterpriſe. The news of a conſpiracy at Rome terrified him exceedingly, and haſtened his return. For an account of the games celebrated on this iſthmus, ſee Isthmian *Games*.

Corinth, *Gulf of*, now the *gulf of Lepanto*, commencing, as ſome of the ancients have ſaid, at the iſles called *Oxiæ*, having to the N. the mouth of the river Achelous and the Echinades, and to the S. the promontory called "Araxum Promontorium;" but, according to others, the gulf of Corinth denotes that portion of water forming a ſtrait to the S. by the point called "Rhium," and to the N. by that called "Anti-Rhium." This gulf extends eaſtward as far as Bœotia. In the interior part, it forms two ſmall gulfs; the one, advancing to the N., between parts of the Locride and Phocide territories, called, after the town of Criſſa to the N.E., "Criſſæus Sinus;" the other was formed by the moſt eaſtern part of the gulf, and was called "Alcyonium Mare."

CORINTHIAN Brass. See Æs *Corinthium*.

Corinthian *Order*, in *Architecture*. This is generally enumerated as the third of the Grecian orders, and forms the ultimate term of richneſs and elegance proper to that ſtyle of architecture.

The Corinthian order is principally diſtinguiſhed by its capital, which may be deſcribed as conſiſting of a bell-ſhaped body, covered with an abacus of a quadrilateral plan, with convex ſides; two tiers of leaves ſurround the lower part of the capital, between which little ſtalks or caulicoli riſe up to the corners of the abacus, and thoſe bending over form four volutes, and other volutes or ornaments occupy the centre of each ſide. Conſiderable varieties occur in ancient buildings; but this may be taken as a general analyſis, which will include all Corinthian capitals.

The account, given by Vitruvius, of the origin of this order, has been already detailed in the article *Civil* Architecture. It muſt, however, be obſerved, that the Egyptian buildings preſent many capitals of a bell-form, decorated with leaves, which bear a ſufficient reſemblance to the Corinthian capital, to juſtify a ſuſpicion that this compoſition may have been derived from the imitation of an Egyptian model.

Callimachus, to whom the invention of the Corinthian capital is attributed, is ſuppoſed to have lived about the 60th Olympiad, or 540 years before the Chriſtian æra, which would give a very high antiquity to this order; but the firſt diſtinct account we have been able to find of its introduction in any building, is the following from Pauſanias, l. viii. The ancient temple of Minerva at Tegea, in Arcadia, having been deſtroyed, a ſecond edifice was erected, under the direction of Scopas, far exceeding in ſplendour and magnificence every building of the kind in the Peloponneſus. In this ſtructure the three orders of architecture were employed. Within the encloſure were galleries ſupported by Doric and Corinthian columns, ſurrounding the hypætheos or open area of the cella; and on the outſide of the temple were porticoes of the Ionic order. This building may be dated in the fourth century B.C. To judge from the extant remains of this order in Greece, which are comparatively neither numerous nor important, we ſhould ſay, that it had never obtained a degree of favour equal to the other two orders; but in the buildings of Rome, and in works in other countries under Roman influence and direction, quite the contrary is the caſe; and it is to theſe ſources that we are to look for the beſt examples of the Corinthian order.

Vitruvius, l. 3. c. 1. in treating of this order, obſerves that Corinthian columns, excepting in their capitals, have their ſymmetry the ſame as the Ionic; but the height of the capital renders them proportionally taller, and more graceful: for the height of the Ionic capital is only a third part of the thickneſs of the column, whereas that of the Corinthian is the whole diameter of the ſhaft. The other members, which are placed above the column, are taken from the Doric or Ionic orders; for the Corinthian has no entablature peculiar to itſelf, but has either triglyphs, mutules in the cornice, and guttæ in the epiſtylium, as in the Doric manner; or elſe, according to the Ionic diſpoſition, the freize is ornamented, and dentils are placed in the cornice: ſo that by theſe two orders, joined with a different capital, a third order is produced.

The preceding obſervation of Vitruvius, that the Doric entablature was ſometimes applied to Corinthian columns, is in itſelf very extraordinary, and is not ſupported by any antique examples; but the remark reſpecting the Ionic entablature is found to be ſtrictly true in a number of inſtances, as we ſhall proceed to ſhew by the deſcription of the following examples:

A temple at Jackly, near Mylaſa. In this building there is a cornice, with dentils, a ſwelled freize, an architrave, with three plain facias, and an Attic baſe.

The arch of Adrian at Athens. A cornice, with dentils, a plain freize, an architrave, with two plain facias, and an Attic baſe.

A building called the Incantada at Salonicha, the ancient Theſſalonica. A cornice, with dentils, a ſwelled freize, ornamented with flutings, an architrave, with three plain facias, an Attic baſe.

The temple of Veſta at Tivoli. A plain cornice, with uncut dentil-band, an ornamented freize, an architrave, with two plain facias, and an Attic baſe.

The temple of Antoninus and Fauſtina at Rome. A plain cornice, with uncut dentil-band, ornamented freize, an architrave of two facias, divided by an Aſtragal, and an Attic baſe.

The portico of Septimius Severus at Rome. A plain cornice, with a ſmall uncut dentil-band, a plain freize, an architrave of three facias, divided by mouldings.

In all theſe inſtances, the entablature and baſe are entirely ſimilar to thoſe commonly obſerved in the Ionic order, from which thoſe Corinthian examples only differ in the form of the capital; but in the examples which remain to be cited, it will appear that the Romans attempted to give the Corinthian order a more diſtinct character, by appropriating to it a peculiar entablature and baſe, and thus made a complete order of what might be previouſly regarded, as Vitruvius appears to conſider it, in the light of a compoſite invention.

The Portico of the Pantheon. A cornice, with modillions, and an uncut dentil-band, a plain freize, an architrave of two facias, divided by mouldings, and a Corinthian baſe.

The temple of Peace at Rome. A cornice, with modillions and dentils, a plain freize, and an architrave of three facias, divided by mouldings.

The three columns of the Campo Vaccino, ſuppoſed to belong to a temple of Jupiter Stator. A cornice, with modillions and dentils, a ſtraight freize, an architrave of three facias, divided by mouldings, and a Corinthian baſe.

The temple of Jupiter Tonans at Rome. A cornice, with modillions and dentils, a ſtraight freize, and an architrave of three facias, divided by mouldings.

The arch of Conſtantine. A cornice, with modillions and dentils, a plain freize, an architrave of three plain facias, and an Attic baſe.

A temple at Epheſus, ſuppoſed by Chandler to be the temple erected, by permiſſion of Auguſtus, to the god Julius. A cornice, with modillions and dentils, a ſwelled and ornamented freize, an architrave of three facias, divided by mouldings, and an Attic baſe.

The temple at Niſmes called the Maiſon Quarré. A cornice, with modillions and dentils, a ſtraight freize, an architrave of three facias, divided by mouldings, and an Attic baſe.

To render this account of the progreſſive improvement in the Corinthian order more complete and ſatisfactory, ſome inſtances may be given, in which the alteration remains imperfect, having only taken place partially, with a great reſemblance to Ionic forms.

A portico at Athens, ſuppoſed by Stuart to be the ancient Poikile. This building preſents a cornice, with mutules of two ſquare faces, an architrave, with two plain facias, and an Attic baſe.

The frontiſpiece of Nero at Rome. A cornice, with mutules of the ſame form as the laſt mentioned, an ornamented freize, and an architrave of two facias, divided by an ogee.

In theſe two inſtances, there are no dentils or dentil-bands in the cornices; and the mutules, by their ſituation and ſhape, appear rather to be a variation from the proper Ionic dentil than a new member.

Conſidering the Corinthian order in its moſt complete ſtate, we find it poſſeſſed of a peculiar entablature diſtinguiſhed from that of the other orders by a cornice with modillions and dentils, a ſtraight freize, and an architrave of three facias divided by mouldings. The column is marked by its capital, and alſo by a peculiar baſe called the Corinthian BASE. This deſcription is wholly applicable to the three columns of the campo Vaccino, which are probably the moſt complete and beautiful examples of the order extant. See *Plate* 29.

Of the modern architects, who have treated of this order, Palladio makes the column $9\frac{1}{2}$ diameters high, and gives only one-fifth part of this altitude to the entablature, which conſiſts of a cornice with modillion and dentils, a ſtraight freize, and an architrave of three facias divided by Aſtragals. The baſe is Attic. Scamozzi's deſign bears a great general reſemblance to Palladio's, but he gives ten diameters to the column. The entablature is one-fifth of this height, the cornice has modillions, only the architrave conſiſts of three facias divided by Aſtragals, and the baſe is Attic. Serlio, in his Corinthian order, has followed Vitruvius in giving it an Ionic entablature with dentils, and in the proportion of the capital. The column is nine diameters high, and has a Corinthian baſe. Vignola's is a grand and beautiful compoſition in which he has chiefly imitated the three columns. He gives the column ten diameters in height with a Corinthian baſe. The entablature is one-fourth of the height of the column, the cornice has modillions and dentils; a plain freize, and an architrave of three facias divided by mouldings.

The following Table will exhibit the proportions of ſome of the principal examples of the Corinthian order, premiſing that the different members are meaſured by the diameter at the bottom of the ſhaft; which is divided into ſixty minutes.

	Height of Column.	Height of Capital.	Architrave.	Freize.	Cornice.
Portico of the Pantheon	9D $34\frac{1}{4}'$	$67\frac{3}{4}'$	$42\frac{3}{4}'$	$39\frac{1}{2}'$	54′
Temple of Veſta at Rome - - - - - -	10D 58′	$77\frac{1}{3}'$			
Temple of Veſta at Tivoli - - - - -	9D $21\frac{1}{4}'$	57′	30′	$37\frac{1}{2}'$	$32\frac{1}{2}'$
Temple of Antoninus and Fauſtina - - -	9D $36\frac{1}{2}'$	$68\frac{3}{4}'$	$43\frac{1}{2}'$	$40\frac{2}{3}'$	$52\frac{1}{2}'$
Three Columns Campo Vaccino - - - -	10D $6\frac{5}{6}'$	$66\frac{1}{3}'$	$43\frac{1}{2}'$	$43\frac{1}{3}'$	$69\frac{5}{12}$
A Building at Rome, commonly called the Baſilica of Antoninus	10D $11\frac{3}{4}'$	$69\frac{1}{2}'$	$43\frac{1}{3}'$	$32\frac{1}{2}'$	
The Arch of Conſtantine - - - - - -	9D 37′	$65\frac{3}{4}'$	45′	40′	$58\frac{7}{12}'$
The Temple at Epheſus	10D 15′	64′	48′	$45\frac{1}{3}'$	48′
The Temple at Jackly	9D 31′	63′	$43\frac{2}{3}'$	40′	
Poikile at Athens - -	9D 32′	$64\frac{2}{3}'$	$39\frac{3}{4}'$	$34\frac{3}{4}'$	$38\frac{3}{4}'$
The Arch of Adrian at Athens - - - - -	9D 52′	72′	41′	$38\frac{3}{4}'$	46′
The Incantada at Salonicha - - - - - -	9D 31′	$66\frac{3}{4}'$	46′	$41\frac{1}{2}'$	$42\frac{1}{3}'$
Palladio - - - - - -	9D 30′	70′	38′	$28\frac{1}{2}'$	$47\frac{1}{2}'$
Scamozzi - - - - -	10D	70′	40′	32′	48′
Serlio - - - - - -	9D	60′	30′	37′	39′
Vignola - - - - - -	10D	70′	45′	45′	60′

"The Corinthian order," ſays ſir William Chambers, "is proper for all buildings where elegance, gaiety, and magnificence are required. The ancients employed it in temples, dedicated to Venus, to Flora, Proſerpine, and the nymphs of fountains; becauſe the flowers, foliage, and volutes with which it is adorned, ſeemed well adapted to the delicacy and elegance of ſuch deities." This account, though plauſible in theory, is wholly unfounded, and is, in fact, a mere modern refinement. The Romans, in borrowing their architecture from Greece, appear to have particularly appropriated the Corinthian order, they found it poſſeſſed of an ornamental character adapted to the ſplendour and magnificence of their taſte, and uſed it indiſcriminately on all occaſions, and in the temple of any deity in the ſame manner that the early Greeks uſed the Doric, and the Ionians the Ionic order. Thus the Romans erected Corinthian temples to Jupiter, Neptune, and Mars; and the Greeks built the temples of the ſame deities of the Doric order. The temples of Minerva at Athens and at Sunium are Doric; the temple of Minerva at Priene is Ionic. The temple of Jupiter Olympius at Elis, was of the Doric order; the temple of the ſame god, erected by Adrian at Athens, is Corinthian. The orders of architecture are national. Thus the numerous temples of the Grecian colonies in Sicily and Italy are uniformly Doric, marked by the moſt ſevere and maſſy ſimplicity. The cities of Ionia preſent the beſt examples of a chaſte and elegant Ionic; while the magnificent ſtructures of Balbec and Palmyra, are wholly of the Corinthian order, and in the moſt florid ſtyle of ornament.

CORINTHIANS, *Epiſtles to the*, in *Biblical Hiſtory*, are two letters, addreſſed by the apoſtle Paul to the inhabitants of

Corinth, including both Gentile and Jewiſh converts, and comprehended in the ſacred canon of the New Teſtament. Some have inferred from 1 Cor. v. 9, that the apoſtle had written another epiſtle to the church at Corinth; but Dr. Whitby (*in loc.*) obſerves, that no fathers ever aſcribed to St. Paul more than 14 epiſtles, including that to the *Hebrews;* nor does Euſebius mention any third epiſtle to the Corinthians, amongſt the true, controverted, or ſpurious writings which paſs under his name. Moreover, no Chriſtian writer ever cited any thing from this ſuppoſed epiſtle; and all the Greek ſcholiaſts declare, that the apoſtle ſpeaks in theſe words, "not of another, but of this very epiſtle," which, ſays Dr. Whitby, "is ſufficient to juſtify the verſion I have given of theſe words, I had written, or was writing, in this epiſtle." Beſides, his ſuppoſed epiſtle to Laodicea is cited as a book exploded by St. Jerom; his epiſtles to Seneca are in like manner cited by St. Jerom and St. Auſtin; the acts of Paul are cited, and rejected by Origen and Euſebius; but none of them make any mention of more than two epiſtles to the church of Corinth.

The *firſt epiſtle* was written about three years after the apoſtle had left Corinth, to preach the goſpel in other parts of Greece; and it was written at Epheſus, as appears from ch. xvi. 8, 9, 19, and Acts, xviii. 18, 19, according to Pearſon and Mill in the year 57, the third of the emperor Nero; but, according to Lardner's computation of St. Paul's times and travels, in the ſpring of the year 56, and this was alſo the opinion of Lenfant and Beauſobre. This epiſtle was written in anſwer to ſome important inquiries propoſed by the Corinthians, and for the purpoſe of correcting the various irregularities and diſorders, of which they were guilty. The firſt article under the head of abuſes, with which they were chargeable, related to the parties and factions into which they had fallen, and the oppoſition which was made by ſome of them to St. Paul's apoſtolical miſſion. The firſt four chapters comprehend this firſt head. The ſecond topic which the apoſtle conſiders was the caſe of a notorious offender in the Corinthian church, who had been guilty of moſt ſcandalous inceſt with his father's wife. (See chap. v.) The third article which the apoſtle exhibits againſt the Corinthians is, that by a covetous and litigious temper they were led, in violation of the rules of Chriſtian prudence and charity, and ſometimes in oppoſition to the principles of juſtice, to proſecute their brethren in the heathen courts. (Chap. vi. 1—11.) In the fourth place, the apoſtle cautions them againſt the ſin of fornication, to which, in their Gentile ſtate, they had been much addicted, and which ſome ſeem to have reckoned among things that were indifferent, or to conſider as of inferior enormity; introducing uſeful reflections on matters of indifference, and illuſtrating the heinous evil of fornication from views peculiar to the Chriſtian religion. (Chap. vi. 12. to the end.) As Corinth was conveniently ſituated for commerce, it abounded in riches, and was furniſhed with all the accommodations, elegancies, and ſuperfluities of life. Hence, by too natural a conſequence, the inhabitants were led into luxury, lewdneſs, and all manner of vice; ſo that they became infamous even to a proverb. Thus, Κορίνθια γυνή, a Corinthian woman, is, in the language of the ancients, a lewd proſtitute, according to the proverb (cited in Eraſm. Adag. Cent. 7. p. 633. 720.) ἆ κόρινθια ἔοικας χοιροπωλήσειν, *at Corinthia videris corpore quæſtum factura.* And Κορινθιάζειν, Κορινθιάζεσθαι, is ἑταιρεύειν, *ſcortationibus indulgere.* (Heſych. Phavor.) We have already obſerved (from Strabo) that there was in it a temple dedicated to Venus, which πλείους ἢ χιλίας ἱεροδούλους ἐκέκτητο ἑταίρας. See CORINTH.

Having thus largely, and with great fidelity and plainneſs, corrected ſome lamentable diſorders which prevailed among the Corinthians; the apoſtle proceeds to the other principal object of his epiſtle, which was to anſwer certain queſtions which they had propoſed to him. Here he determines, *firſt*, thoſe which related to the marriage-ſtate; ſtating, that in ſome circumſtances this ſtate ſhould be entered into, and continued in; but in others, foreborne, particularly at that time; and enjoining wives not to depart from their huſbands, and huſbands not to diſmiſs their wives. (Ch. vii. 1—11.) He then ſhews, that marriages were not to be diſſolved, as ſome thought they might, on account of a difference in religion; and he urges contentment with the ſtations, in which they were called, whether they were married or ſingle, bond or free. (v. 12—14.) And with regard to ſingle perſons, he aſſerts the inexpediency of their marrying in the peculiar circumſtances of the church at that juncture. (v. 25, to the end.) To the *ſecond* query propoſed, *viz.* how far they might comply with their heathen neighbours in "eating things ſacrificed to idols," he replies, by reminding them that though all Chriſtians might well be ſuppoſed to know the vanity of thoſe imaginary deities, to which the ſacrifices were offered, yet it might prove an occaſion of grief and ſcandal to ſome, if the profeſſors of Chriſtianity ſhould partake of thoſe ſacrifices in their temples; which, therefore, Charity would require them by all means to avoid. (Ch. viii.) He then, after waving, for his own part, the expectation of a maintenance from the Corinthians, ſtates the right, which, as a miniſter of the goſpel, he really had to be ſupported by thoſe among whom he laboured; and this he argues both from natural equity, and ſcripture-principles. (Ch. ix. 1, to the end.) He next reſumes the argument againſt partaking of entertainments upon "things offered to idols" in the heathen temples. (Ch. x. 1—13.) He proceeds to caution them againſt all approaches to idolatry. (v. 14, to the end, ch. xi. 1.) In reply to a *third* query, concerning the manner in which women ſhould deliver any thing in public, when urged to it by a divine impulſe, he firſt ſettles this point; he then conſiders various circumſtances relating to public worſhip, and guards againſt abuſes in the celebration of the Lord's ſupper, and alſo in the exerciſe of ſpiritual gifts; concluding with a recommendation and deſcription of mutual charity. (Ch. xi. 2, to the end, ch. xii. ch. xiii. Ch. xiv.) As ſome of the Corinthians doubted, and others denied, the reſurrection of the dead, the apoſtle eſtabliſhes this great and peculiar article of the Chriſtian faith. (Ch. xv.) He then cloſes the whole with ſome neceſſary counſels to the Corinthian churches and exhortations to fortitude and charity. (Ch. xvi.)

The *ſecond epiſtle* of St. Paul to the Corinthians was written during his ſtay in Macedonia, whither he had gone from Epheſus, ſomewhat more than a year after his former epiſtle; according to Pearſon in the year 57, and as Mill ſuppoſes near the end of that year; or, as Dr. Lardner ſuggeſts, in September or October. (Ch. ix. 1—5. ch. viii. ch. xiii. 1.) It was conveyed by Titus, who was returning to Corinth in order to forward the collection intended for the poor Chriſtians in Judea. Its evident deſign is, in general, to illuſtrate ſome of the ſame points upon which he had diſcourſed in the former, according to the information which the apoſtle had received from Titus concerning the circumſtances and temper of the Corinthian church; and the writer interſperſes and enforces ſome occaſional reflections and advices upon various ſubjects, which he thought moſt conducive to their inſtruction and edification. From a view of the epiſtle it is evident, that a great part of it is employed in reclaiming the Corinthian church from their undue attachment to Judaizing teachers, and from that party-ſpirit, which they had indulged, and in rekindling proper regards to the unadulterated doctrine of the goſpel, and to his own apoſtolical counſels. This leading deſign of the epiſtle is interrupted by the occaſional introduction of other matters, which can form no reaſonable objection to the accuracy and beauty of this excellent compoſition; for the tranſitions ariſe from ſome obvious and important ſentiments, which render them natural and juſt. In theſe digreſſions there is an admirable wiſdom; becauſe they relieve the minds of the Corinthians from that uneaſineſs, which they muſt have felt from a conſtant attention to ſo diſagreeable a ſubject as their unſuitable conduct towards the apoſtle himſelf. It is with the ſame kind of propriety and ſagacity, that the ſevere intimations, which the dignity of the apoſtolic character obliged St. Paul to drop againſt thoſe, who might perſevere in their oppoſition, are reſerved to the cloſe of the epiſtle; as they would feel with additional weight, in all probability, after their minds had been ſoftened with the reiterated expreſſions of his tender affection to the Corinthians in general, and the innocence and amiableneſs of his character had been repreſented in ſuch a variety of views. See Doddrige's Expoſition, vol. iv. Whitby's Comment. vol. ii.

We cannot cloſe this article, without referring to ſome pertinent and judicious remarks, made by archdeacon Paley, in his "Horæ Paulinæ," (an excellent work of original criticiſm and reaſoning,) on the undeſigned agreement or conformity that is manifeſt between theſe letters of St. Paul to the Corinthians, and the hiſtory of his life and travels in the book of Acts.

As it appears, from chap. vii. v. 1. that the firſt epiſtle was written to the Corinthians, in anſwer to one which he had received from them, this alone is a circumſtance that favours the authenticity of the epiſtle:—for it muſt have been a far-fetched contrivance in a forgery, firſt to have feigned the receipt of a letter from the church of Corinth, which letter does not appear; and then to have drawn up a fictitious anſwer to it, relative to a great variety of doubts and inquiries, purely economical and domeſtic; and which, though likely enough to have occurred in an infant ſociety, in a ſituation and under an inſtitution ſo novel as that of a Chriſtian church then was, it muſt have very much exerciſed the author's invention, and could have anſwered no imaginable purpoſe of forgery, to introduce the mention of at all. Particulars of this kind are ſuch as follow:—the rule of duty and prudence relative to entering into marriage, as applicable to virgins, to widows—the caſe of huſbands married to unconverted wives, of wives having unconverted huſbands—the caſe where the unconverted party chuſes to ſeparate, when he chuſes to continue the union—the effect which their converſion produced upon their prior ſtate, of circumciſion, of ſlavery—the eating of things offered to idols, as it was in itſelf, as others were affected by it—the joining in idolatrous ſacrifices—the decorum to be obſerved in their religious aſſemblies, the order of ſpeaking, the ſilence of women, the covering or uncovering of the head, as it became men, as it became women. Theſe ſubjects, with their ſeveral ſubdiviſions, are ſo particular, minute, and numerous, that though they be exactly agreeable to the circumſtances of the perſons to whom the letter was written, nothing but the exiſtence and reality of theſe circumſtances could have ſuggeſted to the writer's thoughts. Another particular deſerving of notice is, that in this correſpondence the Corinthians did not ſay one ſyllable about the enormities and diſorders which had crept in among them, and in the blame of which they all ſhared; but that the apoſtle's information, concerning the irregularities then prevailing at Corinth, had come round to him from other quarters. (Ch. i. 11, 12. v. 1, 2.) That the Corinthians ſhould, in their own letter, exhibit the fair ſide of their conduct to the apoſtle, and conceal from him the faults of their behaviour, was extremely natural, and extremely probable; but it was a diſtinction which would not have eaſily occurred to the author of a forgery; and much leſs likely is it, that it ſhould have entered into his thoughts to make the diſtinction appear in the way in which it does appear, *viz.* not by the original letter, not by any expreſs obſervation upon it in the anſwer, but diſtantly by marks perceivable in the manner, or in the order, in which St. Paul takes notice of their faults. For the particular traces of unintended and ſeemingly accidental coincidence between the facts that are recited in the two epiſtles, and thoſe that may be collected from the hiſtory, and which is altogether irreconcileable with a premeditated impoſture or forgery, we muſt refer the reader, converſant with ſubjects of this kind, and deſirous of farther information, to the work already cited, p. 72—151.

We may here obſerve, that there is another epiſtle of St. Paul to the Corinthians, beſides the two above mentioned, purporting to be an anſwer to an epiſtle from the Corinthians to him. This was tranſlated by Scroderus, from a copy in the Armenian language, which had been ſent to Mr. Whiſton, and was afterwards, from a more perfect copy procured at Aleppo, publiſhed by his ſons, as an appendix to their edition of Moſes Chorenenſis. No Greek copy exiſts of this epiſtle: it is not only unſupported by ancient teſtimony, but negatived and excluded; as it has never found admiſſion into any catalogue of apoſtolical writings, acknowledged by, or known to, the early ages of Chriſtianity. This epiſtle is an artful and ſpecious forgery, introduced with a liſt of names of perſons who wrote to St. Paul from Corinth, and preceded by an account, ſufficiently particular, of the manner in which the epiſtle was ſent from Corinth to St. Paul, and the anſwer returned. But they are names which no one ever heard of, and the account it is impoſſible to combine with any thing found in the Acts, or in the other epiſtles.

CORINTHUS, in *Ancient Geography*, a town of Greece, in Theſſaly.—Alſo, a town of Greece, in Epirus.

CORIO, in *Geography*, formerly a town of Piedmont, in Italy, belonging to the king of Sardinia, is now a town of France, in the department of the Po, chief place of a canton, in the diſtrict of Turin, containing 5132 inhabitants. The canton is compoſed of 5 communes, and reckons in all 6764 inhabitants.

CORIOLANO, Christofano, in *Biography*, a deſigner and engraver in wood, who is ſaid to have been a native of Nuremberg, but who afterwards eſtabliſhed himſelf at Venice. Heinecken conjectures that his real name was that of *Lederer*, a family ſtill exiſting in Saxony, and which Chriſtofano might tranſlate into Coriolano, according to the cuſtom of thoſe times.

Vaſari informs us, in his Life of Marc Antonio, that Chriſtofano engraved, from the deſigns of himſelf and his ſcholars, all the portraits prefixed to the lives of the different painters, ſculptors, and architects, in his extenſive work; and that he continued to enjoy the reputation of an excellent artiſt at Venice, where he was eſtabliſhed. If ſo, Chriſtofano Coriolano cannot have been born ſo late as 1560, which M. Huber ſuppoſes. Beſides the prints for Vaſari, many of thoſe in the *Ars Gymnaſtica Hieronymi Mercurialis*, the work of Ulyſſes Aldrovandini, are attributed to this maſter. But it is probable there were two artiſts of the ſame name. Huber.

Coriolano, Cav^{r}. Bartolommeo, ſuppoſed the ſon of the preceding artiſt, was born at Bologna, about 1590, and is ſaid to have perfected himſelf in deſign by ſtudying in the academy of Caracci. Guido, however, ſeems to have been the painter he moſt admired; and we are indebted to Bartolommeo for ſeveral excellent engravings in chiaro-ſcuro, from the drawings of that graceful painter. Theſe prints were produced, like thoſe of Ugo de Carpi and Andrea Andreani, by means of three blocks of wood; one of which gave the outlines and the greateſt depths of ſhadow, as if hatched with a pen; the ſecond, the middle tints; and the third, the darker maſſes. He flouriſhed from 1620 to 1650. His prints are generally ſigned with his name, or with his initials, thus, B. C. Eques.

Amongſt his beſt prints are the following: "St. Jerome before a Crucifix," a half-length figure, dated 1636, after Guido; "the Daughter of Herodias, with the Head of John the Baptiſt," from the ſame; "the Fall of the Giants," a large upright print on four ſheets, from the ſame painter, dated 1647, and conſidered the chef d'ouvre of Coriolano. Heinecken. Huber.

Coriolano, Gio. Batista, the younger brother of Bartolommeo, was born at Bologna, about 1596, and ſtudied painting and deſign under Gio. Luigi. Valeſio. Some of the pictures of Gio. Batiſta exiſt in the churches of St. Anna and the Annonciata, at Bologna. He is better known by his numerous engravings in wood and copper, the former of which are preferred by the connoiſſeurs.

We ſhall only notice the following prints by this artiſt, who is ſaid to have died in 1649: "the Portrait of Fortunatus Licetus," 1639, in 4to.; "Chriſt crowned with Thorns," a middling-ſized upright plate, boldly etched from Lod. Caracci. Huber.

Coriolano, Teresa Maria, ſiſter to the two preceding artiſts, after having acquired ſufficient knowledge of deſign from the inſtructions of her father, ſtudied painting under Elizabetta Sirani. She alſo amuſed herſelf with etching, as appears by a ſmall print repreſenting the Virgin and Child. Huber.

CORIOLANUS, **Caius Marcus**, celebrated in Roman hiſtory, was deſcended from the family of the Marcii, and in his early years he diſplayed uncommon courage and nobleneſs of mind, united with ſtrong paſſion and the pride of high birth. He firſt diſtinguiſhed himſelf in the war againſt Tarquin, who was expelled; and obtained a civic crown, for having preſerved the life of a fellow-citizen. For his ſucceſs over the Volſcians, he was preſented with a fine horſe richly capariſoned, and a tenth part of the ſpoil. The former he accepted, but diſdained a greater ſhare of the booty than fell to his lot in common with others of the ſame rank. As a further favour, he demanded the releaſe of a Volſcian priſoner, who had been connected with him by the tie of friendſhip, which was immediately granted; and the ſurname of Coriolanus was unanimouſly conferred upon him, on account of his great ſervices in the capture of Corioli, the capital of the Volſcians, which happened in the year 493 B. C. About this time diſſenſions prevailed between the patricians and plebeians: Coriolanus ſided with the former, and was exceedingly ſevere againſt the plebeians. For ſome of his meaſures he was ſummoned before the tribunes, to which he paid no attention, till he conceived the ſafety of the ſtate required him to come forward in his own juſtification. Inſtead, however, of ſoftening the reſentment of the people by ſubmiſſion, he aggravated their diſpleaſure by the haughtineſs of his behaviour. He was now condemned to be thrown from the Tarpeian rock; but from this ſevere puniſhment he was ſaved by the courage of the patricians, in whoſe cauſe he had embarked. He was at length tried by the people, to whom he appealed by the ſcars he had received in fighting for his country, and by the lives he had ſaved in battle; but the tribunes ſucceeded in obtaining againſt him a ſentence of perpetual baniſhment. He heard the decree without emotion, and with a manly compoſure took leave of his mother, his wife, and children; but the ingratitude of his country made an indelible impreſſion on his mind. He was bent on revenge: he joined with the enemies of Rome, took many of the towns, and encamped within five miles of the city itſelf. The people now ſaw their error, and a deputation was ſent out to treat with him: he received them with haughtineſs, but would give them no hopes of a reconciliation. To a ſecond and third meſſage of the ſame kind he ſhewed himſelf inexorable. At length, his mother, wife, and children, came out to plead their country's cauſe. To their intreaties he could no longer refuſe his ear. Raiſing his venerable parent from the ground, on which ſhe had proſtrated herſelf, he exclaimed, "You have ſaved Rome, my mother, but you have deſtroyed your ſon." He retired to his tent, and ſoon after took meaſures for a retreat. When he had brought back the troops to the Volſcian country, he divided all the booty among the ſoldiers; on which account he ſo ingratiated himſelf with the men, that his own want of reſolution was forgotten. By ſome of the hiſtorians we are told he lived to a great age; though others maintain that he was ſlain in a tumult, excited againſt him for yielding to the prayers of his country. Plutarch.

CORIOLLA, **Corioli**, in *Ancient Geography*, a town of Italy, ſituated in the country of the Volſci, of which it was the metropolis. From this town, which no longer ſubſiſted in the time of Pliny, Marcius took the name of *Coriolanus*.

CORIOS, a river of Aſia, towards Carmania.

CORIOTRAGEMATODENDRON, in *Botany*, Pluk. See **Myrica** *quercifolia*.

CORIOVALLUM, in *Ancient Geography*, a town of Belgic Gaul, on the route from Colonia Trajana, between Teudurum and Juliacum. Anton. Itin.

CORIS, in *Botany*, (κορις; Dioſc.) Tourn. 652. Append. Linn. gen. 243. Schreb. 329. Willd. 374. Lam. Ill. 292. Juſſ. 96. Vent. 2. 288. Claſs and order, *pentandria monogynia*. Nat. Ord. *Lyſimachiæ*, Juſſ. *Primulaceæ*, Vent.

Gen. Ch. *Cal.* one-leafed, ventricoſe, five-toothed, crowned externally with ſtrong ſharp briſtles. *Cor.* monopetalous, irregular; tube the length of the calyx, cylindrical; border flat, five-parted; ſegments oblong, obtuſe, emarginate, unequal. *Stam.* five, briſtle-ſhaped, ſhorter than the corolla, declining; anthers roundiſh. *Piſt.* Germ ſuperior, roundiſh; ſtyle filiform, the length of the ſtamens; ſtigma ſimple. *Peric.* Capſule globular, placed at the bottom of the calyx, one-celled, five-valved. *Seeds* numerous, ſomewhat egg-ſhaped, ſmall.

Eſſ. Ch. Calyx ventricoſe, with thorn-like teeth. Corolla monopetalous, irregular. Capſule five-valved, included in the calyx.

Sp. C. *monſpelienſis*. Linn. Sp. Mart. Lam. Ill. Pl. 102. Willd. (C. cærulea maritima; Bauh. Pin. 280. Symphytum petræum; Cam. Epit. 699.) *Root* perennial. *Stems* ſeveral, about ſix inches high, more or leſs erect, cylindrical, branched, cinereous, or reddiſh. *Leaves* ſcattered, numerous, ſmall, linear; the upper ones in the wild plant edged with ſharp prickly teeth. *Flowers* red or white, in denſe, egg-ſhaped, terminal ſpikes. A native of ſandy ſhores in the ſouth of Europe.

Coris *lutea*; C. Bauh. See Hypericum *coris*.

Coris is alſo uſed in the Eaſt Indies for a kind of ſhells which paſs for money. See Bia and Cowry.

CORISCO, in *Geography*, two iſlands of that name on the coaſt of Guinea, belonging to Benin.

CORISPERMUM, in *Botany*, (from κορις, *a bug*, and σπερμα, *ſeed*.) Linn. Gen. 12. Schreb. 16. Willd. 26. Gært. 469. Lam. Illus. 12. Juſſ. 86. Vent. 2. 261. Claſs and order, *monandria digynia*. Nat. Ord. *Oleraceæ*, Linn. *Atriplices*, Juſſ. *Chenopodæ*, Vent.

Gen. Ch. *Cal.* none; Linn. Schreb. Willd. (two-leaved; leaves oppoſite, compreſſed, acuminate, incurved; Lam. Juſſ. Vent. Gært.) *Cor.* dipetalous; Linn. (none, Lam.) *Stam.* Filament one, but in the lower flowers often from two to five, filiform; anther roundiſh. *Piſt.* Germ ſuperior, egg-ſhaped, compreſſed; ſtyles two, capillary (one; Gært.) ſtigmas acute. *Peric.* none. *Seed* ſingle, oval, compreſſed, flat or a little concave on one ſide, convex on the other, with an acute margin.

Eſſ. Ch. Calyx or corolla two-leaved, or two-petalled, one of them wanting. Seed ſingle, elliptical, plano-convex, with an acute margin.

Sp. 1. C. *hyſſopifolium*. Linn. Sp. Pl. 1. Mart. 1. Lam. 1. Willd. 1. Lam. Illus. Pl. 5. "Flowers lateral; bractes like the leaves, linear, ſmooth underneath." *Root* annual. *Stem* ſcarcely a foot high, pubeſcent towards the top, reddiſh beneath, ſtriated, branched. *Leaves* alternate, entire, with a white longitudinal nerve, and ſomewhat membranous edges; lower ones two inches long, about a line broad, ending in a long point, diminiſhing gradually towards the top of the ſtem, without aſſuming the form of bractes. *Flowers* axillary within the upper leaves, ſeſſile. *Seeds* emarginate. A native of Ruſſia and the ſouth of France. 2. C. *ſquarroſum*. Linn. Sp. 2. Mart. 2. Lam. 2. Willd. 2. "Spikes lateral and terminal, ſquarrous; bractes egg-ſhaped, ſhort, mucronate, ſomewhat villous." *Root* annual. *Stem* a foot high or more, much branched, panicled, zigzag, cylindrical, almoſt ſmooth, greeniſh, with purple ſtriæ; lower branches almoſt decumbent. *Leaves* about two inches long, alternate, linear, ſmooth, nearly equally diſtant from each other. *Spikes* an inch long or more; bractes very different from the leaves, with white membranous edges; flowers ſeſſile. *Seeds* not emarginate. A native of Tartary and Siberia. There is a variety, perhaps a diſtinct ſpecies, found in the ſouth of France, with weaker ſtems and more ſlender generally terminal ſpikes. 3. C. *orientale*. Lam. 3. "Leaves long, narrow, linear; flowers ſomewhat panicled, growing only at the ends of the branches." *Root* annual. *Stems* about a foot high, ſlender, reddiſh at the baſe, branched. *Leaves* narrowing towards the baſe. *Bractes* ſmall, oblong, villous. A native of the Levnat.

Corispermum *foliis oppoſitis*; Fl. lap. Gron. See Callitriche.

CORITA, in *Geography*, a town of Spain, in the province of Leon; 17 miles S.S.W. of Leon.

CORITANI, or Coriceni, inhabitants of ancient Albion, were ſituated to the W. and N. of the Iceni, and, according to Camden, were the ancient inhabitants of the country, which is now divided into Northamptonſhire, Leiceſterſhire, Rutlandſhire, Lincolnſhire, Nottinghamſhire, and Derbyſhire. Other antiquaries, however, are of opinion that their territory was not ſo extenſive. The name of the Cor-Iceni plainly indicates that there was ſome kind of affinity or connection between them and their neighbours, the Iceni. Some think they were two tribes of the ſame nation, and that Cor-Iceni denotes the leſſer Iceni, from *Carr*, a dwarf, and Iceni. Others imagine that both theſe Britiſh tribes derived their name from the different kinds of animals which conſtituted their chief riches, and the tending of which was their chief employment; the Iceni from *Uchen*, oxen; and the *Cor-Iceni*, from *Cor*, a ſheep. However this be, if the two tribes did not form one nation, they were in very ſtrict alliance, and ſhared the ſame fate; having been both reduced to ſome degree of ſubjection to the Romans by Oſtorius Scapula, and totally ſubdued by Suetonius Paulinus. The Romans made great changes in the country of the Cor-Iceni, by introducing agriculture, and by building many forts and ſtations in it to keep them in ſubjection. Lindum, now Lincoln, the ancient capital of the Cor-Iceni, became the ſeat of a Roman colony, and one of the moſt conſiderable cities which theſe people had in Britain; and it is mentioned both by Ptolemy and by Antoninus in both his journies. By following the courſe of the 6th journey of Antoninus, from London to Lincoln, we meet with a conſiderable number of Roman towns and ſtations within the territories of the Cor-Iceni; as Venonæ, now Clayceſter; Ratæ, now Leiceſter; Virometum, now Willoughby; Margidunum, now Eaſt-Bridgeford; Ad-Pontem, now Southwell; and Crocoiana, now Brugh, near Cottingham. The extenſive country of the Cor-Iceni was included in the Roman province called Britannia Prima.

CORITHUS, or Corythus, a town and mountain of Italy, in Etruria, according to Servius on Virgil; but Cluvier thinks that Servius is miſtaken; and that if ſuch a place exiſted, it muſt have been in the country ſince called Cortona.

CORITIUM, a town of Aſia, towards Syria; placed near the Euphrates by William of Tyre.

CORITUS, a mountain of Italy in Umbria; now Monte Corvo.

CORIUM, a place in the iſle of Crete, near the lake or marſh called Coreſium.

CORIUNDI, a people of Hibernia, according to Ptolemy.

CORIUS, a river of Carmania.

CORIZENSIS, an epiſcopal ſee of Aſia, in the patriarchate of Antioch.

CORIZIOLA, in the *Materia Medica*, is a name given by ſome authors, particularly by Rhaſis, to the ſcammony.

CORK, the exterior bark of a tree belonging to the genus of oak (Quercus *Suber*), which grows wild in the ſouthern parts of Europe, particularly France, Spain, Portugal, and Tuſcany. When the tree is about 15 years old, it is fit to be barked, and this can be done ſucceſſively for eight years. The bark always grows up again; and its quality improves as the age of the tree increaſes. If care is not taken to ſtrip the bark, it ſplits and peels off by itſelf, being puſhed up by a ſecond growth forming under that of the preceding year.

Stripping and preparing the Bark.—The bark is taken off by the Portugueſe in ſheets or tables, by cutting it with knives having two handles, ſimilar to thoſe which the tanners or ſkinners uſe at their beam, or horſe, ſlitting it down after the circular inciſion is made, from top to bottom; to effect this inciſion they aſcend the tree by a ladder to the part where the branches ſpring from the top; they then make a ſlice or ſlip: the filaments connecting the bark with the trunk are next cut down, or through, by a knife formed like our hay-ſpade, and which they uſe in nearly the ſame manner: the bark is frequently, through haſte, broken off at the root, in which caſe the two ends are diſtinguiſhed by the appellations of "cut end" and "faſt end;" the firſt is that which had been at the top of the tree, where the circular cut was firſt made, and the ſecond is that which had been next the ground.

Another mode of accompliſhing the artificial ſtripping of the tree, is thus performed: ſeveral inciſions are made from the top of the trunk to the bottom, and at each extremity of theſe inciſions a circular cut is effected; by this operation the bark is cut off from communication with either the lower or higher parts of the tree; conſequently it is entirely deprived of ſupport; in a little time it looſens, and its ſeparation is completely accompliſhed by the hand; thus the progreſs of nature is expedited by very ſimple means. Before the operation of barking is again performed upon the ſame tree, ſhould it be a young one, it ought to ſtand three years; it is not however unfrequently cut within the period; when it is cut too young, it is generally preſerved by the Engliſh cork-cutter in his cellar till it alters from green to the colour proper for his purpoſe, which is effected merely from the time he keeps it in that ſtate, though after all, it is ſtill much inferior to that taken when the tree has arrived at maturity.

After being detached from the tree, the Portugueſe "burn it;" laying the convex ſide of the bark to the fire; in this operation they are careful to cover all the blemiſhes they poſſibly can, holes are filled up in an inſufficient manner either by the ſwelling and ſtraightening of the wood upon the fire, or by the artful introduction of ſoot and dirt. When the judgment of the burner is ſufficiently exerciſed in flattening the bark, and artificially repairing its defects, it is laid into the farm yard for ſale, in ſtacks, and bought by the merchants from thence for exportation.

Another method uſed in ſtraightening the bark, is to pile it up in pits, loaded with heavy ſtones, by which method it becomes flat, this is afterwards more completely effected in a damp cellar, and is called "laying the cork;" when this operation is finiſhed it is dryed over a ſtrong fire in what is called "a burning yard;" from negligence in this proceſs it receives too much of that black colour which is ſo frequently diſcovered in articles made of cork: when ſufficiently dryed it is ready for ſtacking.

The cork is not burnt, but only charred on each ſurface; previous to this operation the pores of the bark are open, and its conſequent ſpongineſs of texture would make it not only give too much way to the knife; but particularly in the caſe of "taps" and "bungs" would render it a filter, rather than a preſerver, of liquids. It ſhrinks with the application of moderate heat, and thereby cloſes the pores, by which any filtration might be effected. If "burning" ever be uſed as a cover for defects, it is not an original deſign but an accidental advantage, which is taken of a neceſſary proceſs; "bungs" and "taps" are always charred on both ſurfaces; good bottle corks, though the bark of which they are made is likewiſe ſubjected to the operation of fire, do not after they are cut exhibit any marks of that element, being cut in the length way of the wood, the pores lie in a contrary direction, and the charring conſequently is taken off by the proceſs of rounding them.

The cork tree as well as the uſes to which the bark is applied, &c.—This tree, as well as its uſe, was known to both the Greeks and Romans. By the former it was called *phellus.* Theophraſtus reckons it among the oaks, and ſays, that it has a thick fleſhy bark, which muſt be ſtripped off every three years to prevent it from periſhing. He adds, that it was ſo light as never to ſink in water, and on that account might be uſed with great advantage for a variety of purpoſes. That the *ſuber* of the Romans was our cork-tree is generally and juſtly admitted. Pliny relates of it every thing ſaid by Theophraſtus of the *phellus;* and from his account we learn, that at the period when he wrote, cork was applied to as many purpoſes as at preſent. At that time fiſhermen made floats to their nets of cork; that is, they affixed pieces of cork to the rope which formed the upper edge of the net, in order to keep it at the ſurface of the water. Another uſe to which cork was applied, according to Pliny, was for anchor-buoys. "Uſus ejus ancoralibus maxime navium:" that is, as this paſſage may be interpreted, it was uſed for making buoys, called "Ancoralia," which were fixed to the cable, and by floating on the ſurface of the water, over the anchor, pointed out the place where it lay. Our navigators uſe for that purpoſe a large but light block of wood, which, in order that it may float better, is often made hollow. See Buoy.

Another uſe of cork among the Romans was for being made into ſoles, which were put into their ſhoes, in order to ſecure their feet from water, eſpecially in winter; and, as high heels were not then introduced, they ſerved the purpoſe of elevating ladies and making them appear taller than they naturally ſeemed. The practice of employing cork for jackets to aſſiſt in ſwimming is alſo very ancient; for we are informed, that the Roman whom Camillus ſent to the capitol when beſieged by the Gauls, put on a light dreſs, and took cork with him under it, becauſe, to avoid being taken by the enemy, it was neceſſary that he ſhould ſwim through the Tiber. When he arrived at the river, he bound his clothes upon his head, and placing the cork under him, was ſo fortunate as to ſucceed in his attempt. The moſt extenſive and principal uſe of cork at preſent is for ſtoppers to bottles. To this purpoſe it is excellently adapted; becauſe it is very light, may be eaſily compreſſed, and expands again by its elaſticity as ſoon as the preſſure upon it is removed, and, therefore, it fills and ſtops up very cloſely the ſpace into which it has been driven by force. Beſides, it may be eaſily cut into all forms; and though it abounds with pores, which are the cauſe of its lightneſs, it ſuffers neither water, beer, nor any common liquid to eſcape through it, and it is but ſlowly and after a conſiderable interval that it can be penetrated even by ſpirits; its numerous pores ſeem to be too ſmall to afford a paſſage to the fineſt particles of water and wine, which can with greater facility ooze through more compact wood that has larger or wider pores. This uſe of corks was not altogether unknown to the Romans; for Pliny expreſsly ſays, that it ſerved to ſtop veſſels of every kind, and inſtances of its being employed for that purpoſe may be ſeen in Cato (De Re ruſtica, cap. 120.) and Horace (lib. iii. od. 8. 10.); its application to this uſe does not ſeem, however, to have been very common as other ſubſtances have been generally employed for this purpoſe. Stoppers of cork ſeem to have been firſt introduced after the invention of glaſs bottles, of which no mention occurs before the 15th century. See Bottles.

This wood is ſtill formed into ſoles for ſhoes, into corks and bungs for ſtopping bottles, &c. into a floatage for the nets of fiſhermen; it is employed generally, though perhaps with a conſiderable degree of error in teaching the art of ſwimming; it is alſo ingeniouſly uſed on account of its lightneſs, when an amputation of the human leg has been neceſſary, to ſupply the deficiency; the Spaniards line ſtone walls with it, which not only renders their houſes very warm but corrects the moiſture of the air; the Egyptians made coffins of it, which being covered in the inſide with a reſinous compoſition

poſition preſerved their dead bodies. It is burnt to make that light black ſubſtance, called Spaniſh black, from its having been firſt made in Spain.

Cork bark has not only been applied as above, but alſo in the preſervation of life, when endangered by ſhipwreck; the moſt conſpicuous exhibition of its advantages is in the application of it in the conſtruction of the "life boat" or "cork boat," as it was originally called. We have under the article *boat*, "*life boat*," given our readers a ſhort account of that ineſtimable invention; ſince which we have procured a very valuable account by the principal ſecretary of the meeting who firſt advertiſed the reward; we have alſo obtained from the liberality of Mr. Greathead, and the intereſt of the gentleman alluded to, a plan or ſection of the boat, drawn by the original inventor, which will be given under the article Life *Boat*.

A cork jacket too has been revived from an old German diſcovery, by Mr. Dubourg; to preſerve the lives of perſons in danger of drowning, which is conſtructed as follows. Pieces of cork about three inches long, by two wide, and the uſual thickneſs of the bark, are incloſed between two pieces of ſtrong cloth or canvas and formed like a jacket without ſleeves; the pieces of cloth are ſewed together round each piece of cork, to keep them in their proper ſituations; the lower part of the jacket about the hips is made like the ſame part of women's ſtays, to give freedom to the thighs in ſwimming; it is made ſufficiently large to fit a robuſt man, and is ſecured to the body by two or three ſtrong tapes ſewed far back on each ſide, and tied before; the ſtrings are thus placed to enable any wearer to tighten it to his own convenience.

Cork in its action has the elaſticity of a ſpring, and when preſſed into any aperture, it exerts a force acting outwardly on all ſides from the centre. It is this quality that makes it valuable in ſhutting out the external air from liquors, and elaſtic fluids; and it is fitted for this purpoſe in a degree proportioned to the impermeability of its pores. The elaſticity of cork has alſo been employed for many other purpoſes in the arts; it forms the ſpring of the lifter in ordinary candleſticks, and where the frame is not heavy, it can be made into a good ſubſtitute for the pulleys and weights of the ſaſhes of windows. See Candlestick and Window-ſaſh.

Other vegetable productions have likewiſe been occaſionally employed poſſeſſing qualities ſimilar to cork. The ſpondias lutea, a native of South America, which flouriſhes in moiſt ſituations, and which is there called monbin or monbain, is ſometimes brought to England, as a ſubſtitute for cork. The roots of liquorice are applied to the ſame uſe, and on this account, as well as its medicinal properties, is much cultivated in Sclavonia, and exported to different countries. The tree called myſſa, which is found in North America, has alſo been applied to ſimilar purpoſes.

Cork-*cutting*, or the *Manufacturing of Corks*. This buſineſs, though it is thought one of the moſt dirty, is not one of the leaſt profitable; it is likewiſe eaſy in the acquirement. The cork, after being preſſed into ſquare pieces, as above noted in the treatment of the bark, is received by the cork-cutters, and if not ſufficiently flat for their purpoſe, they "lay" it again over a fire in their "burning yard," turning the convex part to the flame; the heat by twiſting the edges of the bark, counteracts the natural bend, and compels it to receive a flat form. During this operation, a conſiderable degree of attention is paid to ſmoothing it, and particularly again to cover its defects. It is next cut into ſlips, narrow or wide, according to the intended cork, bung, or tap, for ſuch are the names of the general diviſions in this buſineſs. The uſe of the two former is well known, the latter is uſed for ſtopping the tap-holes of barrels, as the name implies. Theſe ſlips are again cut into ſquares, of a length proportioned to the uſe they are intended for. This operation is performed by one man, from whom they are handed forward to ſeveral others. A further diviſion of corks takes place, of theſe different ſorts according to their lengths, and are denominated "ſhort," "ſhort long," and "full long."

The cork-maker places himſelf before the table or plank, on which is faſtened a board about three inches thick, four broad, and twelve long: immediately on a line with his left hand is a piece of wood, riſing about four inches from the board, and fixed about the middle of it, on which the cork is laid, after being cut as above. This wood not only ſupports the cork, and is as a guide to the workman, but by its elevation above the board, gives room for the knife to cut a part of the cork in a ſmooth and circular manner, without ſtriking on the table below. The piece is then turned to where the laſt cut ceaſed, and this is continued until the knife has gone completely round; the top and bottom are then pared level, and the cork thrown into a box or baſket, with the reſt of the ſame length. As the bark is not of the ſame quality throughout each piece, the corks are ſorted by a boy into four kinds, "ſuperfine," "fine," "common," and "coarſe," and are ſold accordingly.

The only tool employed by the cork-cutter is a knife about three inches broad in the blade, and about ſix inches long, very thin and ſharp, and equal in breadth from the handle nearly to the end, which is finiſhed by a gentle curve. This knife he ſharpens upon the board where the guard is placed, by one whet or ſtroke on each ſide, after every cut, and now and then upon a common whet-ſtone.

From the foregoing review it is evident, that the art of a cork-cutter is principally to obtain a regular, round, and quick turn of the wriſt, in guiding the knife ſo as to complete a pretty correct circle, and to make a ſmooth ſurface; it is on this account that the knife muſt be particularly ſharp, to enable the workman to turn it with eaſe.

The parings of the cork are carefully kept, and ſold to the dry colour makers, to be burnt into Spaniſh black.

It may be ſuppoſed that thoſe who give the detail of any manufacture would be the beſt able to point out improvements in it, though this is not always the caſe; yet one improvement in the "laying" of the cork wood, appears of great importance to the writer of this. In the preſent mode, a great deal of time is loſt in placing and removing the ſtones uſed to flatten the bark; and though the weight may be moderated or introduced by degrees, yet it cannot be done in that regular manner which appears the moſt likely to effect the purpoſe. In addition to which it may be obſerved, that in proportion as the weight is careleſsly applied, will be the riſk of breaking thoſe pieces which moſt partake of the circular bend of the tree. To remedy this inconvenience, and to do away the old, groſs, and cumbrous method, a ſcrew might be uſed, ſuch as that employed by the printers in preſſing their work; by its operation a gradual preſſure would be given, the former objections done away, and a much neater and workman-like method adopted.

Cutting the cork into ſtripes might alſo be accompliſhed with much greater facility; the whole breadth of the cork might be cut by one ſtroke, by means of ſemi-circular knives, like ſmall cheeſe knives, ſet at certain diſtances, in a frame, which, by being affixed to a pole, with a croſs-bar as a handle, might be driven through the whole breadth, in the ſame time that a ſingle ſlip is cut by the preſent method.

Cork, *Acid of*, in *Chemiſtry*, a yellowiſh thick acid matter obtained by diſtilling four times its weight of nitrous acid from cork. This is ſoluble in water and has an auſtere bitteriſh taſte. It does not cryſtallize, but becomes conſiſtent like wax by evaporation; is ſoluble in ardent ſpirit; forms deliqueſcent ſalts with the earths and alkalis; and has as ſtrong an attraction for lime as the acid of ſugar.

Cork, *Mountain*, *Suber montanum*, or *Corium montanum*, in *Mineralogy*, a ſpecies of the muriatic genus of earths and ſtones, according to the arrangement of Kirwan (Mineral. vol. i.) Its colour is white, or reddiſh-white, or yellowiſh-grey, or iſabella, or ochre-yellow, or yellowiſh-brown. It is found either in thick compact pieces, and then called "mountain cork;" or in thin flat pieces, then called "mountain leather or paper;" or cellular, and then called "Caro montana, &c." The luſtre is 0, rarely 1, and tranſparency 6. Its fracture preſents fibres confuſedly interwoven with each other, ſometimes ſo ſubtile as to be diſtinguiſhed with difficulty, and thus they give the fracture a compact earthy appearance. Hardneſs 4; it takes an impreſſion, or yields like cork to the finger, and is ſomewhat elaſtic. Sp. gr. before it is penetrated by water, from 0.6806 to 0.9933; and after admiſſion of water, from 1.2492 to 1.3492. (Briſſon.) If perfectly dry, and ſufficiently thick, it gives a ſound when ſtruck. It feels meagre. Bergmann and Sauſſure found it fuſible, though with difficulty, by the blow-pipe. By Mr. Bergmann's analyſis it contains from 56 to 62 *per cent.* of ſilex, 22 to 26 of aërated magneſia, from 2.8 to 12.7 of argill, about 3 of calx of iron, and from 10 to 12.7 of aërated calx.

Cork-*ſcrew*, in *Mechanics*. *Fig.* 1. *Plate* XVII. *Mechanics*, is a ſimple cork-ſcrew, conſiſting of a ſcrew, A, turning in a female ſcrew attached by two ſmall rods to the collar B, which receives the neck of the bottle from which the cork is to be extracted; the two rods have a groove in them to receive the ends of a croſs piece, connected with the cork-ſcrew, and prevent its turning round with the ſcrew A.

Fig. 2. is nearly the ſame, except that the nut, B, is turned inſtead of the ſcrew.

Fig. 3. is called the *ne-plus-ultra* cork-ſcrew; it conſiſts of two cork-ſcrews A, B, one within the other; the ſcrew which enters the cork is fixed to the internal one. In uſing this inſtrument both ſcrews are ſcrewed up to their ſhoulders, and the whole is turned round together till the cork-ſcrew has penetrated the cork. The handle and the two ſcrews are then turned in the ſame direction, without permitting the frame to turn, till the cork is drawn. The handle is then turned the contrary way, and the ſcrew drawn out of the cork by means of the ſmall ſcrew B.

Fig. 4. is a ſcrew of nearly the ſame kind, a rack and pinion being ſubſtituted for the ſcrew B.

A corking-machine is repreſented in *fig.* 5; in which A is a treadle to be worked by the foot; it is connected by a rod *b*, with an iron-lever D; the bottle to be corked is placed in a leathern caſe E, faſtened to a board ſliding in a groove; the cork is inſerted, and the bottle ſlid under the lever D, the foot is then placed on the treadle, and the cork forced in; the corks are firſt pinched by placing them under the lever at *d*, to make them enter eaſily.

Cork-*tree*, in *Botany*. See Quercus *Suber*.

Cork, in *Geography*, a county of Ireland, in the province of Munſter, lying in the ſouth-weſtern extremity of the iſland, and by far the greateſt in extent and population. It has the Atlantic ocean on the ſouth and ſouth-weſt; the county of Kerry on the weſt; thoſe of Limerick and Tipperary on the north, and that of Waterford on the eaſt. Its greateſt length extending eaſtward from Kerry is 78 miles (99 Engliſh); and its greateſt breadth 56 miles ($71\frac{1}{2}$ Engliſh) containing 1,048,800 plantation acres (1,685,920 Eng.) and being about 1638 (or 2,653 Engliſh) ſquare miles. The number of houſes, according to an official return made to parliament in 1791, was 76,739, and they muſt have ſince conſiderably increaſed. From this the population has been eſtimated at 416,000, which is allowing 9.06 to a houſe in the city of Cork, and 5.6 to a houſe in other parts of the county, which thoſe who are acquainted with the many populous towns in this county, and with the manner in which the cottages are crowded, muſt admit to be a very moderate computation. According to this ſtatement, which is taken from Dr. Beaufort, the county of Cork contains very nearly a tenth-part of the number of acres in all Ireland, and above a tenth-part of the whole population. For not only its abſolute population is the greateſt, but its relative population is amongſt the moſt conſiderable, being nearly the ſame as that of Antrim and Londonderry, and exceeded only by the very populous diſtricts of Armagh, Monaghan, Down, Louth, and Dublin. It cannot therefore be wondered at, that it has three militia regiments to keep up. The number of pariſhes is 269, in which there are 105 churches. The biſhoprics of Cork, Roſs, and Cloyne lie entirely within the county, and all the above pariſhes belong to them except five. Cork returns eight members to the imperial parliament, *viz.* two knights of the ſhire, two for the city of Cork, and one each for the boroughs of Kinſale, Youghel, Bandon, and Mellow. In ſo large a diſtrict there muſt be a great variety of ſoil. It contains more good land than bad, and ſome parts of the county are highly cultivated, eſpecially the neighbourhood of the Blackwater, and the barony of Innſkilly in the eaſtern part. The barony of Ban and Bantry, which is covered with mountains, and the weſtern parts of Carbery and Muſkerry, in which are the Sheehy mountains, are the pooreſt and the leaſt improved. The whole county is hilly, and, a few places excepted, very deſtitute of trees, which is the conſequence of the vaſt number conſumed in the iron-works in the 17th century, without new ones being planted. There are however ſome ſpots which are richly wooded. The Galtees and the Waterford mountains bound it on the north-eaſt. The Nagle mountains and the Bogre which run weſtward through the heart of the county, though ſeparated from each other by a long valley, may be conſidered as part of a range, that is continued with few interruptions from Helwick Leed in Waterford, acroſs the counties of Cork and Kerry to the ocean. On the north of this range lies a narrow plain, which extends from the bounds of Tipperary to Dingle-bay. The rocks moſt common in this county are argillaceous. A coarſe red or grey ſandſtone, often varying to a coarſer and more ſlaty fracture, forms the greater part of the coaſt and the hills near it. There are in this many ſtrata of ſlate, ſome of good quality for roofing houſes. A large vein of limeſtone interſects the red argillite, commencing in the peninſula of Corhnbeg and the iſlands in Cork harbour, and extending on the ſouth ſide of the river Lee to its junction with the Bride, and thence through a valley adjoining this latter river to the diſtance of about 12 miles from the city of Cork. This limeſtone is evidently ſecondary as it contains a variety of petrified ſhells; and much of it on ſcraping has that diſagreeable ſmell which characteriſes *Stinkſtone*. This diſtrict contains ſome marbles which admit a good poliſh. In ſome of the limeſtone quarries near the city of Cork, there are not only very tranſparent quartz cryſtals, but alſo large amethyſts which are much eſteemed by the jewellers. The bottom of Bantry bay is entirely compoſed of broken pieces of coral, called coral ſand, which is found to be an excellent manure. In Carbery there is a magneſian limeſtone. On the Cork ſide of the Galtees there is abundance of fine limeſtone, and this uſeful article may be procured on moderate terms in every part of the county. The Galtee mountains themſelves conſiſt of a very coarſe pudding ſtone, in which is much iron ſhot quartz. Near Galtymore, on the eſtate of the counteſs of Kingſton, is the remarkable cave of Skeheenrinky, which is deemed by Mr. A. Young ſuperior to the peak. (See MITCHELSTOWN.) The county of Cork abounds in fine rivers, and good harbours. The Blackwater riſes in the mountains between Limerick and Kerry, and flows eaſtward through this county, receiving the Awbeg, the Funchem, the Bride, and many ſmaller ſtreams in a courſe of 80 miles. The Awbeg is the *Mulla* of Spenſer, who reſided at Kilcolemen-caſtle, not far from its banks, and the Blackwater is the *Awinduff* of the ſame poet. On the banks of the Blackwater are many fine orchards remarkable for the cyder procured from them; and ſeveral handſome ſeats. It is navigable from Cappoquin in the county of Waterford, where it turns to the ſouthward, and diſembogues itſelf in the harbour of Youghel. The Lee iſſues from a lake called Gougane-Barra; which is, according to Smith, a moſt elegant and romantic ſpot, and has by ſome been preferred even to the lake of Killarney. This lake is weſt of Inchigeelch, by which town the river paſſes, and thence to the city of Cork, above which it divides into two branches which unite below the city; and it contributes much to the wealth and proſperity of that great commercial town. The paſſage down the river from Cork to the outer harbour conſiſts of a ſucceſſion of varied and beautiful ſcenery, which can ſcarcely be ſurpaſſed. The Bandon is another fine river, which, after watering the large and thriving town of Bandon-bridge, and the village of Iniſhonan falls into the harbour of Kinſale: it is navigable for large ſloops as far as Iniſhonan, between winding banks which ſtill deſerve the character given them by Spenſer; "the pleaſant Bandon crowned with many a wood." The whole coaſt of Cork is broken into creeks and bays. The harbour of Crookhaven, near Mizen-head, the ſouth-weſt point of Ireland, is often reſorted to, when the eaſterly winds prevent veſſels from gaining the harbour of Cork. Bantry-bay, a little to the north of this cape, is, at leaſt, 20 miles long, and from three to five broad, every where deep, ſheltered, and free from rocks. For particulars of theſe harbours, and of the many towns which this county contains, the reader muſt be referred to their reſpective articles. At Dromagh and Dromana, in the barony of Duhallow are coal-pits, which are worked, but not in a judicious manner, or to much advantage. There is much ironſtone, and there were many furnaces; but the dearneſs of fuel is a great check. Much linen is woven about Dunmanway, which is purchaſed by merchants in Bandon, and ſhipped from Cork. Near Bandon is a very extenſive cotton mill, which gives employment to great numbers. There are ſome other manufactures, but none of much conſequence, except thoſe which belong more properly to the account of the city of Cork. The peaſants in the county are very thickly diſſeminated. In many parts they are very dependent on their landlords, working for them at a low price in payment of the rent of their cottages, and the ſmall lot of ground adjoining them. This has been called the *Cottar* ſyſtem. The cottages in general, though bad, are not ſo wretched in appearance as in ſome other counties, and with ſcarcely a ſingle exception have a ſmall garden for cabbages, as well as a field for potatoes, attached to them. The laſt ſupplies them with the principal article of their food. They all have a pig, and ſome of them ſeveral, in which laſt caſe they generally kill one for themſelves at Chriſtmas. This animal, as well as ſome poultry, often inhabits the ſame dwelling with its owner, though, of late, pig-ſtyes are becoming more common. There is a dunghill formed before the door of every cottage, which has a diſagreeable appearance; but it is often the only place the owners have for laying up manure for their potatoe gardens. Spinning is the general buſineſs of the women, and notwithſtanding the ſevere remarks that have been made on the lazineſs of the lower Iriſh, they are ſeldom ſeen idle. They ſpin more wool than flax. The middling and lower farmers have, of late years, improved much, both in their wealth and manner of living, and there is reaſon to expect further improvement, if the encouragement to agriculture continues, and the peace of the country be undiſturbed. The ſyſtem of agriculture, however, in uſe, is very bad, and much praiſe cannot be beſtowed on the great landholders for their exertions to improve it. Cork partakes, with other counties of Ireland, the evils ariſing from abſentees, ſome of the greateſt proprietors being of this claſs; yet few counties have ſo great a proportion of reſpectable reſidents. With reſpect to the hiſtory of this county, we may obſerve that it was a kingdom of itſelf before the arrival of the Engliſh, and was governed by the M'Cartys. A deſcendant of that family, on reſigning his Iriſh title of *M'Cartymore*, was made by queen Elizabeth, earl of Clancarty, a title which was attainted ſoon after the revolution, in conſequence of the attachment of the earl to the dethroned monarch. Henry II. granted the whole kingdom of Cork by charter to Robert Fitz Stephen and Milo de Cogan, about the year 1177; but they were able to get poſſeſſion only of a ſmall part of it. It is unneceſſary to trace the various changes of property which took place from forfeitures and intermarriages. It may be right however to mention that queen Elizabeth divided a great number of acres, which had been forfeited, amongſt various undertakers, who agreed to introduce Engliſh tenants. Sir Walter Raleigh had three ſeignories and a half given to him on this occaſion, which he ſold, in 1602, to ſir R. Boyle, afterwards the firſt earl of Cork, who was a great improver, and founded ſeveral towns. This property now chiefly belongs to the duke of Devonſhire, who is the repreſentative of the elder branch of the Boyle family. Many of Cromwell's officers afterwards obtained ſettlements in this county. Beaufort's Memoir. Young, &c. &c.

CORK, the ſecond city of Ireland, and capital of the county of the ſame name, was originally built on a low marſhy iſland, formed by the branches of the river Lee, from which circumſtance its name is ſaid to be derived, *corcach*, in Iriſh, ſignifying a moor or marſh. It appears, from the imperfect account we have of the early periods of Iriſh hiſtory, that in the 5th, or, as Ware ſays, in the 7th century, there lived a pious hermit called Barroc, or Fin Barroc, and in after ages, St. Fin Barry, who founded a monaſtery for regular canons of St. Auguſtine, and a ſchool on the ſouth ſide of the river Lee, near the place where the preſent cathedral ſtands; and that his fame drew ſuch numbers to it, that to uſe the words of Colgan, "it changed a deſert into a city." In the 9th and 10th centuries, this monaſtery and town were often plundered by the Danes, who then infeſted Ireland; but, at the beginning of the 11th century, they founded the preſent town in an iſland of the river, of an oval ſhape; and called it either from the name of the town they had burned, or the marſhy ſituation, *Corkan.*

ſan. It was, however, very ſmall, and probably did not contain above 1000 inhabitants; but the creeks which interſected it, were convenient for mooring the Daniſh veſſels, and thus their merchandize and plunder were ſecured. On the arrival of the Engliſh in 1172, Cork became an Engliſh colony, and a royal garriſon. King John ordered the fortifications to be repaired; a ſtone wall was built; caſtles were erected at the north and ſouth gates; and bridges were made with portcullises for maintaining communication with the little towns adjoining the abbeys that had been founded on the north, as well as on the ſouth ſide of the river, and which are now the north and ſouth ſuburbs. Cork, however, was not ſo early a place of the firſt importance in the iſland. Stanihurſt ſpeaks of it as inferior to Limerick and Waterford; and Boate, who wrote near a century later, in the time of Cromwell, as inferior to the ſame towns, and Galway. Camden, who wrote in the time of Queen Elizabeth, thus deſcribes it: "It is of an oval form, incloſed with walls, and encompaſſed with the channel of the river, which alſo croſſes it, and is not acceſſible but by bridges lying along, as it were, in one direct ſtreet, with a bridge over it. It is a populous little trading town, and much reſorted to; but ſo beſet with rebel enemies on all ſides, that they are obliged to keep conſtant watch, as if the town was continually beſieged, and dare not marry out their daughters into the country, but contract one with another among themſelves, whereby all the citizens are related in ſome degree or other." But though the town of Cork was confined to the ſmall iſland now occupied by the main ſtreet and the numerous lanes which interſect it; yet the ſuburbs were conſiderable, and were protected by ſeveral caſtles.

The trade of Cork, in theſe periods, was not extenſive, and the principal ſupport of the inhabitants was the conſumption of the monaſteries, of which there were ſeveral. As a haven, Kinſale was in greater eſtimation. Since the commencement of the 18th century, the town has been gradually enlarged, by taking in and building upon the ſeveral marſhy iſlands which lay near the principal one. The channels which were between theſe, ſerved the purpoſe of canals, and were convenient in ſome reſpects, by enabling the merchants to load and unload their veſſels at their reſpective warehouſes, which often joined their dwelling-houſes. In this, it reſembled a Dutch town, and ſuch is the deſcription given of it in "the Traveller's Guide through Ireland," publiſhed in 1806. It is now, however, more than twenty years ſince the plan was adopted, of filling up theſe canals; and there is at preſent (1807) not a ſingle one in the city, which appears as one iſland, lying between the north and ſouth branches of the river. By this means, there are ſeveral wide pleaſant ſtreets, which want only regularity in the buildings, to enable them to vie with thoſe even of the capital. The health of the city has alſo been promoted, for putrid exhalations aroſe from theſe canals, which were a receptacle for filth of all kinds; and, when the tide was out, had both a diſagreeable ſmell and appearance. Many houſes have been rebuilt, and in conſequence of a new bridge thrown over the north channel, the city is increaſing rapidly on the northern bank of the river. So long ago as 1788, the houſes were 8093 in number; ſince which time, there has been a conſiderable increaſe. The number of inhabitants in ſeveral of the old houſes is very great, in ſome caſes above 50; and from the account Dr. Whitelaw has given of the population of Dublin, we may ſafely reckon ten to a houſe. We ſhall then be within bounds in ſtating the population of Cork at 80,000. It may ſerve to ſtrengthen this opinion, that in the year 1801, when, in conſequence of the ſcarcity, committees were appointed to make returns of the perſons needing chariatable aid in each pariſh, the number was very nearly 30,000. The appearance of the city has nothing ſtriking to recommend it in the ſtructure of the houſes. There are many comfortable, and even elegant manſions, but the want of uniformity, from their being built at different periods, and from the caprice or different views of the builders, prevents their appearing to as much advantage as they would otherwiſe. Cork has no public buildings of much conſequence. The cathedral is a modern church, which is neat and convenient, but is ſurpaſſed by many country pariſh churches in England. The church of the Holy Trinity, or Chriſt-church, is larger, but is only remarkable for an awkward leaning, in conſequence of a ſettlement at the time of building, which ſtrikes every ſtranger, and made it neceſſary to take down the ſteeple. There are five other pariſh churches, and a French church. The Roman Catholic pariſh chapels are three in number, which accommodate immenſe crowds of people. One of theſe has been lately rebuilt at a great expence. There are, beſides, four chapels belonging to friaries and the chapel of the nunnery. There are ſix meeting-houſes for Proteſtant diſſenters, *viz.* one for Preſbyterians, one for Baptiſts, one for Quakers, one for Calviniſts, and two for Methodiſts. The biſhop's palace, which is near the cathedral, is an elegant and convenient modern ſtructure, containing ſome ſpacious apartments. The exchange is a light and elegant building, in the Italian ſtyle, ornamented by columns of the Doric and Ionic orders. It was built by an Italian architect; as was alſo the corn-market houſe, of the Tuſcan order, which has great merit as a building for that purpoſe. Adjoining to the exchange is the city court-houſe, and a very extenſive coffee-houſe. The manſion-houſe, where the mayor reſides, during his year of office, is a plain building, but contains two very ſpacious rooms for public entertainments. In one of them is a ſtatue of William III., of plaſter, which is painted, and which Mr. Twiſs having confounded with a ſtatue of the earl of Chatham, of white marble, has made the ſubject of ridiculing the corporation. The old cuſtom-houſe is a large brick building, which having been deemed ineligible for buſineſs, has been promiſed by government to *the* INSTITUTION *for applying Science to the common purpoſes of Life;* and a new cuſtom-houſe is to be erected in a better ſituation. There are are two theatres; the Theatre Royal is tolerably large, but ſtands in great need of extenſive repairs and embelliſhments; the other, which was built by Mr. Aſtley, is much ſmaller. The aſſembly room is very large, and the profits derived from it increaſe the funds of the North Infirmary, to the corporation of which it belongs. There are ſeveral bridges. St. Patrick's bridge over the north channel is one of the moſt elegant ſtructures in Europe. It is built, in ſome reſpects, on the plan of the beautiful bridge at Neuilly, near Paris, and conſiſts of a centre arch of 60 feet, and two of 50 feet; which arches are exact ſemi-ellipſes. Mr. Shannchau was the architect. Parliament bridge, over the ſouth channel, has been lately rebuilt, with a ſingle arch, and makes a handſome appearance. The new barrack, at a ſhort diſtance from the city, on the north, is on a commanding eminence, ſo as to be ſeen at a great diſtance from the city, in various directions. It is very extenſive, containing accommodation for four regiments of foot, and 1000 horſe, with an hoſpital and ſuitable apartments for officers. The old barrack on the ſouth-ſide is ſtill retained, and there is a convenient general hoſpital near it. The artillery have alſo a barrack and ſtores; and there is a magazine about half a mile from the city. About three miles up the river are very extenſive powder-mills, with large ſtores, at a place called Ballincollig, belonging to government. The public-market, nearly in the centre of the town, is very neat and convenient. The meat-market conſiſts of three rows, on each ſide of which the butchers have ſtalls. The whole is well flagged, covered in, and lighted from above. Adjoining, are the fiſh, poultry, and root markets. Theſe markets are open, and ſupplied on every day, except Sunday; but on Wedneſdays and Saturdays, which are reckoned market days, the ſupply is abundant, and of the beſt quality. There are ſome inferior markets, but they do not deſerve notice. The county jail is a handſome new ſtructure, built at a ſhort diſtance from the city, which will enable the grand jury to take down the ſouth gate at one end of the main ſtreet; on, and adjoining which, was the old county jail. As a new city jail is ſhortly to be erected, the north gate may alſo be taken down, which will be a material improvement to that part of the city. The bridewell is a plain building, ſuitable to its purpoſe. The county court-houſe has been lately new-modelled, and an elegant entrance to it built, ſo as to be more worthy of the extenſive and opulent county, the buſineſs of which is tranſacted there.

There are a great number of charitable inſtitutions, but the buildings are not remarkable. Where the funds, indeed, depend on voluntary contributions, it cannot be expected that there ſhould be money to expend on ornaments. If, however, they cannot be ſpoken of as contributing to the beauty of the city, they undoubtedly do honour to the feelings of the inhabitants. There are two infirmaries, containing upwards of 50 beds; a houſe of induſtry, with commodious cells for lunatics adjoining it; a houſe of recovery, for the reception of fever patients; a lying-in hoſpital; a foundling hoſpital, which receives about 200 children, beſides thoſe at nurſe; a blue-coat hoſpital for 24 boys; a ſchool of induſtry for 100 children of both ſexes, with ſeveral alms-houſes and pariſh ſchool-houſes. There are, beſides, a general diſpenſary, which is provided with every thing neceſſary for reſtoring ſuſpended animation; a ſociety for relieving perſons confined for ſmall debts, and for lending ſmall ſums of money to poor tradeſmen; a ſociety for relieving the labouring poor, in time of ſickneſs; and a ſociety for aſſiſting ſtrangers, and enabling them to return to their reſpective homes. Except the foundling hoſpital, which is ſupported by a tax on coal; and the houſe of induſtry, which receives grants from the county and city grand juries; all of them chiefly depend on voluntary contributions, or on public amuſements, which are made in a great degree conducive to charitable purpoſes. The conſequent difficulty of procuring funds for their ſupport, obliges the conductors of theſe inſtitutions to uſe rigid economy: yet it may be queſtioned, whether the time now ſpent in providing neceſſaries might not be better employed in inſpecting the internal regulations; and whether a permanent ſupport for every uſeful inſtitution would not, on that account, be deſirable. Cork has alſo a ſociety *for bettering the condition and increaſing the comforts of the poor*, which maintains a correſpondence with the ſimilar ſocieties in London and Dublin, and has ſuggeſted many uſeful plans, ſome of which are perſevered in with ſucceſs. Though the citizens of Cork have been ſtigmatiſed, by ſome illiberal travellers, as neglectful of the ſciences and fine arts; yet there ſeems to be no juſt ground for this cenſure. The public library, ſupported by annual ſubſcriptions, contains a large and well choſen collection of books, which is rapidly increaſing. The inſtitution already referred to, which alſo originated in private ſubſcriptions, has a ſcientific library, a large collection of minerals, and the neceſſary apparatus for giving lectures in natural philoſophy and chemiſtry. The managers of it, having received the countenance and ſupport of government, are now adding a botanical garden, and extending their plan in many reſpects. The proprietors of the inſtitution, with ſome other gentlemen, form a literary and philoſophical ſociety, which meets on two evenings in every month. With reſpect to the fine arts, muſic is a favourite amuſement; and there are many excellent performers, both profeſſors and amateurs. The juſtly celebrated Barry, who was a native of Cork, was firſt brought into notice by an ingenious townſman, Dr. Keigh; and there are not wanting, at the preſent time, men who have taſte to diſcern, and liberality to encourage, riſing merit: though a place ſo remote from the capital cannot be expected to afford ſcope for eminent talents. The environs of Cork, towards Paſſage and Glanmire, are extremely beautiful: the lands riſe in gentle hills, ornamented with many country houſes, gardens, and plantations, and with woods and fields of variegated verdure. On an iſland between the two branches of the Lee, above the city, is a walk of an Engliſh mile in length, planted with trees; from which there is a pleaſant view of part of the city, and of the ſuburb of Sunday's Well. It is called the Mardyke, and is a faſhionable walk. But whatever advantages its environs may poſſeſs, or whatever improvements may take place in this city, the ſource of all muſt be ſought in its ſafe and capacious harbour, which has now become a regular ſtation for an admiral, and which is the place of rendezvous for fleets ſailing to the Weſt Indies. The principal export from Cork has long been proviſions, including beef, pork, and butter, made up either for the Weſt Indies, or for the ſupply of the Britiſh fleet. The average exportation of beef, in the years 1743-4-5, was 92,950 barrels; the average of butter, in the ſame years, was 84,105 *cwt.*; and Smith ſays, it was aſcertained that the average number of bullocks and cows ſlaughtered in Cork, from Auguſt to Chriſtmas in each year, was near 100,000. The export of butter began about the year *1633*; and about the ſame time the merchants began to barrel up their beef and butter with hoops bound about with twigs, after the Engliſh manner; and at preſent they are alſo iron-hooped. The average of beef for 19 years, ending in 1773, had increaſed to 291,970 barrels; and that of butter to 120,000 *cwt.* The export of pork was at that time inconſiderable. The average value of the whole exports was 1,100,190*l.* ſterling. The other articles of export were hides, bay and woollen yarn, camblets, ſerges, candles, ſoap, tallow, herrings, glue, wool, and ſome ſmall articles. Of late years, the export of beef, and of all the articles connected with it, has decreaſed; and that of yarn, camblets, and ſerges, has almoſt entirely ceaſed: but the export of pickled pork and bacon, of corn, of porter, ſpirits, &c. has become conſiderable. The quantity of butter exported in 1806 was 160,000 *cwt.*; the number of black cattle, on the average of the three laſt years, was only 18,000; the number of calf-ſkins, on an average of the ſame years, about 50,000. The imports are chiefly for the ſupply of the city, and the adjoining diſtrict. The breweries and diſtilleries of Cork are a great ſource of wealth. There are five porter breweries, beſides many of ale and ſmall beer. That diſtinguiſhed by the name of the Cork porter brewery is the moſt extenſive, not only in Cork, but in Ireland, and is probably ſurpaſſed only in London. There are four large diſtilleries, each of which pays 2100*l.* duty *per* week. At one of theſe is a ſteam-engine, of Boulton and Watt's lateſt conſtruction: it is of 40 horſe power, and no expence has been ſpared in the erection of it. The manufacture of clothing for the army is alſo very extenſively carried on; and there are many leſſer factories for coarſe cloth, ſerge, &c.

The manufactories of ſail-cloth, ſheeting, paper, leather, glue, glaſs, &c. are alſo conſiderable. The corporation conſiſts of a mayor, two ſheriffs, a recorder, and ſeveral aldermen. The charter was given by Charles I. The ſheriffs are choſen by the freemen at large; and, after having ſerved the office, are called burgeſſes. On the day of election, the names of all theſe burgeſſes are put into a box or hat, and five names are drawn out: of theſe five the freemen are to chuſe one to be mayor for the enſuing year. By an agreement, however, which has been entered into by a great number of freemen, who form a club, the ſenior burgeſs, if willing to ſerve, is always elected. The ſame club has alſo aſſumed to itſelf the choice of ſheriffs, ſo as to render the public election a mere farce, or rather a ratification, according to form, of what has been previouſly determined at a meeting of the club. Cork, as well as Dublin, retains the privilege of ſending two members to the imperial parliament. The electors conſiſt of about 1500 freemen, and a number of freeholders in the county of the city, which is very extenſive. The eldeſt ſons of freemen are entitled to their freedom, as well as thoſe who ſerve a regular apprenticeſhip to freemen. Many alſo obtain this privilege by favour every year; for as the number of voters is too great to admit of any attempt to dictate to them at elections, ſo there is little inducement to throw difficulties in the way of obtaining freedom. The income of the corporation, which ariſes chiefly from duties paid by thoſe not free on articles of trade brought into the city, is ſo ſmall as to be ſcarcely ſufficient for the current expences. In hiſtory Cork has not been remarkable. Like moſt other parts of Ireland, it engaged in the intereſt of the impoſtor, Perkins Warbeck, which brought the citizens into ſome difficulty. In 1690 it was beſieged by king William's forces, under the earl (afterwards duke) of Marlborough, and taken after a ſhort reſiſtance. The duke of Grafton, a natural ſon of Charles II., was killed at this ſiege.

Cork is 126 Iriſh miles S.W. from Dublin. The latitude of the obſervatory of the Cork Inſtitution is 51° 53′ 54″ N. Longitude W. from Greenwich, in time, 33′ 56″; in degrees, 8° 29′. Smith, Young, &c. &c.

Cork, *Biſhoprick of*, is ſuppoſed to have been founded in the ſeventh century. It was united with Roſs by queen Elizabeth, in 1586; and they are both contained in the county of Cork, as is alſo the adjoining one of Cloyne. The Union is, in Iriſh miles, about 65 by 17; and in Engliſh, 83 by 23. The number of acres is 480,300, which are divided into 127 pariſhes, of which only 54 have churches. Beaufort.

Cork-*bay*, a bay on the eaſt ſide of Newfoundland iſland.

Cork, or Corking *of a ſaddle*, are pieces of wood upon which the bolſters are made faſt.

This part of the ſaddle was formerly made of cork, whence it ſtill retains the name.

CORLAY, in *Geography*, a ſmall town of France, in the department of the Côtes du Nord; is the chief place of a canton, in the diſtrict of Loudéac. The town contains 1483, and the canton 6481, inhabitants, diſperſed in five communes, upon a territorial extent of 117½ kiliometres.

CORLIEU, in *Ornithology*, the name given by Albinus to the Scolopax *totanus*, the ſpotted red-ſhank of Pennant, and ſpotted ſnipe of Latham.

CORLIN, in *Geography*, a ſmall town of Pruſſian Pomerania, on the river Perſante; 12 miles S.E. of Colberg. It has a few woollen manufactures.

CORLIS, in *Ornithology*, the common curlew, or Scolopax *arquata*.

CORMA, in *Ancient Geography*, a river of Aſia, in the territory of Chalonitis, which diſcharged itſelf into the river Delæs or Silla.

CORMALOS, a river of Aſia Minor, in the Troade.

CORMANTIN, Little, in *Geography*, a village of Africa, ſituated on the Gold Coaſt, three miles from Mawri, and a little below Aga; ſo called in contradiſtinction to Great Cormantin, from which it is diſtant 4 miles W.S.W. The French and Portugueſe formerly carried on a great trade with this place, in which the Dutch alſo ſhared, till it was diſcovered that the negroes adulterated the gold. About the year 1682, the Dutch reſumed the trade, when they enlarged and ſtrengthened Fort Amſterdam, the chief reſidence of the Engliſh, till they were forced to abandon it by De Ruyter, in 1665. The fort is a ſquare ſtone building, fortified with four baſtions, mounting 20 pieces of cannon; having convenient apartments for the officers and ſoldiers, and commanding fine views of the country and ſea. Large ciſterns, receiving the rain-water, ſupply the fort with water.

Cormantin, *Great*, a large and populous town, on the Gold Coaſt, in the territory of Fantin, ſtanding about cannon-ſhot from the fort of Little Cormantin, on a high hill behind, and under the cannon of the fort. The town is occupied by a conſiderable number of merchants and fiſhermen, together with other inhabitants of different employments. Cormantin and Anamaboa were formerly the great marts of the Engliſh and Dutch commerce, as they were much frequented by the Akhauefe, who came hither with their goods in large caravans. N. lat. 5° 5′. E. long. 0° 8′.

CORMASA, or, as Polybius calls it, Curmasa, in *Ancient Geography*, a town of Aſia, in Pamphylia.

COR-MASS, the name of a grand proceſſion, ſaid to have been eſtabliſhed at Dunkirk during the dominion of Charles V., and renewed on St. John's day, the 24th of June. After the celebration of high maſs, the proceſſion, conſiſting of the ſeveral tradeſmen of the town, begins. Each perſon has a burning taper of wax in his hand; and after each company comes a pageant, followed by the patron-ſaint, uſually of ſolid ſilver, richly wrought and adorned. The companies are followed by muſic; and after the muſicians, the friars, in the habits of their order, the ſecular prieſts, and then the abbot magnificently adorned, and preceded by the hoſt. Machines likewiſe of various fantaſtical forms and devices, and as variouſly accoutred, form a part of the ſhew on this occaſion; which is deſcribed as one of the moſt ſuperb and magnificent in the world, by an eye-witneſs, in 1755. Gent. Mag. vol. xxix. p. 263.

CORMEILLES, in *Geography*, a ſmall town of France, in the department of Eure, and diſtrict of Pontaudemer, with 1230 inhabitants. It is the chief place of a canton, which has 15 communes, and 10,063 inhabitants, on a territorial extent of 127 kiliometres.—Alſo, a town of France, in the department of the Oiſe, and diſtrict of Clermont; 4 miles W.N.W. of Breteuil.

CORMERY, a town of France, in the department of the Indre and Loire, and diſtrict of Tours; 7 miles S.E. of Tours.

CORMICY, a town of France, in the department of the Marne, and diſtrict of Reims; 10 miles N.W. of Reims.

CORMION, or Liconium, in *Ancient Geography*, a town of Aſia Minor, ſituated on the Boſphorus of Thrace, and near the weſtern bank of the river Aneretus. This ſmall town lay to the eaſt of the Hermæan promontory.

Cormion *Sinus*, a gulf of Aſia Minor, in the Boſphorus of Thrace, over againſt the Hermæan promontory.

CORMOLAIN, in *Geography*, a town of France, in the department of the Calvados; 10 miles S.S.W. of Baveux.

CORMONS, a town of Germany, in the county of Goritz; 7 miles S.W. of Goritz.

CORMORANT, in *Ornithology*. See PELECANUS *carbo*, and CORVUS *aquaticus*.

CORMOS, or CORMON, in *Ancient Geography*, a town of Arcadia, on the frontiers of Laconia, near the ſource of the river Carrion, S.E. of Megalopolis. In the time of Pauſanias, its ruins only were to be ſeen.

CORN, in *Agriculture*, a term applied to all ſorts of grain fit for food; particularly wheat, rye, &c.

The farmers, indeed, rank under the denomination of corn ſeveral other grains; as barley, oats, and even pulſe; as peas, vetches, &c. which, however, they ſometimes diſtinguiſh by the denomination, *ſmaller corn*.

Europe, in every part of it; Egypt, and ſome other cantons of Africa, particularly the coaſts of Barbary; and ſome parts of America, cultivated by the Europeans; and the Armenians themſelves, produce corn. Other countries have maize and rice, in lieu of it; and ſome parts of America, both in the iſlands and continents, ſimple roots, ſuch as potatoes, and manioc.

Egypt was anciently the moſt fertile of all countries in corn; as appears both from ſacred and profane hiſtory. It furniſhed a good part of the people ſubject to the Roman empire, and was called the dry nurſe of Rome and Italy. England, France, and Poland, ſeem now to have ſupplied the place of Egypt, and with their ſuperfluities ſupport a good part of Europe.

For the firſt diſcovery and culture of corn, authors are much divided: the common opinion is, that in the firſt ages men lived on the ſpontaneous fruits of the earth; as acorns, and the nut, or maſt, produced by the beech; which, they ſay, took its name, *fagus*, from the Greek φαγω, *I eat*. It is added, that they had not either the uſe of corn, nor the art of preparing, or making it eatable. See BAKING.

Ceres has the credit of being the firſt that ſhewed the uſe of corn, on which account ſhe was placed among the gods; others give the honour to Triptolemus; others ſhare it between the two, making Ceres the firſt diſcoverer, and Triptolemus the firſt planter and cultivator of corn.

Diodorus Siculus aſcribes the whole to Iſis; in which Polydore Virgil obſerves, he does not differ from the reſt; Iſis and Ceres being, in reality, the ſame. The Athenians pretend, it was among them the art began; and the Cretans, or Candiots, Sicilians, and Egyptians, lay claim to the ſame. Some think the title of the Sicilians beſt ſupported, that being the country of Ceres; and authors add, ſhe did not teach the ſecret to the Athenians, till ſhe had firſt inſtructed her own countrymen. Others ſay, Ceres paſſed firſt into Attica, thence into Crete, and, laſt of all, into Sicily: many of the learned, however, maintain, it was in Egypt the art of cultivating corn firſt began; and it is certain, there was corn in Egypt and the Eaſt, long before the time of Ceres. For the various modes of producing corn, and preparing it for uſe; ſee HUSBANDRY, and other articles appropriate to each kind of grain in this dictionary. For the beſt method of preſerving corn, ſee GRANARY.

CORN *Laws*, in *Rural* and *Commercial Economy*, are thoſe laws and regulations which relate to the importation and exportation, as well as general trade in grain. They are a ſet of rules and regulations which have undergone much change and alteration at different periods, but which ſtill ſeem far from having attained that degree of perfection which is eſſential in ſo important an article of commerce. It has been remarked by an able writer, that "almoſt every other manufacture may be admitted to a free trade; but as the trade of corn muſt at all times be limited by, and ſubſervient to, the neceſſities of the ſtate, it requires the attention of a careful and foſtering parent." It is therefore contended, that the agriculture of the nation "ought to be guarded by the wiſeſt laws and the ſtricteſt execution of them, as the only certain means of employing the greateſt number of people, and conſequently of encreaſing the population; and that it is the better entitled to this attention, that the farmer and the landholder pay a full proportion of all taxes impoſed for promoting and protecting the ſale of our other manufactures, both at home and abroad, as well as for the growth of corn at home."

Though very different principles have been laid down as the baſis of theſe laws at different times, it ſeems evident that, as the ſtrength and power of a nation muſt be proportioned to the extent and induſtry of its population, the chief attention of the framers of them ſhould be directed to ſuch meaſures as have an immediate tendency to encourage and promote the improvement of agriculture. It has indeed been contended, on the ground of long experience, that the foundation of ſuch regulations ſhould always be ſuch as is calculated to induce the inhabitants to improve their grounds in ſuch a manner as to raiſe the largeſt proportion of grain, the particular ſoil and climate is capable of permitting. And that this is "an object which can only be attained by ſecuring a certain and ſteady market to the farmer for his produce; not only by preventing importation, but alſo, whenever it ſhall appear, from the moderate price of grain at home, that a greater quantity has been raiſed than is required for the annual ſupply of the inhabitants, by giving ſuch a bounty on exportation, as ſhall enſure a ready vent for the excreſcent ſtock in foreign countries. It is not enough, ſays the able writer, that a nation raiſes, in general, a ſufficiency of corn for the conſumption of its inhabitants: it muſt be accuſtomed to raiſe conſiderably more, in order to afford plenty in bad ſeaſons; and its annals ought to be diſtinguiſhed by a greater or leſſer *exportation*; but on no occaſion ought it be reduced to the neceſſity of *importation*, and having recourſe to foreign countries for an expenſive and precarious relief."

Mr. Young in his "Political Arithmetic" likewiſe remarks, in ſpeaking of the obſtacles which bad corn laws throw in the way of good huſbandry, and of the want of permiſſion to export grain in Spain, Portugal, and ſome parts of Italy, that he does not conceive it poſſible, "under ſuch a ſyſtem, to have a flouriſhing corn huſbandry—prices will be too fluctuating—ſome years will be ſo cheap that the farmers will be ruined, and others ſo dear that the people will be ſtarved. Long experience muſt convince us, continues he, that this is not only reaſoning but fact. Famines never appear in countries that admit a free exportation; but in all above named, where a contrary policy has been purſued, they have appeared frequently and ſeverely." And he farther obſerves that "the variations in the earth's products, owing to ſeaſons, though not ſo great as ſome have imagined, where the huſbandry is good, yet where it is indifferent, muſt neceſſarily be conſiderable." He thinks that one maxim may be laid down on this ſubject which can hardly be contradicted, which is, that "the good of huſbandry requires that the price of corn ſhould be proportioned to the product. Let us then, adds he, ſuppoſe the common conſumption of a nation to be 5,000,000 of quarters of bread corn: the proportion between the common product and the common conſumption muſt vibrate according to various circumſtances.—Suppoſe a crop of 6,000,000 of quarters, and no exportation, what, he aſks, muſt be the conſequence? There is the ſurplus of a ſixth in the markets, conſequently the price is brought down much lower than that proportion. Here, ſays he, lies the misfortune. If corn in ſuch a year yielded a price proportioned only to the plenty, the misfortune would not be great; but the addition in the markets of a ſixth ſinks the price probably a third, and perhaps more." And further, ſuppoſing "another good crop, with a new ſurplus of a ſixth or ſeventh; this coming upon granaries full of a part of the former ſurplus, ſinks the price yet lower; and then the farmers are not only diſcouraged, as, he ſays, ſeveral writers have obſerved, from ſowing another crop, but what is as bad, they are impoveriſhed ſo much that they cannot plough, harrow, dung, drain, ditch, fence, or do any thing with proper ſpirit. Theſe two circumſtances, inability in future to act well, and diſcouragement from ſowing again, can hardly fail, he thinks, of occaſioning in future years a ſcarcity, or probably a famine. Then the farmers reap of courſe a thin crop, from their former inability, and that too over only part of the land uſually ſown; in ſuch a caſe, corn, he contends, muſt be very high to recompenſe the farmer; probably ſo high, that the government of the country is alarmed, and imports corn from wherever they can get it; then the price falls, when he again ſuffers. Thus a great crop or a bad one operates equally againſt him, and nothing can ſupport him at all but ſuch a product as pretty exactly anſwers the annual conſumption. There is no balance preſerved in the meaſures, exportation is prohibited, yet importation is allowed; ſo that it is impoſſible the price ſhould with any regularity be ſuch as can encourage good huſbandry."

"On the contrary, if the policy of the ſtate admits exportation, the ſurplus of a large crop being ſent away, keeps the price at home, he maintains, from falling too low: this is an encouragement to the farmer acting two ways; firſt, by enriching him, he is able the better to improve all his culture; ſecondly, he is induced to ſow as much corn as poſſible, for every man, whatever be his trade, is deſirous of increaſing that commodity which ſells beſt at market."

The bounty on exportation, which was formerly given in this country, is conſidered as a refinement on this policy, and which, though given originally with the view of raiſing the price of grain, as an encouragement to the country gentlemen, yet it had the contrary effect, having rendered corn much more cheap, by becoming ſo great an inducement to the cultivation of it.

It is, in ſhort, ſtrongly contended, that "in ſuch countries as will adhere to ſo deſtructive a ſyſtem as that of reſtraining the export of corn, it is not of much conſequence whatever advantages are given to huſbandry, ſince all others united, that can be named, or thought of, will not make amends to the farmer for the want of a market: it is of no conſequence to enable him to raiſe noble crops, if when he has got them, he cannot ſell at a proper price; his plentiful harveſts tend only to his ruin."

From the fulleſt conſideration of the ſubject in various points of view, an able writer conceives it obvious, "that agriculture and manufactures are eſtabliſhed on very different principles, and that whilſt wealth and population raiſe conſiderably the money price of corn, and other rude produce of the ſoil, they have not an equal effect in advancing the price of manufactures." Hence, contrary to the opinion of the celebrated author of the Wealth of Nations, it is ſuppoſed the following political maxim may be fairly deduced: "that agriculture in rich and populous countries, ſtands more in need of a monopoly for its ſupport than manufactures; and that the farther a nation advances in proſperity, it becomes the more neceſſary to ſecure its agriculture, not only by reſtraining the importation of foreign corn, but alſo by removing every impediment which may prevent, and by giving every encouragement which may promote, the extenſion of cultivation and improvement over the whole face of the country."

Conſequently, that, if this country wiſh "to preſerve her preſent ſuperiority in wealth and reſources over the ſurrounding nations, agriculture muſt be protected by allowing to the huſbandmen prices for their produce proportioned to the internal wealth and proſperity of the country; and that, if at any time, the bringing in of foreign corn tends to ſink the money price of Britiſh grain below the correſponding value of labour and other commodities, the importation muſt be checked by judicious laws, altered from time to time, at different periods, to correſpond with the proſperous or declining ſtate of the country."

The principles on which the corn laws have been conſtructed at different times, ſo far as they can be traced and recognized, appear to have been theſe.

1ſt. That of cutting off the importation of corn from foreign countries, except when the price at home was very high.

2d. That of granting a bounty on the exportation of it, when it does not exceed certain prices.

3d. That of having recourſe to both theſe meaſures according to circumſtances; or what may be termed a ſort of mixed or ſhifting policy, without any thing being permanent, without any regular law, or due arrangements of prices at which export ſhould be allowed, or import be prohibited.

4th. That of lowering the import rates and duties, as well as that of the bounty, on exportation in a conſiderable degree, in order to reduce the prices of corn in the home market, to the ſtate of former periods, and thus to introduce a permanent law in reſpect to corn by which the inconveniences of a varying policy may be remedied. And,

Laſtly, That of regulating the import and export of corn, and the bounties and duties upon them, by the particular circumſtances of the period, ſo that the farmer may obtain a fair and reaſonable profit in the home market.

Having now conſidered the different objects which ſhould be particularly attended to in conſtructing laws for the regulation of the commerce in grain, and ſhewn the principles on which they ſeem to have been in general founded, it may not be improper to trace the cauſes from which they proceeded, and the effects which they have produced at different times.

In regard to the corn laws of this country, as they exiſted previous to the revolution in 1688, it may be obſerved, that in order to preſerve the laws of the kingdom in force, it was conſidered neceſſary, for ſeveral centuries after the conqueſt, to renew or confirm them upon the acceſſions of new ſovereigns, a practice which explains the reaſon of the various confirmations of the great charter, and the frequent re-enactions of the ſame laws, on this ſubject, as well as others, without any new meaning appearing on the ſtatute-book.

At this period, the rents of lands, held by farmers or tenants, were for the moſt part payable in produce, as in corn, cattle, or ſome other product afforded by the ſoil. And the rules by which the rents were received were extremely indefinite and irregular; the meaſures of grain being various, and taken heaped, nine buſhels generally conſtituting the quarter. For though by the great charters of king John and Henry III., which had been often confirmed by ſucceeding kings and their parliaments, one weight and meaſure had been directed to be made uſe of over all England, yet it was far from being the caſe, as is ſhewn by an act of 1360, the 25th of Edward III., in which the weights and meaſures are again attempted to be regulated; and in which it is directed, that eight buſhels ſtricken and no more, ſhall be received as the quarter of grain, "but ſaving the rents and farms, and all manner of franchiſes of the lords." On which Mr. Dirom remarks, that, "with ſuch reſervations, it is not to be expected that the law could have any effect." And he adds, that, "under ſuch impoſitions with the oppreſſion of purveyance, and the depreſſed ſituation in life wherein the farmers were placed, it is not to be wondered that agriculture languiſhed, and that a numerous community depended upon foreign proviſions for their ſubſiſtence."

In tracing the progreſſive advances of agriculture from this depreſſed ſituation, it may be neceſſary to obſerve, that, at theſe periods, moſt of the buſineſs of the dealer or trader was carried on in the different markets and fairs of the kingdom, and that a large proportion of the revenue of the crown was drawn from the duties payable to the king, on the goods brought to them in order to be ſold. And the barons had likewiſe, within their reſpective juriſdictions, tolls at the fairs. Hence it not unfrequently happened, that as the farmers and other dealers were conveying their corn and other neceſſaries to the markets and fairs to be diſpoſed of, they were met by perſons on the road, in order to purchaſe them for the purpoſe of retailing them at a higher price, in conſequence of which, the king and the lords of the manors were deprived of the different duties payable upon them, and at the ſame time the price was inhanced on the people, in conſequence of the diminiſhed quantity brought to market. It of courſe became neceſſary, both on the ſcore of public and private intereſt, to prevent the practice as much as poſſible, by the infliction of ſevere penalties; and various laws were enacted for the purpoſe at different times, the offenders being termed foreſtallers, regrators, and ingroſſers.

Hitherto, as various laws had been formed with the view of inviting the importation of foreign articles of neceſſity, while the exportation of the ſuperabundant ſtock of Britiſh grain had been prohibited, it cannot be ſuppoſed that agriculture had been encouraged as an object of national importance. About this period, 1393, however, a law was made, the 17th Richard II. c. 7, which authorized all the king's ſubjects to carry corn out of the kingdom, upon the payment of the cuſtoms and ſubſidies. And which was confirmed in 1425, reſerving to the king and council, power to reſtrain the exportation when they ſhould judge it neceſſary.

However, from this reſervation being conſtrued into a prohibition to export grain without a licence, or from the difficulty of procuring the licence, the beneficial conſequences to be derived from it were prevented; and from the check which was thus given to the art of cultivation, much inconvenience and diſtreſs experienced in the country, as is fully ſhewn by the preamble to the law of 1436, the 15th Henry VI. c. 2, by which it was followed, and in which liberty was given to perſons to tranſport grain, without a licence to wherever they choſe, except to the enemies of the king, when wheat was at 6*s.* and 8*d.* and barley at 3*s.* the quarter; which were ſums rather above the medium prices, being in the proportion of the preſent money of 2*l.* 4*s.* for the quarter of the former, and 19*s.* 10*d.* for that of the latter.

The advantage of this law had been found ſo beneficial to the country in reſtoring abundance of grain, that it was in 1442 and 1444, confirmed and continued for ten year as well as ſoon afterwards made perpetual, by the acts of 20 Henry VI. c. 6. and 23 Henry VI. c. 5: and the effects of which, ſo far as they can now be diſcerned, were thoſe of a very moderate and more ſteady, or leſs fluctuating, price of corn for forty years.

However, notwithſtanding this, the laws favouring the importation of foreign grain ſtill continued in force; and the trade was in the hands of foreign merchants or dealers, who conveyed their corn or other articles from one port to another, ſo as to anticipate the Engliſh farmers in the ſale and diſpoſal of their grain or other produce. And it is ſuggeſted by Mr. Dirom in his "Inquiry into the Corn Laws and Corn Trade," that, "although thoſe merchants may have loſt upon the grain which they imported into England at this time, they gained upon the general courſe of the trade; becauſe they received in return, wool, unfiniſhed woollen cloth, and ready money, upon which they made great profit in their own countries, and thus were enabled to underſell the produce of our fields at home."

Further, "this appears to have been the caſe, even after this period, from two reſtrictive and regulating laws of Richard III. 1, c. 8, 13, by the laſt of which it appears, that the foreign merchants who imported wines into England, had not only taken their payment two-thirds in woollen cloth, and one-third in ready money, but had conſiderably leſſened the contents of their wine caſks, although ſold under the former titles and contents."

The inconvenience and conſequent diſtreſs to which the buſineſs of cultivation was expoſed, by the conſtant importation of foreign grain, at length awakened the attention of the legiſlature, and in 1463, a preventive law was made, 3 Edward IV. c. 2; ſome of the cauſes of which ſeem to have been, that the labourers or cultivators and occupiers of land, had been grievouſly injured by the importation of foreign grain, when corn at home was at a low price; by which the importation of foreign grain was prohibited, until the prices at home ſhould exceed 6*s.* 8*d.* the quarter for wheat, 4*s.* for rye, and 3*s.* for barley; which is in the proportion of 1*l.* 15*s.* 2*d.* 1*l.* 1*s.* and 15*s.* 10*d.* of the preſent money.

The able author quoted above, conſiders theſe as the laws to which the agriculture of this country owes its origin; and that notwithſtanding their objects have frequently been defeated by others, they are the baſis or foundation which ſtill remains; and on which a great fabric, now out of repair, has been erected; but which, by "moderate attention, may long continue to be the chief ornament and ſupport" of the kingdom. It was on theſe laws, he adds, that the agriculture of the country reſted for nearly a century; though the want of their being duly executed, rendered them in a conſiderable degree nugatory. For as the prohibition of the importation of foreign grain, was never ſufficiently regarded; the occupiers of land had ſtill to contend with the competition of grain from abroad as well as other oppreſſions and grievances at home; as is fully ſhewn by an act made in the year 1552 againſt regrators, foreſtallers, and ingroſſers, the 5 and 6 of Edw. VI. c. 14; "by which the crime of foreſtalling is extended to perſons buying victuals coming in ſhips from beyond the ſeas, to be ſold in any market or fair, city, port, haven, creek, or road, as if no laws had ſubſiſted by which ſuch importation had been prohibited." And after obſerving that although the "repreſſion of the practices of foreſtalling and regrating might have been neceſſary," it is not eaſy to diſcover any cauſe "for the enactment of ingroſſing" at a period ſo late as this when commerce had made ſuch conſiderable advances: and further that, "by the ſame law, no perſon at home could tranſport corn from one port to another without a licence; neither could they purchaſe corn to be laid up in their granaries for home ſale, until the quarter of wheat was at, or under, 6*s.* 8.*d.* (equal to 16*s.* 6*d.* of preſent money): malt and barley at 3*s.* 4*d.* (8*s.* 3*d.*); oats at 2*s.* (4*s.* 11½*d.*); peaſe and beans at 4*s.* (9*s.* 11*d.*): and rye at 5*s.* (12*s.* 5*d.*) per quarter."

By theſe means it is contended that the former ſyſtem of corn laws was wholly ſubverted, for that, "although theſe were the prices to which exportation was limited by the act of Edward IV. in 1463, the value of money was materially changed; for, at the former period, there were only 37*s.* 6*d.* in the pound of ſilver, and now there were 60*s.* and at the former period, money bore a very high and unlimited intereſt, and now, it yielded only about 12 *per cent. per annum*; ſo that 6*s.* 8*d.* for a quarter of wheat, in 1463, was equal to 1*l.* 15*s.* 2*d.* and in the year 1552, it was only equal to 16*s.* 6*d.*" as has been noticed above. And further that the prohibition to the purchaſing of grain for ſtoring up or conveying coaſt-ways, till the price ſhould ſink beneath the expence of raiſing it, muſt have neceſſarily put a total ſtop to all dealings in grain and of courſe ruin the farmers; all of which was done at a period when the price of corn had been invariably at a low ſtate. It is ſuppoſed not to have occurred to the legiſlature at this period, that by keeping the grain at home in ſeaſons of great plenty the price muſt be inhanced, as the farmers would not be capable of continuing their trade of raiſing grain under ſuch diſadvantageous circumſtances; of courſe, that as ſoon as the ſtock on hand was conſumed, ſcarcity if not famine muſt be the conſequence; nor that by permitting an exportation of the excreſcent ſtock, plenty would be enſured, by preſerving an open market to the farmers, and in that way enabling them to carry on their buſineſs, and raiſe more grain than was in general neceſſary for the home conſumption: nor was the benefit that would ariſe to the nation, from the increaſed number of perſons who might be engaged in raiſing and exporting the quantity of corn that could be ſpared, or the ſums of money which would be brought into the country as the price of it, in the leaſt attended to.

It ſeemed to have proceeded on the idea that the only mode of preſerving plenty, was that of keeping the whole of the corn and other proviſions at home, and importing as much as poſſible from abroad, which appears from experience to be far from having any foundation in truth.

However, the ſame ſyſtem was farther enforced and followed out by the enacting of another law this year 1554, 1 & 2 Phil. & Mary, c. 5. under the ſuppoſition of injury from the exportation of corn and other victuals; by which it was provided that "no manner of perſon or perſons ſhould export any wheat, rye, barley, or other ſort of grain, growing within England; or any malt made within the ſame; or any butter, cheeſe, herring, or wood, without having licence ſo to do, under ſevere penalties; except when the common price of corn, within England, ſhould not exceed for wheat 6*s.* 8*d.* (equal to 16*s.* 6*d.* of preſent money): rye 4*s* (9*s.* 11*d.*) and barley 3*s.* (7*s.* 5*d.*) per quarter.

Such was the policy of Edward IV. as well as of Philip and Mary, notwithſtanding the price of wheat this and ſeveral years before, had been only 8*s.* the quarter (equal to 19*s.* 10*d.* of preſent money); and the export prices below the medium ones in times of ordinary plenty; and in Scotland it was ſoon afterwards followed by laws expreſsly prohibitory under very ſevere penalties of the exportation of all ſorts of victuals, tallow, and fleſh. Mary par. 6. c. 40. Jas. par. 11. c. 55.

After the enacting of this law, from the ſeaſons being favourable and the importation of foreign grain being continued, though the price of wheat remained about 8*s.* the quarter; the farmers became ruined, and the buſineſs of cultivation much relinquiſhed; which ſtrongly marks the abſurdity of directing perſons to labour in occupations in which they cannot procure a reaſonable ſubſiſtence. The excellent laws of Henry VI. and Edw. IV. had continued without repeal throughout the reigns of Henry VII. and VIII. without, however, being countenanced or having any execution, yet theſe ſovereigns, as well as Edw. VI. and Philip and Mary, made repeated laws to enforce the people to cultivate and ſow their grounds, 4 Hen. VII. c. 19. 7 Hen. VIII. c. 1. 27 Hen. VIII. c. 22; 5 and 6 Edw. VI. c. 15. 2 and 3 Phil. and Mary c. 2. thoſe of the latter being particularly prejudicial in repreſſing the ſpirit of huſbandry.

Theſe inconſiſtencies did not however eſcape the attention of Elizabeth, as almoſt immediately upon her acceſſion ſhe not only renewed the laws which formerly exiſted for rebuilding farm houſes, and tilling the land formerly in cultivation with greater vigour, 5 Eliz. c. 2. but by another law 5 Eliz. c. 5. § 26. permitted farmers to export their corn as merchandize, when the price was not high at home, as when wheat did not exceed 10*s.* the quarter, equal to 1*l.* 8*s.* of preſent money, rye, peas or beans, 8*s.* (16*s.* 7*d.*) barley and malt 6*s.* 8*d.* (13*s.* 10*d.*) And as in the former of theſe laws, the penalties had been given to the king, they were now given to the next heir, &c. of the perſon offending. By this means a conſiderable extenſion of the exportation prices took place, which is remarked by the beſt writers of that period to have had a direct and immediate effect in the increaſe of tillage and the reduction of importation, though it had been obſerved by one of them that for ſeveral years preceding that time, "the importation of grain had exceeded forty-five millions of livres." Theſe are probably the firſt traces of the navigation laws.

Not long after this, in 1570, a ſtill more vigorous effort was made to reſtore the agriculture of the country, in a law enacted for the better increaſe of tillage, &c. 13 Eliz. c. 13. by which exportation was permitted, without limitation of prices, from ſuch ports and creeks, in which a cuſtomer or collector of the ſubſidy of tonnage and poundage, had been placed, to any part beyond the ſeas in amity with England, when not reſtrained by proclamation, provided ſuch exportations were made in ſhips belonging to Engliſh born ſubjects reſiding within the dominions; at ſuch times as the ſeveral prices of grain ſhould be ſo reaſonable and moderate, when ſuch exportations were intended, as that no prohibition ſhould be made by the queen's proclamation, or by the preſidents of the North, or of Wales, within their ſeveral juriſdictions; or of the juſtices of aſſize at their ſeſſions, in other ſhires out of the juriſdiction of the ſaid two preſidents and councils; or by the major part of the juſtices of peace of the county at their quarter ſeſſions. Thus, theſe different magiſtrates were to annually confer and deliberate with the inhabitants of the county concerning the prices of the different ſorts of corn within their juriſdictions, in regard to its cheapneſs or dearneſs, and by their diſcretion decide whether it would be meet, at any time, to prevent any grain from being carried out of the realm, by any port within their juriſdictions or limits, and by a writing under their hands and ſeals, make a determination, either for permiſſion or prohibition, and cauſe the ſame to be publiſhed by the ſheriffs of the ſeveral counties; which was to continue in force until the ſame ſhould be altered, by the ſaid preſidents and councils, or other powers reſpectively, except the ſame ſhould, in the mean time, be countermanded by the queen, her heirs or ſucceſſors; or by ſome order of the juſtices of peace, in the counties ſituated out of the juriſdiction of the ſaid two councils, in their quarter ſeſſions to be holden in the mean time, or the greateſt part of them, ſhould find the determination of the juſtices of aſſize to be hurtful to the country, in conſequence of the dearth, or a great hindrance to tillage, in conſequence of the great cheapneſs; which determination was in like manner to be publiſhed, and continue in force until a new regulation ſhould be made; except the ſame ſhould in the mean time be altered by the queen, her heirs or ſucceſſors: provided always, that theſe preſidents &c. ſhould not publiſh their determinations, until the ſame was firſt notified to, and approved by, the queen, or her privy council; and that the cuſtom or poundage be paid upon exportation: provided likewiſe, that the queen, her heirs and ſucceſſors, might at all times by proclamation, prohibit exportation, either generally from all the ports of the realm, or particular ports only.

Mr. Dirom ſuppoſes the corn trade, in this caſe, to have been conſidered in a ſcientific manner; and that if the plan marked out had been properly digeſted and modified, as well as the duties upon exportation removed, there could have been no doubt of the act producing the moſt beneficial conſequences to the kingdom; but the judges, to whom this important buſineſs was intruſted, had no certain rule by which to direct their proceedings, not being permitted to determine, by the price of grain at the time of their annual inquiry, the only certain index of plenty or deficiency, but ſimply upon a conference with the people of the country, to decide whether it would be hurtful to the kingdom, from the dearth, or a great hindrance to tillage, from the too great cheapneſs, to admit the exportation of corn, than which, he thinks, nothing could be more vague and uncertain. But further that, "whatever conſideration might have been given to the framing of this act, the laying a duty of twenty *per cent. ad valorem* upon grain to be exported by licence, and ten *per cent.* upon grain to be exported by the ſtatute, was equal to prohibition, and gave full ſcope to the importation of foreign grain, which was ſtill (he ſays) received without the payment of any duty."

However, "in Scotland, the prohibition to export grain to foreign parts was continued under ſevere penalties;" as by Jas. 6. par. 11. c. 55.

Judging concerning the effects of the preceding law of England, from the prices of grain immediately ſubſequent to it; they do not ſeem to have been favourable, as the price of the quarter of wheat in 1574 was 2*l.* 16*s.* equal to 5*l.* 15*s.* 8*d.* of preſent money; and in 1587 not lower than 3*l.* 4*s.* equal to 6*l.* 12*s.* 8 *d.*

In 1593, the corn laws ſeem to have again undergone a ſort of reviſion, though the reaſon is not by any means explained; but they are taken notice of in an act, the 35 Eliz. c. 7. made for the adjuſting of other acts, and which is entitled, "An Act for reviſing, continuance, explanation, and perfecting of divers Statutes:" by which it would ſeem, that the abſurd and impracticable ſcheme of forcing the people to labour or cultivate their land, whether they could live by ſuch means or not, had been given up; as the act paſſed in the 5th of the preſent reign was now repealed, and the plan laid down by that of the 13th appears likewiſe, from other circumſtances, to have been relinquiſhed, though the act itſelf is neither mentioned nor repealed, as the reſolutions of the legiſlature are found to be changed by the 23d ſection of the preſent act: by which exportation was permitted, when wheat was at 20*s.* the quarter (equal to 2*l.* 1*s.* 4*d.* of preſent money); rye, peaſe, and beans, at 13*s.* 4*d.* (1*l.* 7*s.* 8*d.*); and barley and malt at 12*s.* (1*l.* 4*s.* 10*d.*); which are exactly double the prices at which exportation was permitted by the former law of the 5th. However, at the ſame time, the duties payable upon corn, exported by force of the ſtatute, were doubled; which, together with an unlimited importation, without the payment of any duty whatever, amounted to a prohibition, and conſequently rendered the act nugatory, keeping the price of grain at an extravagant height; as, in 1594, the quarter of wheat ſold at 2*l.* 16*s.*, equal to 5*l.* 15*s.* 8*d.*; in 1595, at 2*l.* 13*s.* 4*d.*, equal to 5*l.* 10*s.* 2*d.*; in 1596, at 4*l.*, equal to 8*l.* 5*s.* 4*d.*; and in 1597, at 4*l.* 12*s.*, equal to 9*l.* 10*s.* of preſent money.

The laws concerning grain continued, however, in this ſituation till 1604, when, on the acceſſion of James I. to the crown, various ſtatutes were reviſed; ſome continued, and others repealed, without any ſpecific reaſon being given; and one was enacted in reſpect to grain, the 2 Ja. I. c. 25. § 26, 27. by which the exportation prices were conſiderably increaſed; namely, when the quarter of wheat was at 26*s.* 8*d.* (equal to 2*l.* 13*s.* 4*d.* of preſent money); the quarter of rye, peaſe, and beans, 15*s.* (1*l.* 10*s.*); the quarter of barley and malt, 14*s* (1*l.* 8*s.*); provided the grain was carried abroad in ſhips belonging to Engliſh born ſubjects; reſerving to the king, his heirs, and ſucceſſors, the power to reſtrain, by proclamation, the exportation from the realm in general, or from particular places. But from exportation being ſtill, under this act, encumbered with duties, it is obviouſly that the complete operation of it muſt have been greatly retarded or prevented.

And in another reviſing act of the ſame reign, 21 Ja. I. c. 28. § 3, 4. in the ſections relating to grain, the exportation prices were ſtill farther extended, under ſimilar terms with the former act; namely, the quarter of wheat at 32*s.*, the quarter of rye at 20*s.*, the quarter of peaſe and beans at 16*s.*, and the quarter of barley and malt at 16*s.*, of current Engliſh money. This extent of 32*s.* for wheat was equal to 3*l.* 4*s.* of preſent money; 20*s.* for rye, to 2*l.*; and 16*s.* for barley and malt, peaſe and beans, to 1*l.* 12*s.*: which different ſums are nearly double the medium prices of the preſent time, conſequently very great, having obviouſly the extenſion of revenue in view. Beſides this, the penalties for ingroſſing were obviated by this act, while the prices of grain did not exceed thoſe ſtated in it, which was become eſſentially neceſſary, in order to reſtore the internal as well as external trade in corn, which they had nearly put a ſtop to.

But the duties upon exportation having ſtill been kept up, the proper effects of the law could not be produced.

In 1627, not long after the acceſſion of Charles I., it was again renewed in exactly the ſame terms, 3 Cha. I. c. 5. § 24, 25. It is, however, remarked by Mr. Dirom, that "although the export prices were literally the ſame, they were very different in fact; for, in the year 1624, the yearly intereſt of money having been reduced from 10 to 8 *per cent.*, 32*s.* for a quarter of wheat, which, in 1623, was equal to 3*l.* 4*s.*, was, in 1627, equal to only 2*l.* 11*s.* 2*d.* of preſent money;" and ſo in proportion, in reſpect to the prices of other grain. It is conceived that the long interval of parliament, after the ſeſſion in which this act paſſed, and the confuſion which quickly ſucceeded the meeting of the following parliament, in 1640, were probably the cauſes of no farther attention having been had to the buſineſs during the remainder of the reign.

Though, from the unfortunate circumſtance of connecting the corn laws with the revenue, the excellent inſtitutions of the reign of Elizabeth, and thoſe of her two immediate ſucceſſors, had in a great degree been fruſtrated, agriculture had, in other reſpects, been treated by the laws as an object of much importance; not merely in the view of the numbers employed in it, or the intrinſic value of the produce which it afforded, but likewiſe in conſequence of the ſupport which would be given to the navy, from the export trade, ariſing from it. On the reſtoration of Charles II., however, it was inconſiderately abandoned, being treated merely as an object of revenue.

In the year 1660, without the leaſt reaſon being ſtated for any alteration in the corn laws, in a ſection of the act of tonnage and poundage, 12 Cha. II. c. 4. § 11, corn is conſidered in the ſame liſt or roll with other articles, on which duties are made payable. The exportation prices of grain were ſtill more extended; but the duties were raiſed ſo high, as to be equal to a prohibition. Importation was alſo permitted; but the duties here likewiſe operated as a prohibition. The prices ſet for the exportation of wheat being 40*s.*, equal to 2*l.* 8*s.* of preſent money; 24*s.* for the quarter of rye, peaſe, and beans, equal to 1*l.* 8*s.* 10*d.*; 20*s.* for the quarter of barley and malt, equal to 1*l.* 4*s.*; and 16*s.* for the quarter of oats, equal to 19*s.* 2*d.* And further by this act, the duties payable on exportation were 20*s.* for the quarter of wheat, equal to 1*l.* 4*s.*; 10*s.* for the quarter of rye, peaſe, beans, barley, malt, and buck wheat, equal to 12*s.*; and 6*s.* 8*d.* for the quarter of oats, equal to 8*s.* And by the ſame act, the rates inward, or duties on importation, were thus regulated: for the quarter of wheat, when the price, at the place of importation, did not exceed 44*s.*, equal to 2*l.* 12*s.* 10*d.*, the ſum of 2*l.*, equal to 2*l.* 8*s.*; and when it exceeded that price, 6*s.* 8*d.*, equal to 8*s.* of preſent money. For the quarter of rye, when not exceeding in price as above, 36*s.*, equal to 2*l.* 3*s.* 2*d.*, the ſum of 1*l.* 6*s.* 8*d.*, equal to 1*l.* 12*s.*; and when it exceeded that price, 5*s.*, equal to 6*s.* of preſent money. For the quarter of peaſe, beans, barley, and malt, not exceeding in price as above, 1*l.* 6*s.* 8*d.*, equal to 1*l.* 12*s.*, the ſum of 1*l.* 6*s.* 8*d.*, equal to 1*l.* 12*s.*; and when it exceeded that price, 5*s.*, equal to 6*s.* of preſent money. Conſequently, Mr. Dirom obſerves, that until the price of wheat *per* quarter was higher than 2*l.* 12*s.* 10*d.* of preſent money, and that of other grain in proportion, from the importation high duties acting as a prohibition, and exportation being in fact prohibited, prices would quickly riſe, and bring the country to import at the low duties; a circumſtance which, he ſays, accordingly happened: "for, in 1660, the quarter of wheat ſold at 2*l.* 16*s.* 6*d.*, equal to 3*l.* 7*s.* 9*d.* of preſent money;" "in 1661, it roſe to 3*l.* 10*s.*, equal to 4*l.* 4*s.*; and in 1662, to 3*l.* 14*s.*, equal to 4*l.* 8*s.* 10*d.* of preſent money." He adds, that theſe laws, in addition to their having raiſed the price of grain to an "extravagant height, had ruined many of the farmers;" and that agriculture declined, a great part of the lands lying without tillage or cultivation.

In conſequence of this, the corn laws were again taken into conſideration in 1663, the preamble to the act concerning which, 15 Cha. II. c. 7. § 1, 2, 3, 4, ſufficiently ſhews the deplorable ſtate into which huſbandry had fallen; and it would ſeem that the legiſlature was now ſeriouſly anxious to afford it encouragement. By this law, the exportation prices were extended beyond their former limits: that of the quarter of wheat being fixed at 48*s.*, equal to 2*l.* 17*s.* 7*d.* of preſent money; the quarter of buck wheat, barley, or malt, 28*s.*, equal to 1*l.* 13*s.* 7*d.*; the quarter of oats, 13*s.* 4*d.*, equal to 16*s.*; the quarter of rye, peaſe, and beans, 32*s.*, equal to 1*l.* 18*s.* 5*d.* current Engliſh money: but the exported grain being ſtill ſuffered to continue loaded with nearly 50 *per cent.* of duties, it operated as a prohibition.

While, on the contrary, the high duties on importation were removed, and when the prices of grain did *not* exceed the ſame rates limited for exportation, or when grain was at the loweſt price, importation was allowed, on the payment of about 9 *per cent.* of duties *ad valorem*, which were much lower than the low duties fixed by the act of tonnage and poundage. Theſe duties were, for every quarter of wheat, 5*s.* 4*d.*, equal to 6*s.* 5*d.* of preſent money; for every quarter of rye, 4*s.*, equal to 4*s.* 10*d*; for every quarter of barley or malt, 2*s.* 8*d.*, equal to 3*s.* 2*d.*; for every quarter of buck wheat, 2*s.*, equal to 2*s.* 5*d.*; for every quarter of oats, 1*s.* 4*d.*, equal to 1*s.* 6*d.*; and for every quarter of peaſe and beans, 4*s.*, equal to 4*s.* 10*d.*

By the introduction of the monoſyllable *not*, in the clauſe of the act which relates to importation, it is obſerved, the meaning of the whole was perverted; as it never could have been the deſign of the framers of the act to allow importation at low duties, till grain had riſen above the prices fixed for exportation; as, until that riſe, the prohibition to ingroſs was taken off, and ſimilar reaſons influenced both caſes.

This is rendered ſtill more probable by a law of Scotland, Cha. II. par. 1. ſeſſ. 3. c. 12. 14. of the ſame year; in which the powers of exportation were extended, reſerving to the king and privy council to reſtrain or prohibit it as they ſhould judge neceſſary; while a duty of about 40 *per cent. ad valorem* was laid upon grain imported, when the prices did not exceed thoſe of exportation, namely, for ilk boll of wheat, under 12*l.*, equal to 1*l.* 4*s.* of preſent money; bear and barley, under 8*l.*, equal to 16*s.* the boll; and oats and peaſe, under 8 *merks*, equal to 10*s.* 8*d.* the boll; with power to the king and council to remit the duties, if the prices ſhould riſe.

In this caſe Mr. Dirom contends, that "the Scotch parliament clearly took the lead in the liberal and wiſe exerciſe of their powers, for the encouraging of agriculture, and thereby procuring plenty and cheapneſs of proviſions." He adds, that "they permitted the exportation of all ſorts of grain, when the prices at home were moderate, upon payment of a ſmall duty; and as long as the prices remained in that ſituation, the duties payable upon importation were equal to a prohibition: and they gave unlimited powers to export cattle, and barrelled fleſhes of all kinds, without the payment of any duties: while, in England, importation was permitted, when the price of corn at home was at the cheapeſt rate, upon payment of a low duty; and the duties upon exportation, when the price of corn was in the ſame ſituation, amounted to a prohibition."

And in 1669, the parliament of Scotland, from reconſidering the ſubject, and finding that the exportation of corn had been impeded by the duty payable upon the ſame, now removed all duties, except a merk the chalder, equal to 1*s.* 4*d.* of preſent money, payable upon corn exported, when the prices at home did not exceed thoſe ſtated in the act of 1663. Cha. II. par. 2. ſeſſ. 1. c. 14. And in order to prevent any debates that might ariſe concerning the reſpective prices of victual, when the ſame were under or above the rates expreſſed in the ſaid act, they recommended to, and authorized, the lords of the privy council to determine the ſame; declaring that it ſhould be lawful for his majeſty's ſubjects to export corns of all ſorts, unleſs prohibited and diſcharged from doing the ſame, by a proclamation or public intimation from the ſaid lords of council.

In 1670, a reviſion of the corn laws again took place, probably in conſequence, as Mr. Dirom ſuggeſts, of the continual drain upon England for the payment of the price of the large quantities of grain imported; and by a law now paſſed,

paſſed, entitled, "An Act for Improvement of Tillage, and the Breed of Cattle, for the common Good and Welfare of the Kingdom," it was enacted as lawful for every perſon, native or foreigner, to tranſport, at any time, as merchandize, all ſorts of corn, although the prices exceeded the rates in the act of the 15th of the preſent reign; paying for the ſame the rates expreſſed in the act of tonnage and poundage. And that in caſes where the prices of grain, at the places of importation, ſhould not exceed the rates, as follows; there ſhould be paid for cuſtom theſe rates, namely, for every quarter of wheat, when the ſame ſhould not exceed 53*s.* 4*d.*, equal to 3*l.* 4*s.* of preſent money, the ſum of 16*s.*, equal to 19*s.* 2*d.*; when the ſame ſhould exceed 53*s.* 4*d.*, and not exceed 4*l.*, equal to 4*l.* 16*s.*, there ſhould be paid 8*s.*, equal to 9*s.* 7*d.*; for every quarter of rye, when the ſame did not exceed 40*s.*, equal to 2*l.* 8*s.*, the ſum of 16*s.*, equal to 19*s.* 2*d.*; for every quarter of barley, malt, or buck wheat, when the ſame did not exceed 32*s.*, equal to 1*l.* 8*s.* 5*d.*, the ſum of 16*s.*, equal to 19*s.* 2*d.*; for every quarter of oats, when the ſame did not exceed 16*s.*, equal to 19*s.* 2*d.*, the ſum of 5*s.* 4*d.*, equal to 6*s.* 5*d.*; and for every quarter of peaſe and beans, when the ſame did not exceed 40*s.*, equal to 2*l.* 8*s.*, the ſum of 16*s.*, equal to 19*s.* 2*d.* And that when the prices of corn ſhould exceed the aforeſaid rates, there ſhould be paid the former cuſtom and poundage: imagined to have been intended to be, by the act of 1663, 5*s.* 4*d.*, equal to 6*s.* 5*d.*, for wheat; 4*s.*, equal to 4*s.* 10*d.*, for rye, peaſe, and beans; 2*s.* 8*d.*, equal to 3*s.* 2*d.*, for barley and malt; and 1*s.* 4*d.*, equal to 1*s.* 6*d.*, for oats. 22 Charles II. c. 13. § 1, 2.

The above mentioned writer ſuppoſes that this law was without doubt deſigned to promote the exportation of Engliſh corn, and to reſtrain, if not prohibit, the importation of grain from abroad; but that the former was completely prevented, from the high duties continued upon it; and that the latter was rendered nugatory, in conſequence of no rule being laid down for aſcertaining the price of grain, at the time or place of importation: of courſe the trade continued to be carried on, on the payment of the low duties; agriculture languiſhed; the dealers finding their account in feeding the populace with foreign grain, the prices of courſe keeping high: the average price of the quarter of wheat, for the ten years preceding this period, having been 2*l.* 8*s.* 10*d.*, equal to 2*l.* 18*s.* 8*d.* of preſent money. It is ſuggeſted that by theſe laws the poorer ſort of farmers became ruined, and the richer were weakened, being neceſſitated to turn their attention from corn to live ſtock, or any other objects by which they could ſupport their families: the price of corn conſequently roſe on the manufacturer and labourer; and the importer of foreign grain became an important man, upon the ruins of the landholders, farmers, and others.

Notwithſtanding this, the reſt of this thoughtleſs and inattentive reign paſſed away without any alteration being made, though it continued for a period of fifteen years afterwards. Grain, of courſe, kept high in price: the average of the quarter of wheat, for the twenty years, from 1660 to 1680, having been 2*l.* 9*s.* 9*d.*, equal to 2*l.* 19*s.* 9*d.* of the preſent money.

In 1685, on the acceſſion of James II., the evaſion of the duties payable on imported corn, and the diſtreſs cauſed by the vaſt importation of grain from abroad, were brought under the conſideration of the legiſlature; and another act for the improvement of tillage paſſed, 1 Ja. II. c. 19, by which the defect of the above law was endeavoured to be obviated; it being there referred to the juſtices of the peace, in the ſeveral counties of England, where foreign grain might be imported, at their quarter ſeſſions, after Michaelmas and Eaſter, on the oaths of two or more ſubſtantial perſons, neither being merchants nor factors for the importation of corn, nor anywiſe concerned or intereſted in the corn to be imported, and each having a free eſtate of 20*l. per annum*, or a leaſehold of 50*l. per annum*, to determine the prices of the ſeveral kinds of grain, which they were to certify to the principal officer of the cuſtoms in the ſeveral counties, for his rule and regulation.

The importation of victual from Ireland had been prohibited in Scotland, under very ſevere penalties, Char. II. par. 2. ſeſſ. 3. c. 3, only reſerving to the lords of the privy council power to admit of it, for ſuch times as they ſhould think proper, when the price within the kingdom ſhould be at or above 8*l.* Scots, equal to 16*s.* of preſent money, for bear and meal; and 10*l.*, equal to 20*s.*, for wheat *per* boll. But in this year, 1686, by the act of Ja. VII. par. 1. ſeſſ. 3. c. 14, a total prohibition was enforced; all victual which ſhould then be imported, being directed to be ſunk or deſtroyed.

It is remarked by the writer we have quoted above, that for the ten years from 1650 to 1660, the average price of the quarter of wheat in this country had been 2*l.* 9*s.* 6*d.*, equal to 2*l.* 19*s.* 5*d.* of preſent money; that from the latter period to 1670, it had been 2*l.* 8*s.* 10*d.*, equal to 2*l.* 18*s.* 8*d.*; from this laſt period to 1680, it had been 2*l.* 10*s.* 8*d.*, equal to 3*l.* 0*s.* 10*d.*; and that from 1681 to 1685 incluſive, it had been 2*l.* 4*s.* 3*d.*, equal to 2*l.* 13*s.* 1*d.*

But the unfavourable tendency of the above ſyſtem of corn laws is more fully ſhewn by the ſcale of prices, fixed by them for the exportation and importation of wheat, in the following tables, from 1360 to 1688, as taken from the above excellent work.

TABLE of Exportation Prices and Duties for Wheat.

ENGLAND.

	Exportation Prices *per* Quarter.				Exportation Duties *per* Quarter.		
	Preſent Money.	Money of the Time.	Anno Domini	Anno Regis.	Money of the Time.	Preſent Money.	
	£. s. d.	*£. s. d.*			*£. s. d.*	*£. s. d*	
Permitted	0 0 0	0 0 0	1360	34 Edward III.	0 0 0	0 0 0	
	0 0 0	0 0 0	1393	17 Richard II.	0 0 0	0 0 0	
	0 0 0	0 0 0	1425	4 Henry VI.	0 0 0	0 0 0	
	2 4 0	0 6 8	1436	15 Henry VI.	0 0 0	0 0 0	
	0 16 6	0 6 8	1554	12 Phil.&Mary	0 0 0	0 0 0	
	1 0 8	0 10 0	1562	5 Elizabeth.	0 0 0	0 0 0	
	0 0 0	0 0 0	1570	13 Elizabeth.	0 1 0	0 2 1	by ſtatute.
	0 0 0	0 0 0			0 2 0	0 4 2	by licence.
	2 1 4	1 0 0	1593	35 Elizabeth.	0 2 0	0 4 2	
	2 13 4	1 6 8	1604	2 James I.	0 2 0	0 4 0	
	3 4 0	1 12 0	1623	21 James I.	0 2 0	0 4 0	
	2 11 2	1 12 0	1627	3 Charles I.	0 2 0	0 3 2	
	2 8 0	2 0 0	1660	12 Charles II.	1 0 0	1 4 0	
	2 17 7	2 8 0	1663	15 Charles II.	1 0 0	1 4 0	
Without limitation of prices	0 0 0	0 0 0	1670	22 Charles II.	1 0 0	1 4 0	

SCOTLAND.

	Prices *per* Boll.				Duties *per* Boll.	
	Preſent Money.	Money of the Time.	Anno Domini	Anno Regis.	Money of the Time.	Preſent Money.
	£. s. d.	*£. s. d.*			*£. s. d.*	*£. s. d.*
Prohibited	0 0 0	0 0 0	1587	20 James VI.	0 0 0	0 0 0
Permitted when under	1 4 0	12 0 0	1663	15 Charles II.	0 5 0	0 0 6
	1 4 0	12 0 0	1669	21 Charles II.	0 0 10	0 0 1

TABLE of Importation Prices and Duties for Wheat.

ENGLAND.

	Importation Prices *per* Quarter.								Importation Duties *per* Quarter.					
	Preſent Money.			Money of the Time.			Anno Dom.	Anno Regis.	Money of the Time.			Preſent Money.		
	£.	*s.*	*d.*	£.	*s.*	*d.*			£.	*s.*	*d.*	£.	*s.*	*d.*
Invited - - -	0	0	0	0	0	0	1202	3 John.	0	0	0	0	0	0
Invited - - -	0	0	0	0	0	0	1215	16 John.	0	0	0	0	0	0
Invited - - -	0	0	0	0	0	0	1266	9 Henry III.	0	0	0	0	0	0
Invited - - -	0	0	0	0	0	0	1297	25 Edward I.	0	0	0	0	0	0
Invited - - -	0	0	0	0	0	0	1328	2 Edward III.	0	0	0	0	0	0
Invited - - -	0	0	0	0	0	0	1358	25 Edward III.	0	0	0	0	0	0
Permitted - -	1	15	2	0	6	8	1463	3 Edward IV.	0	0	0	0	0	0
When not above	2	12	10	2	4	0	1660	12 Charles II.	2	0	0	2	8	0
When above that price	0	0	0	0	0	0			0	6	8	0	8	0
When not above - -	2	17	7	2	8	0	1663	15 Charles II.	0	5	4	0	6	5
When not above - -	3	4	0	2	13	4	1670	22 Charles II.	0	16	0	0	19	2
From that price to -	4	16	0	4	0	0			0	8	0	0	9	7
And when above that price -	0	0	0	0	0	0			0	5	4	0	8	0

SCOTLAND.

	Prices *per* Boll.								Duties *per* Boll.					
	Preſent Money.			Money of the Time.			Anno Dom.	Anno Regis.	Money of the Time.			Preſent Money.		
	£.	*s.*	*d.*	£.	*s.*	*d.*			£.	*s.*	*d.*	£.	*s.*	*d.*
Permitted - -	0	0	0	0	0	0	1663	15 Charles II.	3	0	0	0	6	0
Prohibited - -	0	0	0	0	0	0	1672	25 Charles II.	0	0	0	0	0	0
Prohibited - -	0	0	0	0	0	0	1686	2 James VII.	0	0	0	0	0	0

It is conſidered by Mr. Dirom as extraordinary, that the advantage which muſt neceſſarily accrue to a nation from raiſing the utmoſt poſſible quantity of corn, and exporting ſuch portions of it as the conſumption at home does not demand, ſhould, for ſuch a great length of time, have been miſunderſtood in this country; eſpecially ſince the example of the neighbouring ſtates, conſtantly bartering their excreſcent ſtock of this article for the raw materials and money of the kingdom, could ſcarcely have eſcaped notice for ſuch a number of centuries. The importation trade is conſidered as operating, in various ways, in direct oppoſition to the benefit of the country: in conſequence of which, agriculture became in a declining ſtate; much of the ground was without cultivation; there was a decreaſe in the population, a proportionate reduction in the public revenue neceſſarily took place; and the number of remaining manufacturers were of courſe fed at an exorbitant price, by the products of foreign lands, the inhabitants of which were not unfrequently at enmity with us, but who drew vaſt ſums from the country, and thus robbed it of its riches.

But we now approach a period in which a different ſyſtem was acted upon, and in which a very material change took place in the laws reſpecting corn; but which was not accompliſhed by ſimply reviſing or amending the old acts, or by merely reducing the duties upon exported grain, but by at once giving up every idea of revenue from grain raiſed at home; and thus holding out a new ſyſtem which ſhould invigorate and encourage the cultivation of the ſoil, while it afforded a new ſtimulus to the trade and navigation of the country.

In 1688, not long after the acceſſion of William and Mary to the crown, the ſubſequent important act for encouraging the exportation of corn was paſſed, 1 Will. & Mary, c. 12. and ibid. c. 24. § 18, by which exportation was permitted from England, when the prices at home did not exceed the following rates: malt or barley, 24*s.* the quarter, Wincheſter meaſure, equal to 28*s.* 10*d.* of preſent money; rye, 32*s.*, equal to 38*s.* 5*d.* *per* quarter; and wheat, 48*s.*, equal to 2*l.* 17*s.* 7*d.* the quarter; provided it was made in Engliſh ſhipping, the maſter and two-thirds of the mariners, at leaſt, being ſubjects of that ſtate, and the exporter producing a certificate under his hand, of the quantity of grain ſhipped, to the collector of the cuſtoms at the port where the grain had been ſhipped, and proving the ſaid certificate by the oaths of one or more credible perſons; and upon bond, of at leaſt 200*l.* for every 100 tons of corn, that the ſaid grain ſhould be exported to parts beyond the ſeas, and not again re-landed, the exporter ſhould receive the following bounties: for every quarter of barley or malt, ground or unground, 2*s.* 6*d.*, equal to 3*s.* of preſent money; for every quarter of rye, ground or unground, 3*s.* 6*d.*, equal to 4*s.* 2*d.*; for every quarter of wheat, ground or unground, 5*s.*, equal to 6*s.*: and on producing a certificate, under the common ſeal of the chief magiſtrate in any places beyond the ſeas, or under the hands and ſeals of two known Engliſh merchants, that ſuch corn had been actually landed; or upon proof, by credible perſons, that ſuch corn had been taken by enemies, or periſhed on the ſeas, the exporter's bond was to be given up; and the money, paid by the collector or commiſſioner of the cuſtoms, to paſs in his account.

And the ſame ſyſtem of policy was adopted ſoon afterwards in Scotland in 1695, by an act Will. par. 1. c. 32, in which all export duties were taken off, and a bounty of eight merks granted upon ilk chalder of corn exported, when the prices did not exceed the following: wheat twelve pounds the boll equal to 1*l.* 4*s*; bear, barley, or malt, eight pounds, equal to 16*s.* the boll; peaſe, oats, and meal, ſix pounds, equal to 12*s.* the boll; the whole being of Linlithgow meaſure, provided that the exportation was made in Scotch ſhips and by Scotſmen, the maſter and three-fourths of the ſeamen being Scotſmen, power however being reſerved to the lords of the ſecret council, when the prices exceeded the fixed rates, to diſcharge and diſcontinue exportation.

The duties and ſubſidies payable upon exported corn from England, not having been given up by the former act, they were now, 1700, finally removed and taken away by another act, 11 and 12 Will. III. c. 20. § 4, whether upon ground or unground grain.

By this means what has been termed a new ſyſtem of corn laws, was finally eſtabliſhed in both this country and Scotland, and the act of Union taking place ſoon afterwards, 1706, their laws concerning grain were made alike. That when oats ſhall be ſold at 15*s.* ſterling, equal to 18*s.* of preſent money, the quarter or under, there ſhall be paid 2*s.* 6*d.* ſterling, equal to 3*s.* bounty, for every quarter of the oatmeal, ſo long as rewards are granted for exportation of other grains; and that the bear of Scotland have the ſame reward as barley.

It has been already ſeen that the prices and duties of corn imported, had been determined by the act of 1670, but that for want of a rule for aſcertaining the prices at the times and places of importation, the duties were evaded. The act of 1685 was to ſupply this defect; it enjoined and required the juſtices of peace of the ſeveral counties, at their reſpective quarter ſeſſions, to inquire into and determine the prices of grain at fixed periods, and to ſend certificates thereof to the ſeveral cuſtom houſes within their juriſdiction, to be there hung up in a public place for the rule and direction of the parties concerned. But in conſequence of neither the trouble of its execution being compenſated, nor the neglect of it puniſhed, it was in many places unattended to; and from no mode or rule having been ſubſtituted, in ſuch an event, the defect was laid hold of by the importer, and much foreign grain was imported without payment of the duties during 1728 and 1729. And difficulties had likewiſe been met with from the modes employed in aſcertaining the prices and quantities of grain exported.

There being, therefore, in different places a great neglect in the juſtices of peace, to determine the prices of grain, by which the duties on imported corn were to be regulated, the matter was now, 1729, taken up, and they were directed to do it in future, in their reſpective counties, at their next quarter ſeſſions, or any adjournment, according to the act of 1670, and that on their omitting or neglecting to do it, and to certify the ſame, the collectors of the cuſtoms at the reſpective places of importation, were empowered to demand and receive the duties according to the loweſt price of the ſeveral ſorts of corn mentioned in the laſt named act.

And to aſcertain the quantity of grain ſhipped, for which a bounty was to be paid, in a better manner, the proper officers of the cuſtoms were directed to admeaſure the ſame, by a tub, or meaſure, containing four Wincheſter buſhels; and when ſuch corn to be exported was brought to be ſhipped off in ſacks, they were empowered to make choice of any two of them out of twenty, and in that way compute the quantity to be ſhipped, on which the bounty was to be paid: And that the ſame powers ſhould be employed in aſcertaining the prices and quantity of bear, bigg, oatmeal, and malt, made from wheat or wheat malt, for being exported, 2 Geo. II. c. 18. § 1, 2, 3, 4, 5. That in all ſuch caſes, as where any corn or grain had been imported ſince the firſt day of the Michaelmas quarter ſeſſion, then laſt paſt, where the importers or proprietors had omitted to pay the reſpective duties on the ſame on demand, they ſhould forfeit and loſe all ſuch grain, or the value of it.

Notwithſtanding this, neglects ſtill frequently occurred in determining the prices of grain, according to which the duties payable on importation were to be levied, and of courſe the means were afforded of much foreign grain being brought in, though the prices at home were very low; conſequently another act was now, 1732, paſſed, for the *better aſcertaining the ſame, and preventing fraudulent importation*, in which it was again recommended to the juſtices of peace, at their quarter ſeſſions, in the ſeveral counties where foreign grain ſhould or might be imported, to give in charge, to the grand jury, in the open court, to make inquiry and preſentment, upon their oaths, of the common corn market prices, of middling Engliſh corn and grain, of the reſpective ſorts and quantities mentioned in the act, made in the 22d year of the reign of king Charles II. as the ſame ſhould be commonly bought and ſold, in every ſuch county, which preſentment ſhould be certified by the ſaid parties, in writing, to his majeſty's chief officer and collector of the cuſtoms for the time being, at every ſuch port, place, or haven, where importation ſhould be made, and which ſhould be hung up in ſome public place in the cuſtom houſe, for general information and inſtruction: and that the cuſtom duty upon foreign grain imported, as directed by the above act of Charles II., ſhould be collected and paid, according to the prices contained in ſuch certificate. But that after importation, no foreign corn or grain was to be exported, or in any manner or ſhape laden on ſhip board, or put to ſea, for carrying, conveying, or tranſporting it from one part or port of the kingdom to another, either by itſelf or in mixture with Engliſh corn, under the very ſevere penalties and forfeitures therein mentioned. 5 Geo. II. c. 12.

It is ſtated by Mr. Dirom, in his very able "Inquiry into the Corn Laws and Corn Trade," that at this period agriculture had conſiderably recovered its ſtrength, and that the exertions of the farmers had become vigorous and conſtant. That the prices of corn for ſeveral years preceding it had been very reaſonable, and that a great export trade in corn had been carried on from this country; proper attention having been paid to the execution of thoſe laws which were made to guard againſt fraudulent importations: the average price of the quarter of wheat, for the five years from 1731 to 1735 incluſive, being only 34*s.*; in 1736, 40*s.*; in 1737, 38*s.*; and in this year 1738, only 35*s.* 6*d.* yet under theſe plentiful circumſtances, the lower orders of the populace were excited to commit various outrages, by which the corn was deſtroyed. Therefore, in order to repreſs ſuch diſorders, an act was paſſed, 11 Geo. c. 22, by which ſuch offenders were ſeverely puniſhed, and the inhabitants of the hundreds, in which ſuch outrages ſhould be committed, ſubjected to the payment of the damages.

The power of ſuſpending the laws, in Scotland, which were made to prohibit the importation of foreign grain, or to buy, ſell, or retail the ſame, which had reſted on the act of 1703, and the two preceding ones therein referred to, having been formerly veſted in the privy council of that kingdom; in conſequence of the prices of grain having riſen in 1740, from the ſeverity of the winter, and ſome importation of foreign grain made contrary to law, from there exiſting no power of ſuſpending the prohibitory acts there, on account of the act of the ſixth Anne, c. 6. having done away the privy council, a temporary expedient without any new plan was now, 1741, had recourſe to, and a law made, which transferred ſuch power to the courts of ſeſſion, juſticiary, and exchequer; the judges in theſe courts being required to determine on the neceſſity of exportation or importation, from the prices of grain in the county of Edinburgh. The duties payable in England by the act of the 22 Charles II. being required by the ſame law to be paid on the importation of grain into Scotland; the whole of the clauſes and proviſions of that act, as well as of that of the 2 George II., termed "An act to aſcertain the cuſtom payable on Corn imported, being extended to Scotland."

Difficulties having ariſen concerning the computation and meaſurement of wheat, meal, and other ground corn, on which a bounty was payable upon exportation, in order to adjuſt all differences ariſing thereon, by a law now (1751) made, the officers of the cuſtoms were empowered to allow the ſame bounty on the exportation of 224 pounds weight of wheat meal, or other ground corn or grain, as was allowed upon the exportation of four buſhels of wheat, or other corn or grain, unground; and for the more effectually expediting the buſineſs, they were permitted to make choice of any two ſacks out of twenty, from which to compute the weight. 24 Geo. II. c. 56. § 1.

Theſe laws had greatly contributed to the extenſion of the export trade in grain, while plenty continued at home, with moderate prices. It is ſtated, that the average exportation of four years, from 1748 to 1751 incluſive, was 1,212,686 quarters annually; and that the average price of wheat, for the ſame four years, was 36*s.* 3*d.* the quarter.

From the money, applicable to the payment of the bounty, becoming inadequate to the diſcharge of the ſums due on ſuch extenſive exportations, an act was now (1753) paſſed, 26 Geo. II. c. 15, by which the debentures, for the bounties on exported corn, were to carry an intereſt, when not paid within ſix months, at the rate of 3 *per cent. per annum*, according to the regulations of the act of the 12 and 13 of king William.

The crop of 1756 being defective and the prices of courſe riſing, the populace from being long in the habits of plenty, miſtaking the cauſe, committed various outrages in different places. And a law was brought forward in 1757. 30 Geo. II. c. 1, by which all ſorts of corn, meal, malt, flour, bread, biſcuit, or ſtarch, were prohibited exportation, before the 25th December 1757, except malt made to be exported, and declared to be ſo before the 4th December 1756, ſhips cleared out with it before the 25th being ſuffered to proceed on their voyages: power was however reſerved to the king to remove the prohibition by proclamation, and to admit all perſons, natives as well as foreigners, but no particular perſon or perſons, to export grain. All duties, cuſtoms, rates, and impoſitions of every kind, on corn or flour, imported, or taken from the enemy and brought into the kingdom, were diſcontinued until the 24th of Auguſt 1757; and the ſame might be carried coaſtways free of duty, 30 Geo. II. c. 7, and importation without duty was permitted alſo in ſhips of other friendly nations from any port or place whatever, 30 Geo. II. c. 9. § 14. After 11th March 1757, the diſtillation of low wines and ſpirits from any wheat, barley, malt, or any other ſort of grain, or from any meal or flour, was prohibited during the ſpace of two months, 30 Geo. II. c. 10. and it was afterwards continued to the 11th December in the ſame year; but with power to his majeſty to ſuſpend the act and permit it, by proclamation or an order of council. 30 Geo. II. c. 15.

By theſe laws and regulations, the exportation of corn is ſtated to have been completely checked, the quantity of about 80,000 quarters having been exported, previouſly to the prohibition, and about 150,000 quarters of foreign grain brought in.

There was however a reſtoration of the exportation trade in 1759 it proceeding as uſual, with but little importation of foreign corn, but in conſequence of the crop of 1762, being a little deficient, importation took place from the riſe of prices, which at the low duties was capable of being done, and of courſe was conſiderable, during that and the three years which followed it. During the laſt, from ſome cauſe of fear, an embargo was laid upon all ſhips loaden with corn for exportation, the 26th of September, but which having been done contrary to law, it was neceſſary to paſs an act of indemnity for it in the following year 1766, the 7 Geo. III. c. 7. On this it is remarked by the writer quoted above that there does not now ſeem to have been any ſufficient ground for thoſe meaſures; as in the year ſtated there were more than 300,000 quarters of grain exported, and under 250,000 imported.

In 1767, prohibitory laws were paſſed for a limited period, for the prevention of the exportation of corn, grain, meal, flour, bread, biſcuit, and ſtarch, as well as the extraction of low wines, and ſpirits from wheat and wheat flour. Alſo a law for permitting, for a limited time, the importation of wheat and wheat flour, oats, and oatmeal, rye, and ryemeal without duty. 7 Geo. III. c. 3, 4, 5, 8. And in 1768 the ſame laws were renewed, having ſome additions made to them; it being now enacted that they ſhould continue in force until twenty days after the beginning of the next ſeſſions of parliament, or the exportation of the above different articles, as well as their diſtillation and preparation from wheat or wheat flour, was prohibited, except to particular Britiſh dependencies. And the importation both of wheat, wheat flour, barley, barleymeal, pulſe, oats, oatmeal, rye, ryemeal, from any part of Europe, and maize or Indian corn and rice from North America, as well as wheat and wheat flour from Africa, were allowed without any duty. 8 Geo. III. c. 1, 2, 3. And in 1769, the prohibition was continued until twenty days after the meeting of the next ſeſſions of parliament, but the importation of rice from North America permitted duty free.

But in 1770 the former law of the preceding year, prohibiting the exportation of corn, grain, meal, malt, flour, bread, biſcuit, and ſtarch, and alſo the extraction of low wines and ſpirits from wheat or wheat flour, was continued in force until twenty days after the commencement of the enſuing ſeſſion of parliament, provided that the ſaid continuation might be abridged, and this act, or any part of it, altered and varied by any other act or acts to be enacted in the preſent ſeſſion. 10 Geo. III. c. 1. Conſequently by another law of this ſeſſion, thoſe parts of the former acts, which prohibited the exportation of malt, were repealed. 10 Geo. III. c. 10. And an act was likewiſe paſſed for regiſtering the prices at which corn was ſold in the ſeveral counties of Great Britain, as well as the quantity exported and imported. 10 Geo. III. c. 39. And in 1771 prohibitory laws againſt the exportation and extraction of the above different articles were again paſſed, 11 Geo. III. c. 1. (with the exception of victualling ſhips, on their being ſent to Britiſh dependencies) to be in force till the twentieth day after the meeting of the next ſeſſion of parliament. On the meeting of the ſeſſion of parliament in the following year (1772), a prohibitory law was again paſſed, againſt the exportation and extraction of the ſame articles, to be in force till the twentieth day after the meeting of the next ſeſſion of parliament. Afterwards an act was likewiſe paſſed, permitting the importation of wheat, wheat flour, rye, ryemeal, and Indian corn, without duty, until the firſt day of December in the ſame year.

It is conſidered by the able inquirer into the corn laws and corn trade mentioned above, that all this would ſeem to have been had recourſe to without any ſufficient grounds, as the price of grain was not by any means very high, and the quantity exported from the year 1760 to 1770 greatly exceeded that which was imported.

On the meeting of parliament in 1773, an act was, however, paſſed, by which a free importation was permitted before the firſt day of January in the following year, for any wheat, wheat flour, rye, ryemeal, barley, barleymeal, oats, oatmeal, peaſe, beans, tares, calivancies, and all other ſorts of pulſe, from any part of Europe or Africa; and permiſſion to carry the ſame coaſtways, under ſimilar regulations to thoſe of wheat or wheat flour the growth of this country, provided due entries were made according to the previous practice of the kingdom; and likewiſe for the free importation of wheat, wheat flour, Indian corn and meal, biſcuit, peaſe, beans, tares, calivancies and all other ſorts of pulſe, from North America, under the ſame regulations. And another prohibitory law was enacted, 13 Geo. III. c. 1, 2, 3, preventing the exportation and extraction of all the above named articles, wines and ſpirits, except for victualling ſhips, or to Britiſh dependencies, until the firſt day of January 1774.

Theſe laws, though radically injurious to the agriculture of the country, are conceived by Mr. Dirom, from their not trenching on the general ſyſtem, as only productive of a temporary effect which might have been overcome.

By another law of the ſame year 1773, the 13 Geo. III. c. 40. ſuch alterations and changes were however made, by the reduction of the export and import prices, and the rendering the duties on importation a mere trifle, that a *new ſyſtem* ſeems to have been introduced and eſtabliſhed in the corn laws, deſtructive of the *old code* by which ſuch benefits had accrued to the agriculture and commercial induſtry of the country; and by which, beſides producing plenty and reaſonable prices at home, by the diſpoſal of the excreſcent ſtock in foreign markets, vaſt ſums of money had been brought into the kingdom. The manner in which that uſeful code had been gradually raiſed, formed, and matured by experience, through a vaſt length of time, and finally eſtabliſhed by the laws of 1670, 1688, and 1706, has been amply ſhewn in the preceding part. But in order to place the *different ſyſtems* in a better point of contraſt, and thereby afford a more diſtinct notion of their nature and principles, the excellent comparative tables introduced below, have been drawn from Mr. Dirom's "Inquiry into the Corn Laws, &c."

TABLE.—Old Syſtem of Laws for Importation of Grain.

	Importation Prices and Duties.	Money of the Time.						Preſent Money.					
		Prices.			Duties.			Prices.			Duties.		
		£.	s.	d.	£.	s.	d.	£.	s.	d.	£.	s.	d.
	For every quarter of wheat, when the prices did not exceed	2	13	4	0	16	0	3	4	0	0	19	2
	when above that price, and not exceeding	4	0	0	0	8	0	4	16	0	0	9	7
	when above that price	0	0	0	0	5	4	0	0	0	0	6	5
1670	For every quarter of rye, peas, and beans, when the price did not exceed	2	0	0	0	16	0	2	8	0	0	19	2
	when above that price	0	0	0	0	4	0	0	0	0	0	4	10
	For every quarter of barley, when the price did not exceed	1	12	0	0	16	0	1	18	5	0	19	2
	when above that price	0	0	0	0	2	8	0	0	0	0	3	2
	For every quarter of oats, when the price did not exceed	0	16	0	0	5	4	0	19	2	0	6	5
	when above that price	0	0	0	0	1	4	0	0	0	0	1	6

TABLE.—New Syſtem of Laws for Importation of Grain.

	Importation Prices and Duties.	Prices.			Duties.		
		£.	s.	d.	£.	s.	d.
1773	For every quarter of wheat, when the price was at or above	2	8	0	0	0	6
	100 weight of wheat flour	0	0	0	0	0	2
	quarter of rye, peas, or beans, when the price was at or above	1	12	0	0	0	3
	barley, bear, or bigg, when the price was at or above	1	4	0	0	0	2
	oats, when the price was at or above	0	16	0	0	0	2

It is remarked by the able writer, in reſpect to theſe tables, that, according to the *old laws*, but eſpecially that of 1670, importation was not allowed till the prices at home were very high, and then even the duties were great, in conſequence of which, foreign corn could be only introduced for the ſupply of times of ſcarcity, never being able to come in competition with the home produce. That, the law of 1688 did not even notice importation; it being ſolely enacted for the purpoſe of promoting and encouraging the agriculture of the country, by affording a new market for the ſuperabundant grain, and in that way giving a new ſtimulus to the exertion of the people, to bring the waſte and barren lands into a ſtate of profitable cultivation: The buſineſs of importation being left to the laws which previouſly exiſted, by which it was ſuppoſed to be ſufficiently reſtricted, if not wholly prohibited.

It is obſerved further, that at the time thoſe laws were paſſed, and till 1714, the intereſt, borne by money, was 6 *per centum per annum*, being of courſe proportionally of greater value than at preſent, when the intereſt is only 5 *per cent. per annum*. Beſides, the old acts did not, in fact, admit the importation of flour or ground corn at any period; only the grain at certain places, where the prices ſhould happen to be very high. Neither did they allow the carrying of imported grain by ſea, coaſtways, nor the tranſporting of it to any other place, except that to which neceſſity had brought it; reſtrictions which ſeemed ſo eſſential as to require being enforced, under very ſevere penalties, by the act of the 5th of George II.

But that the *new law*, or that of 1773, commences with importation, and directs that, at any time when the price of the middling ſort of Britiſh grain ſhall be at the prices ſtated in the above tables, at the ſeveral ports and places where the ſame ſhould be imported; then all cuſtoms and duties, formerly payable on wheat, wheat flour, rye, peaſe, beans, barley, bear, bigg, and oats, imported into the kingdom, ſhould ceaſe and be no longer payable, while theſe prices continued. That, inſtead of the former duties, thoſe ſtated in the above table, ſhould only be paid. It was likewiſe enacted, that the importation of oatmeal from Ireland, or any other part beyond the ſeas, into any port or place in Scotland, ſhou'd be lawful, where the price of oatmeal exceeds 16*s.* the boll of 8 ſtone, troy weight.

Further, that by the new law importation is admitted, when the prices of grain at home are at ſuch a reduced rate, as that foreign corn may always come in competition with the home produce in the markets, an evil that has conſtantly exiſted ſince the paſſing of the act; beſides, by this law, wheat and other grain imported, may be conveyed coaſtways, and entered and landed in any other parts of the kingdom, at which the prices of middling Britiſh corn, grain, or flour, are at or above the reſpective rates ſtated in the table given above, under ſuch regulations as wheat, wheat flour, rye, peaſe, beans, barley, bear, bigg, or oats, the growth of this kingdom, are permitted to be conveyed coaſtwiſe. Alſo, that on importing corn, grain, or flour, and paying the duties, where the ſame ſhall be again exported within ſix months, the duties were to be drawn back and repaid.

TABLE.—Old Laws for the Exportation of Grain.

	Exportation Prices and Bounties.	Money of the Time.						Preſent Money.					
		Prices.			Bounties			Prices.			Bounties.		
		£.	s.	d.	£.	s.	d.	£.	s.	d.	£.	s.	d.
1688	Upon every quarter of wheat, ground or unground, when the prices were at or under	2	8	0	0	5	0	2	17	7	0	6	0
	of rye, when the price was at or under	1	12	0	0	3	6	1	18	5	0	4	2
	of barley or malt, when the price was at or under	1	4	0	0	2	6	1	8	10	0	3	0
1706	of oatmeal, when the quarter of oats is at or under	0	15	0	0	2	6	0	18	0	0	3	0

TABLE.—New Laws for the Exportation of Grain.

	Exportation Prices and Bounties.	Prices.			Bounties.		
		£.	s.	d.	£.	s.	d.
1773	Upon every quarter of wheat, or malt of wheat, when the price is under -	2	4	0	0	5	0
	of rye, when the price is under - - - -	1	8	0	0	3	0
	of barley, bigg, or malt made thereof, when the price is under -		2	0	0	2	6
	of oats, when the price is under - - -	0	14	0	0	2	0
	And for every quarter of oatmeal, conſiſting of 276 *lbs.* avoirdupois - -	0	0	0	0	2	6

The proviſions of the *old laws* of 1688 and 1706, have been already ſo fully ſtated and conſidered, that nothing further than what is contained in the above table ſeems requiſite here.

Under the *new law* it was enacted, that, when the price of the quarter of wheat was at, or above, 44*s.*; rye, peaſe, and beans, 28*s.*; barley, bear, and bigg, 22*s.*; and oats, 14*s.* no ſuch corn or grain ſhould be tranſported or conveyed out of the kingdom, under ſevere penalties. That after the 1ſt day of January 1774, the bounties formerly allowed by law upon grain exported, ſhould ceaſe and determine; and that, in the place thereof, when the prices of it ſhould be under the rates ſtated below, at the ports and places, whence the ſame ſhould be ſhipped, there ſhould be allowed, on the exportation of ſuch grain, either ground or unground, being the growth of this kingdom, and ſhipped in Britiſh ſhips, the maſter, and at leaſt two-thirds of the mariners of ſuch ſhips being ſubjects of his majeſty, theſe bounties; that is to ſay, when the price of middling Britiſh wheat is *per* quarter under 44*s.* a bounty for every quarter of wheat, or malt made from it, 5*s.*; when the quarter of rye was under 28*s.* a bounty of 3*s.*; when the quarter of barley, bear, or bigg, was under 22*s.* a bounty of 2*s.* 6*d.* for every quarter of them, or of malt made from them, and when the quarter of oats was under 14*s.*, a bounty of 2*s.* on every quarter, and 2*s.* 6*d.* upon every quarter of oatmeal, conſiſting of 276 pounds avoirdupois weight.

Further, that, by the old laws, the juſtices of peace were to aſcertain the prices at their quarter ſeſſions, which, by the new law, was continued the ſame for England; but for Scotland it was transferred to the ſheriffs of the different counties to be aſcertained four times in every year, certificates of which were to be ſent to the cuſtom-houſes within their juriſdiction reſpectively, ſo as to regulate the payment of the export and import bounties and duties.

However, ſo far as exportation was concerned, thoſe rules were, in 1774, wholly altered, it being enacted, that the prices of exported corn, grain, and oatmeal ſhould be regulated and directed according to the average prices, at which they ſhould be reſpectively ſold in the public market at or neareſt to the port or place whence they ſhould be intended to be exported, on the market day preceding that of their being ſhipped, and the bounties to be payable accordingly.

From the comparative ſtatements given in the above tables, the difference in the principles and operations of theſe different ſyſtems of laws, will be eaſily underſtood, the former being calculated for the promotion of cultivation at home, and preventing the importation of foreign corn, unleſs called for by neceſſity; while the latter is formed for the purpoſe of promoting the importation of grain from abroad, whether there may be any neceſſity for it or not. Thus the foreign cultivator is allowed the liberty of importing his flour into the country almoſt free from duty, while the bounty upon flour or meal produced from wheat is taken off.

But in order to expedite and render the conception of the various laws, which have been detailed above, more eaſy and familiar, we ſhall here introduce the tabular view of them given by the author of the "Inquiry into the Corn Laws and Corn Trade," as brought down to the year 1773.

TABLE.

Anno Dom.	Anno Regis	Abbreviation of Engliſh Exportation Laws.
1360	34 Ewd. III.	Exportation prohibited.
1393	17 Rich. II.	Allowed, upon payment of the ordinary ſubſidies and duties.
1425	4 Hen. VI.	The laſt law confirmed, but reſerving power to the king and council to reſtrain it.
1436	15 Hen. VI.	Allowed, when wheat did not exceed 6*s.* 8*d.* and barley 3*s. per* quarter.
1442	20 Hen. VI.	The laſt act confirmed for 10 years.
1444	23 Hen. VI.	And that act now made perpetual.
1552	5 & 6 Ed. VI.	Prohibited, until the prices were at or under 6*s.* 8*d.* for wheat, 3*s.* 4*d.* for barley and malt, 2*s.* for oats, 4*s.* for peaſe and beans, and 5*s.* for rye *per* quarter.
1554	1 & 2 P. & M.	Prohibited, when the prices did not exceed 6*s.* 8*d.* for wheat, 4*s.* for rye, and 3*s.* for barley *per* qr.
1562	5 Eliz.	Allowed, when the prices did not exceed 10*s.* for wheat; 8*s.* for rye, peaſe, and beans; 6*s.* 8*d.* for barley and malt, *per* quarter.
1570	13 Eliz.	Allowed, under the direction of preſidents, &c. upon payment of duties.
1593	35 Eliz.	Allowed, when the prices did not exceed 20*s.* for wheat, 13*s.* 4*d.* for rye, peaſe, and beans, 12*s.* for barley and malt, upon payment of a duty of 2*s.* for every quarter of wheat, and 16*d.* for every quarter of other grain.
1604	2 James I.	Allowed, when the prices did not exceed 26*s.* 8*d.* for wheat, 15*s.* for rye, peaſe, and beans, and 14*s.* for barley and malt *per* quarter; and upon payment of the ſame duties

Anno Dom.	Anno Regis.	Abbreviation of Engliſh Exportation Laws.
1623	21 James I.	Allowed, when the prices did not exceed 32*s.* for wheat; 20*s.* for rye, peaſe, and beans, barley and malt *per* quarter, and upon payment of the ſame duties.
1627	3 Charles I.	Allowed upon the ſame terms with the laſt act.
1660	12 Charles II.	Allowed, when the prices did not exceed 40*s.* for wheat; 24*s.* for rye, peaſe, and beans; 20*s.* for barley and malt, and 16*s.* for oats, upon payment of the ſame high duties.
1663	15 Charles II.	Allowed, when the prices did not exceed 48*s.* for wheat, 32*s.* for rye, peaſe, and beans, 28*s.* for barley and malt, and 13*s.* 4*d.* for oats *per* quarter, upon payment of the ſame high duties.
1670	22 Charles II.	Allowed, without limitation of prices, upon payment of the ſame high duties.
1688	1 W. & M.	Not only allowed, when wheat was not above 48*s.* rye 32*s.* and barley and malt 24*s.* *per* quarter; but bounties granted.
1699	10 Will. III.	Prohibited for one year, from the 10th February 1699.
	11 Will. III.	Bounty ſuſpended from 9th Feb. 1699, to 29th September 1700.
1700	11 & 12 W. III.	The ſubſidy and all the duties payable upon corn and grain, ground and unground, bread, biſcuit, and meal given up and totally removed.

TABLE.

Anno Dom.	Anno Regis.	Abbreviation of Britiſh Exportation Laws.
1706	5 Anne.	Union ſettled-Engliſh bounties adopted over all the kingdom, and extended to oatmeal, bigg, and malt of wheat.
1709	8 Anne.	Exportation prohibited, until the 29th Sept. 1710.
1729	2 Geo. II.	Rules laid down for meaſuring corn to be exported, and for aſcertaining the prices, &c.
1732	5 Geo. II.	Grand juries at ſeſſions, to prevent the price of corn, and corn imported, not to be again exported, nor carried coaſtways.
1741	14 Geo. II.	Prohibited until the 25th Dec. 1741.
1751	24 Geo. II.	Bounties upon corn exported in meal, to be paid according to the weight, at the rate of 448 pounds for the quarter
1753	26 Geo. II.	Money due upon debentures for corn exported, to bear intereſt at 3 *per cent per annum*, if not paid in ſix months after preſenting the certificate.
1757	30 Geo. II.	Prohibited until the 25th Dec. 1757. but with power to the king and council to take off the prohibition
1757	31 Geo. II.	Corn-market eſtabliſhed at Weſtminſter; and, the ſame year, an aſſize made for bread.
1766	6 Geo. III.	Exportation prohibited for a limited time; and, ſame year, an embargo laid upon ſhips loaded with corn for exportation; and ſame year, the mayor and aldermen of London empowered to determine the prices of corn in January and July. as well as in April and October.
1767	7 Geo. III.	Exportation of grain, and diſtilling from wheat or wheat-flour, prohibited from the 26th Sept. to the 14th Nov. 1767.
1768	8 Geo. III.	Exportation of corn, and diſtilling from wheat or wheat-flour, prohibited until 20 days after the commencement of the next ſeſſions of parliament.
1769	9 Geo. III.	Five thouſand quarters of bigg allowed to be exported from the iſlands of Orkney, yearly; and, ſame year, exportation of grain and diſtilling from wheat or wheat-flour prohibited for a limited time.
1770	10 Geo. III.	Corn regiſter eſtabliſhed; and weekly returns, from market-towns in the ſeveral countries, to be made of the prices of wheat, rye, barley, oats, and beans, in England; and of bear or bigg in Scotland. Same year the exportation of corn, and the diſtilling from wheat or wheat-flour, prohibited till 20 days after the commencement of the next ſeſſion of parliament.
1771	11 Geo. III.	Exportation of corn prohibited, and alſo the diſtilling from wheat or wheat-flour, until 20 days after the commencement of the next ſeſſion of parliament.
1772	12 Geo. III.	Exportation of corn, and diſtilling from wheat and wheat-flour, prohibited until 20 days after the commencement of next ſeſſion of parliament.
1773	13 Geo. III.	Exportation of grain, and diſtilling from wheat and wheat-flour, prohibited until the 1ſt day of Jan. 1774. Same year, the former bounties and duties repealed, and a total alteration made in the corn laws.
1774	14 Geo. III.	Alteration of the method of aſcertaining the prices of corn to be ſhipped for exportation.

TABLE.

CORN.

TABLE.

Anno Domini.	Anno Regis.	Abbreviation of Engliſh Exportation Prices.	Money of the Time	Preſent Money.
1436	15 Hen. VI.	Exportation permitted, when the price of grain, at home, did not exceed *per* quarter, for	£. s. d.	£. s. d.
		Wheat	0 6 8	2 4 0
		Barley	0 3 0	0 19 10
1554	1 P. & M.	Permitted, when the price did not exceed, for		
		Wheat	0 6 8	0 16 6
		Rye	0 4 0	0 9 11
		Barley	0 3 0	0 7 5½
1562	5 Eliz.	Permitted, when the price did not exceed, for		
		Wheat	0 10 0	1 0 8
		Rye, peaſe, and beans	0 8 0	0 16 6
		Barley and malt	0 6 8	0 13 10
1593	35 Eliz.	Permitted, when the price did not exceed, for		
		Wheat	1 0 0	2 1 4
		Rye, peaſe, and beans	0 13 4	1 7 7
		Barley and malt	0 12 0	1 4 10
1604	2 James I.	Permitted, when the price did not exceed, for		
		Wheat	1 6 8	2 13 4
		Rye, peaſe, and beans	0 15 0	1 10 0
		Barley and malt	0 14 0	1 8 0
1623	21 James I.	Permitted, when the price did not exceed, for		
		Wheat	1 12 0	3 4 0
		Rye	1 0 0	2 0 0
		Barley, malt, peaſe, and beans	0 16 0	1 12 0
1627	3 Char. I.	Permitted, when the price did not exceed, for		
		Wheat	1 12 0	2 11 2
		Rye	1 0 0	1 12 0
		Barley, malt, peaſe, and beans	0 16 0	1 5 7
1660	21 Char. II.	Permitted, when the price did not exceed, for		
		Wheat	2 0 0	2 8 0
		Rye, peaſe, and beans	1 4 0	1 8 9
		Barley and malt	1 0 0	1 4 6
		Oats	0 16 4	0 19 2
1663	15 Char. II.	Permitted, when the price did not exceed, for		
		Wheat	2 8 0	2 17 7
		Rye, peaſe, and beans	1 12 0	1 18 4
		Barley and malt	1 8 0	1 13 7
		Oats	0 13 4	0 16 0
1688	1 W. & M.	Permitted, when the price did not exceed, for		
		Wheat	2 8 0	2 17 7
		Rye	1 12 0	1 18 4
		Barley and malt *	1 4 0	1 8 9

* Prior to the year 1346, the exportation of all kinds of grain from England was totally prohibited.

TABLE.

Anno Domini.	Anno Regis.	Abbreviation of Britiſh Exportation Prices.	Money of the Time.	Preſent Money.
1706	5 Anne.	Exportation of grain permitted, when the price of the quarter did not exceed, for	£. s. d.	£. s. d.
		Wheat, ground or unground, or malt of wheat	2 8 0	2 17 7
		Rye, ground or unground	1 12 0	1 18 5
		Barley, bear, or bigg, or malt, ground or unground	1 4 0	1 8 9
		Oats	0 15 0	0 18 0
1773	13 Geo. III.	Exportation permitted, when the prices were under, for		
		Wheat	0 0 0	2 4 0
		Rye	0 0 0	1 8 0
		Barley, bear, or bigg, or malt thereof	0 0 0	1 2 0
		Oats	0 0 0	0 14 0

CORN.

TABLE.

Anno Dom.	Anno Regis.	Abbreviation of Engliſh Exportation Duties.	Price of the Quarter of Grain.						Duties *per* Quarter.					
			Money of the Time.			Preſent Money.			Money of the Time.			Preſent Money.		
			£.	s.	d.	£.	s.	d.	£.	s.	d.	£.	s.	d.
1570	13 Elizabeth.	For wheat, when not prohibited - -	0	0	0	0	0	0	0	1	0	0	2	0
		other grain - - - -	0	0	0	0	0	0	0	0	8	0	1	4
		wheat exported by licence - -	0	0	0	0	0	0	0	2	0	0	4	0
		other grain by ditto - - -	0	0	0	0	0	0	0	1	4	0	2	8
1593	35 Elizabeth.	For wheat, when the price did not exceed -	1	0	0	2	1	5	0	2	0	0	4	0
		other grain as *per* exportation prices -	0	0	0	0	0	0	0	1	4	0	2	8
1604	2 James I.	For wheat, when the price did not exceed -	1	6	8	2	13	4	0	2	0	0	4	0
		other grain as *per* exportation prices -	0	0	0	0	0	0	0	1	4	0	2	8
1623	21 James I.	For wheat, when the price did not exceed -	1	12	0	3	4	0	0	2	0	0	4	0
		other grain as *per* exportation prices -	0	0	0	0	0	0	0	1	4	0	2	8
1627	3 Charles I.	For wheat, when the price did not exceed -	1	12	0	2	11	2	0	2	0	0	3	2½
		other grain *per* exportation prices -	0	0	0	0	0	0	0	1	4	0	2	1½
1660	12 Charles II.	For wheat, when the price did not exceed -	2	0	0	2	8	0	1	0	0	1	4	0
		Rye, peas, beans, barley, malt, buck wheat -	0	0	0	0	0	0	0	10	0	0	12	0
		Oats when not above - - -	0	16	0	0	19	2	0	6	8	0	8	0
1663	15 Charles II.	For wheat when the price did not exceed -	2	8	0	2	17	7	1	0	0	1	4	0
		Rye, peas, beans, barley, malt, buck wheat -	0	0	0	0	0	0	0	10	0	0	12	0
		Oats - - - - - -	0	13	4	0	16	0	0	0	0	0	0	0
1670	22 Charles II.	For wheat, without limitation of price -	0	0	0	0	0	0	1	0	0	1	4	0
		Rye, peas, beans, barley, malt, buck wheat -	0	0	0	0	0	0	0	10	0	0	12	0
		Oats - - - - - -	0	0	0	0	0	0	0	6	8	0	8	0

TABLE.

Anno Dom.	Anno Regis.	Engliſh and Britiſh Bounties on Exportation.	Price of the Quarter of Grain.						Bounties *per* Quarter.					
			Money of the Time.			Preſent Money.			Money of the Time.			Preſent Money.		
			£.	s.	d.	£.	s.	d.	£.	s.	d	£.	s.	d.
1688	1 Will. & Mary.	For wheat, when the price did not exceed -	2	8	0	2	17	7	0	5	0	0	6	0
		Rye, ground or unground, when not above -	1	12	0	1	18	5	0	3	6	0	4	2½
		Barley and malt, ground or unground, when not above - - - - -	1	4	0	1	8	9	0	2	6	0	3	0
1706	5 Anne.	For wheat or malt made of wheat, ground or unground, when not above - -	2	8	0	2	17	7	0	5	0	0	6	0
		Rye, ground or unground, when not above -	1	12	0	1	18	5	0	3	6	0	4	2½
		Barley, bear, or bigg, malt, ground or unground, when not above - -	1	4	0	1	8	9	0	2	6	0	3	0
		Quarter of oatmeal when oats not above -	0	15	0	0	18	0	0	2	6	0	3	0
1773	13 George III.	For wheat and malt of wheat, when the price is under - - - - -	0	0	0	2	4	0	0	0	0	0	5	0
		Rye, when under - - - -	0	0	0	1	8	0	0	0	0	0	3	0
		Barley, bear, or bigg, when under - -	0	0	0	1	2	0	0	0	0	0	2	6
		Oats, when under - - - -	0	0	0	0	14	0	0	0	0	0	2	0
		And for every quarter of oatmeal conſiſting of 276 pounds avoirdupois. - -	0	0	0	0	0	0	0	0	0	0	2	6

TABLE.

C O R N.

TABLE.

Anno Domini.	Anno Regis.	Abbreviation of Engliſh Importation Prices.	Money of the Time.			Preſent Money.		
			£.	s.	d.	£.	s.	d.
1463	3 Edw. IV.	Importation of foreign grain permitted, when the prices at home *per* quarter did exceed, for						
		Wheat	0	6	8	1	15	2
		Rye	0	4	0	1	1	1
		Barley	0	3	0	0	15	10
1660	12 Char. II.	Importation permitted, when the prices did exceed, for						
		Wheat	2	4	0	2	12	9
		Rye	1	16	0	2	3	2
		Beans, barley, and malt	1	6	8	1	12	0
1663	15 Char. II. *	Importation permitted, when the prices did not exceed, for						
		Wheat	2	8	0	2	17	7
		Rye, peas, or beans	1	12	0	1	18	5
		Barley, malt, or buck wheat	1	8	0	1	13	7
		Oats	0	13	4	0	16	0
1670	22 Char. II.	Importation permitted, when the prices did not exceed, for						
		Wheat	2	13	4	3	4	0
		Rye, peas, or beans	2	0	0	2	8	0
		Barley, malt, and buck wheat	1	12	0	1	18	5
		Oats	0	16	0	0	19	2
1773	13 Geo. III.	Importation permitted, when the prices were at or above, for						
		Wheat	0	0	0	2	8	0
		Rye, peas, or beans	0	0	0	1	12	0
		Barley or malt	0	0	0	1	4	0
		Oats	0	0	0	0	16	0

* This is the act, in which the inſertion of the word *not* in the important clauſe, entirely altered the intention of the law.

TABLE.

A. D.	Anno Regis.	Abbreviation of Engliſh Importation Laws.
1202	3 John.	Importation of foreign grain invited.
1215	16 John.	Invited.
1266	9 Hen. III.	Invited.
1297	25 Edw. I.	Invited.
1328	2 Edw. III.	Invited.
1350	25 Edw. III.	Invited.
1360	34 Edw. III.	Invited.
1463	3 Edw. III.	Prohibited, until the price exceeded *6s. 8d.* for wheat, *4s.* rye, and *3s.* for barley *per* quarter.
1660	12 Char. II.	Allowed, upon payment of different duties according to the prices.
1663	15 Char. II.	Allowed, upon payments of lower duties.
1670	22 Char. II.	Allowed, upon payment of different duties according to the prices.
1685	1 James II.	Regulations to prevent fraudulent importation.
1729	2 Geo. II.	Regulations for aſcertaining the price of corn at the time of importation, and for receiving the duties, according to the prices.
1732	5 Geo. II.	Further regulations anent the prices, and prohibiting corn imported to be again exported, or carried coaſtways.
1757	30 Geo. II.	Duties upon the importation of corn ſuſpended until the 24th Auguſt 1757, and importation allowed, duty free, in ſhips of foreign nations in amity with Great Britain.
1766	6 Geo. III.	Importation of foreign grain permitted, for a limited time, duty free.
1767	7 Geo. III.	Importation permitted, for a limited time, duty free.
1768	8 Geo. III.	Ditto. Ditto. Ditto.
1769	9 Geo. III.	Importation of rice permitted, for a limited time, duty free.
1772	12 Geo. III.	Importation permitted duty free to 1ſt December.
1773	13 Geo. III.	Permitted, duty free to 1ſt of January 1774. Same year the old corn laws totally altered, and importation of foreign grain and flour permitted, at all times and places, when the price of the quarter was at or above *48s.* for wheat; *32s.* for rye, peas, and beans; *24s.* for barley; and *16s.* for oats. Importation of oatmeal into Scotland permitted duty free, when the price there ſhall exceed *16s.* per boll weighing 8 ſtone Troy.

TABLE.

A. D.	Anno Regis.	Abbreviation of Engliſh Importation Duties.	Price of grain *per* qr.						Duties *per* quarter.					
			Money of the Time.			Preſent Money.			Money of the Time.			Preſent Money.		
			£.	s.	d.	£.	s.	d.	£.	s.	d.	£.	s.	d.
1660	12 Charles II.	For wheat, when the price did not exceed	2	4	0	2	12	9	2	0	0	2	8	0
		when it exceeded that price	0	0	0	0	0	0	0	6	8	0	8	0
		Rye, when the price did not exceed	1	16	0	2	3	2	1	6	8	1	12	0
		when it exceeded that price	0	0	0	0	0	0	0	5	0	0	6	0
		Beans, barley, and malt, when not above	1	6	8	1	12	0	1	6	8	1	12	0
		when above that price	0	0	0	0	0	0	0	5	0	0	6	0
1663	15 Charles II.	For wheat, when the price did not exceed	2	8	0	2	17	7	0	5	4	0	6	5
		Rye, peas, and beans, when not above	1	12	0	1	18	5	0	4	0	0	4	9
		Barley and malt, when not above	1	8	0	1	13	7	0	2	8	0	3	2
		Buck wheat, when not above	1	8	0	1	13	7	0	2	0	0	2	5
		Oats, when not above	0	13	4	0	16	0	0	1	4	0	1	7
1670	22 Charles II.	For wheat, when the price did not exceed	2	13	4	3	4	0	0	16	0	0	19	2
		when above that price, and not exceeding	4	0	0	4	16	0	0	8	0	0	9	7
		when above that price	0	0	0	0	0	0	0	5	4	0	6	5
		Rye, peas, and beans, when not above	2	0	0	2	8	0	0	16	0	0	19	2
		when above that price	0	0	0	0	0	0	0	4	0	0	4	9
		Barley, malt, buck-wheat, not above	1	12	0	1	18	5	0	16	0	0	19	2
		when above that price	0	0	0	0	0	0	0	2	8	0	3	2½
		Oats, when not above	0	16	0	0	19	2	0	5	4	0	6	5
		when above that price	0	0	0	0	0	0	0	1	4	0	1	7
		Britiſh Importation Duties.												
1773	13 Geo. III.	When the price of wheat is at or above	0	0	0	2	8	0	0	0	0	0	0	6
		Rye, peas, or beans, at or above	0	0	0	1	12	0	0	0	0	0	0	3
		Barley, bear, or bigg, at or above	0	0	0	1	4	0	0	0	0	0	0	2
		Oats, at or bove	0	0	0	0	16	0	0	0	0	0	0	2
		And for every hundred weight of wheat flour	0	0	0	0	0	0	0	0	0	0	0	2

TABLE.

Anno Domini.	Anno Regis.	Abbreviation of Scotch Importation Laws.
1454	17 James II.	Importation of foreign grain invited to be made, either by foreigners or denizens.
1493	5 James IV.	Invited.
1663	15 Charles II.	Allowed from Ireland upon payment of a duty of 3 *l. per* boll, when meal and barley did not exceed the price of 8*l. per* boll at home.
1672	24 Charles II.	Importation of victual from Ireland prohibited under ſevere penalties.
1687	3 James VII.	Prohibition to import victual from Ireland renewed, and victual ſo imported ordered to be deſtroyed.
1703	2 Anne.	Importation of victual prohibited from foreign parts, until the price of the boll of grain exceeds 12*l.* for wheat, 8*l.* for bear, meal, and malt, and 6*l.* for oats and peaſe; but with power to the lords of the privy council to ſuſpend this prohibition when neceſſary.
1741	14 Geo. II.	Importation permitted, when the prices of grain, in the county of Edinburgh, exceeded 40*s.* for wheat; 20*s.* for peaſe and beans; 18*s.* for bear and barley; and 13*s.* 4*d.* for oats, *per* quarter, and 8*l.* Scots, *per* boll, for oatmeal, upon payment of the duties fixed by the Engliſh acts of the 22d Charles II.

TABLE.

Anno Domini.	Anno Regis.	Abbreviation of Scotch Exportation Laws.
1555	13 Mary.	Exportation of grain prohibited under ſevere penalties.
1587	20 James VI.	Prohibited.
1663	15 Charles II.	Exportation of grain permitted when the price of victual at home was under 12*l.* for wheat, 8*l.* for bear and barley, and 8 merks for peas and oats, *per* boll; upon payment of the uſual duty.
1669	21 Chaˢ II.	All duties payable upon grain exported removed, except one merk *per* chalder upon every kind of victual.

TABLE.

Anno Dom.	Anno Regis.	Scotch Importation Duties.	Price of Grain per Boll. Money of the Time.	Price of Grain per Boll. Preſent Money.	Duties per Boll. Money of the Time.	Duties per Boll. Preſent Money.
			£. s. d	£. s. d.	£. s. d.	£. s. d.
1663	15 Chaˢ II.	Duties payable upon the boll of all kinds of grain imported, when the boll of barley and meal did not exceed at home - - -	8 0 0	0 16 0	3 0 0	0 6 0
1703	2 Anne.	A duty of 40*s.* per boll, beſides the former duties upon each boll of grain from England for ſeed - -			2 0 0	0 4 0
1741	14 Geo. II.	The ſame duties to be paid in Scotland, as are payable in England upon grain imported by the Engliſh act of 22 of Charles II.				
		Scotch Exportation Duties.				
1663	15 Chaˢ II.	For wheat, when the price of the boll is under -	12 0 0	1 4 0	0 0 5	0 0 6
		bear or barley, when the boll is under -	8 0 0	0 16 0	0 0 5	0 0 6
		Oats and peas, when the boll is under 8 merks -	5 6 8	0 10 8	0 0 5	0 0 6
1669	21 Chaˢ II.	Duty upon each chalder of grain exported, when under the above prices at home - - - -			0 13 4	0 1 1¾
1695	7 William.	Duties upon exportation ceaſed, and bounties commenced.				
		Scotch Exportation Bounties.				
1695	7 William.	For every chalder of grain, when the price of the boll of wheat is at, or under - - -	12 0 0	1 4 0	5 6 8	0 10 8
		For bear, barley, and malt, at or under - -	8 0 0	0 16 0		
		Peas, oats, and meal, at or under - -	6 0 0	0 12 0		
1706	5 Anne.	The ſame bounties with England. -				

As it would appear from what has been advanced in the preceding pages, that on the experience of a great length of time, it would ſeem that the laws and regulations in reſpect to grain, which were brought forward under the acts of 1670, 1688, 1706, and 1732, had conſiderable influence and effect in promoting the improvement of agriculture, increaſing the quantity of corn, and thereby preventing the neceſſity of having recourſe to *importation* for a precarious and uncertain ſupply; it may not only be proper to afford the following tabular view from the valuable work quoted above, of the prices, bounties, and duties, as laid down by them, by which their principles and objects may be more clearly comprehended, but alſo to contraſt them with the regulations concerning thoſe which have been enacted by the law of 1791.

TABLE.—Prices, Bounties, and Duties, on Exportation and Importation of Grain by the former Acts.

Bounties *per* Quarter.		Exportation.	Price of Grain *per* Quarter.		Importation.	Duties *per* Quarter.	
Money of the Time	Preſent Money.		Money of the Time.	Preſent Money.		Money of the Time.	Preſent Money.
£. s. d	£. s. d.		£. s. d	£. s. d.		£. s. d.	£. s. d.
		1. WHEAT, WHEAT-FLOUR.			OR MALT made of WHEAT.		
0 5 0	0 6 0	Bounty, when the price did not exceed - -	2 8 0	2 17 7	there was payable upon importation - -	0 16 0	0 19 2
		when the price was not above -	2 13 4	3 4 0	there was payable - -	0 8 0	0 9 7
		when above that price and not above -	4 0 0	4 16 0	there was payable - -	0 5 4	0 6 5
		and when above that price - -					
		2. RYE, PEASE.			BEANS, BUCK WHEAT.		
0 3 6	0 4 2½	Bounty, when the price did not exceed - -	1 12 0	1 18 5	there was payable upon importation - -	0 16 0	0 19 2
		when the price was not above - -	2 0 0	2 8 0	there was payable - -	0 4 0	0 4 9½
		and when above that price - -					
		3. BARLEY, BEAR.			BIGG, MALT.		
0 2 6	0 3 0	Bounty, when the price did not exceed - -	1 4 0	1 8 9	there was payable upon importation - -	0 16 0	0 19 2
		when the price was not above - -	1 12 0	1 18 5			
		and when above that price - -			there was payable - -	0 2 8	0 3 2½
		4. OATS.			OATMEAL.		
0 2 6	0 3 0	For the quarter of oatmeal, when the price of oats did not exceed - -	0 15 0	0 18 0	there was payable upon the importation of oats -	0 5 4	0 6 5
		when the price was not above - - -	0 16 0	0 19 2	there was payable - -	0 1 4	0 1 7
		and when above that price					

TABLE.—Prices, Bounties, and Duties on Exportation and Importation of Grain, by the latter Act.

Bounties *per* Quarter.		Prices of Grain *per* Quarter.		Duties *per* Quarter.
	1. WHEAT.		WHEAT.	
£. s. d.		£. s. d.		£. s. d.
0 5 0	Bounty when under - - -	2 4 0		
	Exportation prohibited when at, or above	2 6 0		
	when under	2 10 0	there is payable upon importation	1 4 3
	when at, or above	2 10 0	ditto ditto	0 2 6
	but under	2 14 0		
	when at, or above	2 14 0	ditto ditto	0 0 6
	2. RYE.		PEASE and BEANS.	
0 3 0	Bounty when under * - - -	1 8 0		
	Exportation prohibited when at, or above	1 10 0		
	when under	1 14 0	there is payable upon importation	1 2 0
	when at, or above	1 14 0	ditto ditto	0 1 6
	but under	1 17 0		
	when at, or above	1 17 0	ditto ditto	0 0 3
	3. BARLEY.		BEAR or BIGG.	
0 2 6	Bounty when under - - -	1 2 0		
	Exportation prohibited when at, or above	1 3 0		
	when under	1 5 0	there is payable upon importation	1 2 0
	when at, or above	1 5 0	ditto ditto	0 1 3
	but under	1 7 0		
	when at, or above	1 7 0	ditto ditto	0 0 3
	4. OATS.		OATS.	
0 2 0	Bounty when under - - -	0 14 0		
	Exportation prohibited when at, or above	0 15 0		
	when under	0 17 0	there is payable upon importation	0 6 7
	when at, or above	0 17 0	ditto ditto	0 1 0
	but under	0 18 0		
	when at, or above	0 18 0	ditto ditto	0 0 2

N. B.—Flour, meal, and malt, are regulated in proportion to the ſeveral ſorts of grain. The importation of malt is at all times prohibited.

* The bounty, by the tables in the act of parliament, appears to be given only upon rye, and not alſo upon the exportation of peas and beans.

It has been obſerved on theſe tables, by Mr. Mackie, that though the import prices and duties are higher in a ſmall degree in the latter, than was the caſe in the act of 1773, which is ſo far returning to the old ſyſtem, yet that the encouragement held out to the huſbandman is conſiderably leſs, than was the caſe under the ancient regulations. Without conſidering the difference in the value of money between the periods, it may be noticed, he ſays, that the bounty of 5*s.* on wheat, is now withdrawn when it reaches 44*s.*, and exportation ſtopped when it advances to 46*s.* the quarter; while, by the old laws, exportation, with the bounty, was continued till the price reached 48*s.*

And importation, by this act, is permitted on low duties, when the price of wheat advances to 2*l.* 10*s.*; while, by the old acts, the duties were equal to a prohibition, until the price reached 4*l.*, and even then, the duty was high, inſtead of being reduced to almoſt nothing, as is now the caſe, before wheat reaches a price capable of repaying the farmer in an unfavourable ſeaſon. In fact, it is contended, that agriculture has derived little protection or ſupport from the late laws, its continued proſperity depending rather on the impoſſibility of procuring adequate ſupplies of grain from abroad, by which the farmers in this country have, in a great degree, retained the monopoly of the markets, than the countenance it has received from the legiſlature.

Since the period already noticed, however, the above plan has been relinquiſhed, and different changes and alterations have been made in the corn laws, by which it would ſeem that ſome parts of the old ſyſtem have been again in ſome meaſure reverted to.

The act of 1773, by ſo greatly lowering the rates and duties on the importation of foreign grain, had contributed to fix and eſtabliſh the import ſyſtem, and ſpeculation in corn, under the direction of the merchants, by which, from the prices of grain in the markets abroad, being commonly ſo much below thoſe of this country, they were conſtantly ready, by ſome contrivance or other, to open the ports, before the price of the home grain in the markets, came to the rate at which foreign grain was permitted to be imported. It conſequently became neceſſary, from time to time, to paſs acts, in order to counteract ſuch deſigns, and render the general law more efficient.

Accordingly, in 1781, an act was made, 21 Geo. III. c. 50, by which ſo much of the acts of the 1 Ja^s. II.; 5 Geo. II.; 6 Geo. III.; and 14 Geo. III., as related to the aſcertaining of the prices of medium Engliſh wheat, and other grain, in the port of London, and counties of Kent and Eſſex, was repealed; and, in the place of which, an inſpector was appointed, to fix the weekly average prices, from the actual ſales in the ſaid port; by which exportation, and the bounties paid thereon, were to be regulated. But beſides this, an average price is directed to be made up from the weekly returns of each three months, on the firſt day of the ſeſſions held in London, in January, April, July, and September, for the purpoſe of regulating importation for three months, and the duty payable thereon, in the port of London, and the above-mentioned counties. And, in 1783, the law reſpecting corn was ſuſpended, importation being permitted at low duties, and exportation prohibited, till the 25th Auguſt of the ſame year, in England, and the 25th of September in Scotland. 23 Geo. III. c. 1, 53, 81.

In 1789, an act was paſſed, 29 Geo. III. c. 38., for improving and extending the act of the 21 Geo. III. c. 50, by which every corn-factor in London, and the ſuburbs, was neceſſitated to give in weekly returns of his ſales to the inſpectors; and importation was permitted into London, Kent, and Eſſex, when the prices of middling Britiſh grain reached the rates fixed in the act of 1773, as formed from the ſix laſt weekly returns in the port of London, immediately preceding the quarterly ſeſſions, with the exception of oats, which as formerly was directed to be regulated by twelve weekly returns: the act being extended to the maritime counties of England, which were divided into eleven diſtricts. The inſpectors of corn returns, were to be appointed by the juſtices of peace in each county, and directed to make weekly returns of the prices of grain, from not more than twelve, or leſs than eight market towns in each county, the average prices, made from the weekly returns, being directed to be ſent to the collectors of the ports in the diſtrict, for regulating exportation; and the average prices for the whole diſtrict, formed from the ſix weekly returns, immediately preceding the firſt day of February, of May, of Auguſt, and of November, were to regulate the importation of foreign grain and the duties paid thereon.

In 1790, an act of indemnity, 30 Geo. III. c. 1, was paſſed, for abrogating the corn laws, in purſuance of orders from the privy council of the 11th and 18th of November, 23d of December 1786, 2d and 8th of January 1790, by which the above orders are confirmed, and the laws reſpecting corn ſuſpended; no ſort of Britiſh grain being permitted to be exported, except the particular ſpecified quantities for the uſe of the ſugar colonies; but all kinds of foreign grain permitted to be brought freely into every port in the kingdom at the low duties; the act being to continue in full force, until the 29th of September in this year.

And, by the 30 Geo. III. c. 43, the execution of theſe laws was further ſuſpended, until the 28th February 1791, full powers however being given to the privy council, to admit the exportation of all kinds of Britiſh grain, whenever it judged it neceſſary. Further, by the 31 Geo. III. c. 4. the two preceding acts were amended; and, by the introduction of a clauſe in the general corn law, paſſed this ſeſſion, they were continued in full force until its commencement on the 15th of November 1791.

It is remarked by Mr. Mackie, in his "Letters on the Corn Laws," that none of theſe acts for rendering the law of 1773 more efficient, were extended to Scotland, the conſequence of which was, that from the average prices not being fixed and determined by the actual ſales, whenever the ports were opened for the importation of grain from abroad into it, it conſtantly took place, when the current price of produce there was greatly under the reduced rates at which that act even admitted the importation of foreign corn; namely, wheat at 48*s.* the quarter, Wincheſter meaſure, &c. And that, on the contrary, when the overplus quantity of corn was in ſuch abundance, as to permit exportation, the ports there were conſtantly ſhut, before the price of the home produce reached the limit at which exportation ceaſes; both of which caſes operate unfavourably for the agriculture of the country.

In 1791, an act for a new general corn law was paſſed, 31 Geo. III. c. 30., commencing on the 15th of November of the ſame year, by which the 1 Ja^s. II. c. 19.; 1 Gul. & M. c. 12.; 5 Geo. II. c. 12.; 10 Geo. III. c. 39.; 13 Geo. III. c. 43.; 21 Geo. III. c. 50.; 29 Geo. III. c. 58.; and ſo much of the 15 Cha. II. c. 7., as prohibits the buying of corn to ſell again, and laying it up in granaries, when above certain prices, were repealed.

By this act, the maritime counties of England are divided into twelve diſtricts, and Scotland into four diſtricts, making ſixteen in the whole. The prices of grain at the corn exchange in London, being made to regulate the exports and imports of the firſt diſtrict, which comprehends the ports of that city, together with the counties of Kent, Eſſex, and Suſſex. And, in the other diſtricts, the particular market towns, at which the prices and quantities of grain actually ſold are collected, are ſtated in the act. The dealers in grain are directed to give in, on oath, weekly accounts of their actual ſales for that time, to the officer termed the inſpector of returns, who, from ſuch returns, is to make out an account of the general weekly average price of the whole diſtrict, which is to be tranſmitted to the collectors of the cuſtoms at the different ports within the ſaid diſtrict, by which the bounties payable on exportation are to be regulated.

And, at four different times in the year, as within the ſpace of ſeven days after the 15th of February, 15th of May, 15th of Auguſt, and the 15th of November, the receivers of corn returns, in each diſtrict, are to make up the average prices of corn within the ſame, from the laſt ſix weekly returns thereof, with the exception of oats, which is to be made up from twelve weekly returns, this quarterly average being ſent to the collectors of the cuſtoms at the different ports within the ſaid diſtrict, at ſuch periods as mentioned above, by which importation, and the duties payable thereon, are to be regulated for the following quarter.

But, in Scotland, the average prices of grain are not aſcertained from the actual ſales. The ſheriffs of the different counties, once in the month, convene juries for fixing the average price at which it is uſually ſelling, but the witneſſes brought forward produce no account of their actual purchaſes or ſales, only depoſing to what they believe from their own experience, and the opinion of others, to be the current prices. Monthly accounts of the average prices of grain within each county, are made from theſe, by the ſheriffs of the different counties, which are ſent up to the receiver of corn returns in the port of London, from which the receiver is to make up an average account for each diſtrict, and tranſmit it to the collectors of the ports within the ſame, which is to regulate the bounties upon exportation; and, at the above-named quarterly periods, he is to make up the average prices from the two laſt monthly returns, which are to regulate the duties payable upon importation for the following quarter.

But corn from abroad may be imported and landed at any time without payment of duties, provided it be warehouſed under certain regulations, but cannot be taken out of the warehouſe for home conſumption, until the low duties are paid, and ſuch other duties as are payable at the time, in the diſtrict where intended to be uſed; nor can corn of either foreign or home produce be conveyed coaſtways from the port of any diſtrict, where exportation is not permitted, at the time of ſhipping, to the ports of any diſtrict in which exportation is permitted.

And when the general average of the whole country exceeds the rates of import at the low duties, his majeſty, in ſuch caſe, the parliament not being ſitting, can, with the conſent of the privy council, ſuſpend the execution of the act ſo far as to prohibit exportation wholly, and permit importation at the low duties, ſuch permiſſion continuing in force three months; but this power does not extend to prohibiting the exportation of foreign grain warehouſed before.

Since the above act, other laws have been made for the further regulation of the trade in grain. In 1793, an act of indemnity was paſſed, the 33 Geo. III. c. 3. for putting a ſtop to the execution of the general corn law, by an order of council of the 9th of November 1792, prohibiting the exportation of home produce, and granting liberty to import corn from abroad, until the 1ſt of March 1793; and for further ſuſpending the ſaid law, by granting power to his majeſty and council at any time during the ſitting of the parliament, to permit importation and prohibit exportation.

And by the 33 Geo. III. c. 63., the general corn law of 1791 was altered, by the repeal of the clauſes for aſcertaining the average prices of corn in England, and ſubſtituting others of a ſimilar tendency in their ſtead. And further, by granting liberty to his majeſty and council, when parliament is not ſitting, to permit the importation of grain, and prohibit the exportation of home produce, when the general average of the whole kingdom exceeds the prices at which grain can be imported at the low duties from Ireland and the colonies of North America; namely, wheat, 48*s.* rye, 32*s.* barley, 24*s.* oats, 16*s.* Likewiſe, by allowing exportation with a bounty of 1*s.* 6*d.* when oatmeal is under 13*s.* *per* boll; prohibiting exportation to foreign countries, when above 14*s.* the boll.

The law of 1795, the 35 Geo. III. c. 4. paſſed the 13th February, ſuſpends the general corn law of 1791, by giving power to his majeſty, with the conſent of the privy council, to prohibit the exportation and permit the importation of all ſorts of grain from abroad, without the payment of any duties whatſoever. The act to be in force until ſix weeks after the next parliament has met.

In conſequence of a report of a committee of the houſe of commons, made in 1804, on which it appeared, that the price of corn from 1791 to the harveſt of 1803, though very irregular, and increaſed on the average greatly by the years of ſcarcity, has in common afforded a fair profit to the grower; but that, from the ſtimulus of the uſual high prices having increaſed induſtry, by which large tracts of waſte land have been brought into cultivation, which, joined to the two laſt productive ſeaſons, and other cauſes, have occaſioned ſuch a depreſſion in the value of corn, as may tend to the diſcouragement of agriculture, unleſs ſupported by the aid of the legiſlature. Accordingly an act was this year paſſed the 44th Geo. III. c. 109, for the purpoſe of regulating the importation and exportation of corn, and the bounties and duties payable on the ſame; and by which it was enacted, that from and after the 15th of November, 1804, ſo much of the act of the 31 Geo. III. c. 30. as regulates the prices at which Britiſh corn, grain, malt, meal, flour, and biſcuit, may be exported, except to Ireland, and at which corn from abroad, grain, meal, and flour may be imported, except from Ireland, and as fixes the duties and bounties payable thereon, be repealed. Further, that, by this act, the importation and exportation of grain, into and from England and Wales, be regulated by the average price of the twelve maritime diſtricts, and into or from Scotland, by the average price of the four diſtricts of it; and that the bounties and duties be regulated by ſchedules annexed to the act; that whenever the average ſhall be under the prices, at which corn may be importable into Great Britain and Ireland, from abroad, on the low duties, exportation ſhall be permitted from Great Britain to Ireland, &c.; and that the importation and exportation of corn into and from Ireland ſhall be regulated by ſchedules annexed to the act. The firſt ſchedule ſhews the prices, to which the ſcale of bounty is to attach on the export of corn, &c. and the prices at which the exportation is prohibited. According to which wheat may be exported when at or under 48s. the quarter, with a bounty of 5s.; rye at or under 32s. with a bounty of 3s.; peaſe and beans are exportable without a bounty, until at or under 35s.; barley, bear, or bigg, or malt made of barley, bear, or bigg, may be exported at or under 28s. with a bounty of 2s. 6d.; oats at or under 16s. with a bounty of 2s.; wheat, flour, biſcuit, &c. with a bounty of 1s. 6d. *per* cwt.; wheat meal, with a bounty of 1s. 3d. *per* cwt.; barley, bear, or biggmeal, with a bounty of 10d. *per* cwt.; and oatmeal, with a bounty of 1s. *per* cwt. But that when the price of wheat exceeds 54s. that of rye 35s. that of peaſe and beans 35s. that of barley, bear, or bigg, or malt made of them, 31s. and that of oats 19s. no export is to be allowed.

The ſecond ſchedule ſhews the prices, according to which high or low duties are to take place on importation. When imported from the province of Quebec, or the other colonies or plantations in North America, wheat under 53s. the quarter, is ſubject to the high duty of 24s. 3d. the quarter; at or above 53s. but under 56s, to the firſt low duty of 2s. 6d.; and at or above 56s. to the ſecond low duty of 6d.; rye, peaſe, and beans, under 35s. the quarter are ſubject to the high duty of 22s.; at or above 35s. but under 37s. to the firſt low duty of 1s. 6d.; and at or above 37s. to the ſecond low duty of 3d.; barley, bear, or bigg, under 26s. are ſubject to the high duty of 22s.; at or above 26s. but under 28s. to the firſt low duty of 1s. 3d.; and at or above 28s. to the ſecond low duty of 3d.; oats under 17s. are ſubject to pay the duty of 6s. 7d.; at or above 17s. but under 18s. the firſt low duty of 1s.; and at or above 18s. the ſecond low duty of 2d.; oatmeal, if under 16s. 6d. the boll of 140 lbs. avoirdupois, or 128 lbs. Scotch troy, is ſubject for every boll to the high duty of 8s.; at or above 16s. 6d. the boll, but under 17s. 4d. to the firſt low duty of 1s.; and at or above 17s. 4d. the boll, to the ſecond low duty of 2d. When imported from any other country abroad, wheat under 63s. the quarter is ſubject to pay the high duty of 24s. 3d.; at or above 63s. but under 66s. the firſt low duty of 2s. 6d.; and at or above 66s. the ſecond low duty of 6d.; rye, peaſe, and beans, under 42s. pay the high duty of 22s.; at or above 42s. but under 44s. the firſt low duty of 1s. 6d.; and at or above 44s. the ſecond low duty of 3d.; barley, bear, or bigg, under 31s. 6d. pays the high duty of 22s.; at or above 31s. 6d. but under 33s. the firſt low duty of 1s. 3d.; and at or above 33s., the ſecond low duty of 3d.; oats, under 21s., pay the high duty of 6s. 7d.; at or above 21s., but under 22s., the firſt low duty of 1s.; and at or above 22s., the ſecond low duty of 2d.; oatmeal under 20s. the boll, pays the high duty of 8s.; at or above 20s. but under 21s., the firſt low duty of 1s.; and at or above 21s., the ſecond low duty of 6d.

The third ſchedule ſhews the prices to which the ſcale of bounty attaches on the export of corn, ground corn, flour, or meal, malt, &c. from Ireland, and the prices at which the exportation is prohibited. When exported to any country abroad, wheat at or under 29s. 5d. the barrel Britiſh, is allowed a bounty of 3s.; rye, and likewiſe peas and beans, at or under 20s. 4d., a bounty of 1s. 10d.; barley, bear, or bigg, or malt made from them, at or under 16s., a bounty of 1s. 5d.; oats, at or under 10s. 2d., a bounty of 1s. 3d.; wheat flour, biſcuit, &c. a bounty of 1s. 6d. the cwt.; wheat, meal, 1s. 3d. the cwt.; rye meal, or flour, 9d. the cwt.; barley, bear, or bigg flour, 10d. the cwt.; and oatmeal 1s. the cwt. When the price of wheat exceeds 33s. 1d. the barrel, Britiſh; of rye, peas, and beans, 22s. 3d.; of barley, bear, or bigg, or malt made from them, 17s. 8d.; and of oats 12s. 3d., no exportation is permitted.

The fourth ſchedule ſhews the prices according to which the high or low duties are to take place on importation into Ireland.

By the act of the 45 Geo. III. c. 26. ſec. 3, paſſed in 1805, ſo much of the act of the 41 Geo. III. c. 36, as may enable the lord lieutenant of Ireland to prohibit the exportation from it for a limited time, ſo as not to endure longer than the expiration of ſix weeks, after the commencement of the next ſeſſion of parliament, corn, potatoes, and all other proviſions whatever, and to permit the importation of corn, &c. for ſuch limited time, without the payment of duty, and the ſaid act to be further continued in force until the 25th day of March 1806.

The act of the 16th July 1806, 46 Geo. III. c. 97. which is intitled, "An Act to permit the free Interchange of every ſpecies of Corn between Great Britain and Ireland," enacts that the bounty and duties payable on exportation and importation of all corn and grain, meal, flour, bread, or biſcuit, from Great Britain into any port or place of Ireland, or from Ireland, into any port or place of Great Britain, ſhall ceaſe and determine. Provided always that the perſon exporting ſuch articles declare before the chief officer of the cuſtoms that the corn, &c. is really intended to be exported to Great Britain or Ireland, as the caſe may be, on which certificates, &c. are to be given to the exporter as in other caſes of tranſmitting goods coaſtways, without any fee or perquiſite.

And by an act of the 19th February, 1807, the 47 Geo. III. c. 7. the above recited act is amended, it being enacted that the ſaid act, and the ſeveral clauſes and proviſions therein mentioned, concerning the exportation and importation of any ſort of grain or corn, meal, flour, bread, or biſcuit, from Great Britain to Ireland, or from Ireland to Great Britain was intended to extend, and is hereby declared to extend only to ſuch corn or grain, meal, flour, bread, or biſcuit, as is the growth, produce, or manufacture of Great Britain or Ireland reſpectively, and not to ſuch being the growth, produce, or manufacture of any other country or place.

It is obſerved by Mr. Mackie, in his excellent "Letters on the Corn Laws," after ſuggeſting many judicious amendments in the act of 1791, that the power of the crown in ſuſpending theſe laws without the conſent of parliament is a highly dangerous power, which renders them in ſome meaſure of no effect. He conceives that in all free countries agriculture, which is an object of the greateſt national importance, ſhould conſtantly be under the ſacred protection of ſtanding laws, leſt the cultivators of the ſoil ſhould not have their induſtry ſufficiently encouraged. And that at preſent, however deficient the caſe might formerly have been, when capitaliſts are always ready and on the watch to open the ports, and ſpeculate in the introduction of grain from abroad, importation ſhould never be permitted but with the greateſt precaution, nor exportation put a ſtop to contrary to the eſtabliſhed laws, except in caſes of abſolute neceſſity, when indemnity would be readily granted. Some method of counteracting this and other inconveniencies of a ſimilar kind he conceives to be eſſential. From the barriers which had been formerly ſet up, as a preventative of the importation of corn from abroad, being deſtroyed, by the repeal of the old laws and reducing the import duties, a change made by the law of the year 1773, has ariſen, he conceives, the inability of Great Britain to ſupply herſelf with corn the produce of her own ſoil.

"In proportion," ſays he, "as the country advanced in proſperity, the ſurplus quantity, after ſupplying the inhabitants, which uſed formerly to be exported, was gradually abſorbed by the increaſing population and luxury of the nation; and the law in queſtion, among other cauſes, giving a check to the further extenſion of agriculture, neceſſary to counterbalance the additional conſumption, the tide at laſt turned againſt the country, and a regular influx of foreign grain became expedient to ſupply the growing wants of the inhabitants."

The differences which took place in this way, are ſtrikingly ſhewn in the ſtatement given below from. Mr. Dirom, who remarks that no accounts have been preſerved concerning the exports and imports of corn, previouſly to 1697, or that, from the high duties, little trade of this nature was carried on; but that in the years from that period to 1700 incluſive, the amount of the exportation of the different ſorts of grain was 331,223 quarters; while the importation was only 8,948 quarters: that, in the courſe of the ten years from the laſt of the above periods to 1710, the amount of the annual exportation was 248,945 quarters; while the average of the importation only came to 442 quarters. That in one of theſe years (1709) more than half a million of quarters, and in the courſe of the whole, not leſs than 2,849,446 quarters were exported, while only 4,442 quarters were imported.

In the next ten years, from 1711 to 1720 incluſive, the average yearly exportation increaſed to 449,193 quarters; the average annual importation being only 71 quarters. The amount of the exportation of theſe ten years being nearly in a double proportion to that of the preceding ten, ariſing to 4 491,933 quarters; while the import was only 714 quarters.

In the ſubſequent ten years, from 1721 to 1730 incluſive, though from different circumſtances, much foreign grain was introduced in ſome of the years, the exports kept nearly up to the preceding equal period; the amount of the whole of them for theſe ten years being 4,479,683 quarters; the imports of the different kinds of grain being 732,692 quarters.

For the ten years, from 1731 to 1740 incluſive, the act of 1729 having given a check to foreign importation and promoted cultivation, the average annual exportation was 549,447 quarters; while the amount of the average importation was only 4,690: the whole export of the ten years being 5,494,471 quarters; and the whole import only 46,909 quarters.

For the ten years from 1741 to 1750 incluſive, on account of the great induſtry and exertion of the farmers, in conſequence of being releaſed from prohibitory and injudicious laws, the annual average amount of exportation roſe to the extraordinary height of 848,660 quarters; while the imports amounted only to 15,193 quarters. The exports in 1748 were 1,123,953 quarters, in 1749, 1,250,306 quarters, and in the following year the amazing amount of 1,667,778 quarters; the whole for the ten years being 8,486,602 quarters; while the imports of the ſeveral ſorts of grain were only 159,437 quarters.

But for the ten years from 1751 to 1760 incluſive, the exports declined, on the average, to 582,837 quarters; the imports, on the average, being 37,397 quarters. This reduction in the exports is ſuppoſed to have depended on the deficient crops of 1756 and that of the following year.

From about this period the commencement of the import ſyſtem ſeems to have taken its riſe, which has ſince been carried to ſuch an amazing extent.

The imports of the years 1763 and 1764 chiefly conſiſted of oats; but in 1765 they were different ſorts of foreign grain, chiefly wheat, amounting to 218,031 quarters; while the exports of the ſeveral ſorts of corn amounted to the extent of 457,730 quarters. In 1767 the vaſt amount of 907,420 quarters was imported, 500,000 of which were wheat; and on the average of the twelve years, from 1761 to 1772 incluſive, the annual exportation had ſunk to 370,703, the yearly importation having increaſed to 251,279 quarters.

Under the ſanction of the act of 1773, in 1774 the large amount of 926,174 quarters of grain were imported from abroad, one third being wheat or wheat flour; while the quantity exported was not more than 51,099. In 1775 the immenſe quantity of 1,163,407 quarters of foreign corn was imported, half of which being wheat and wheat flour, while the exportation only roſe to 191,007 quarters. On the whole, for the twelve years from 1773 to 1784 incluſive, the annual average importation came up to 578,358 quarters; while the exportation decreaſed to 267,182 quarters. The whole importation of this period being not leſs than 6,940,293 quarters of foreign grain; while only 3,206,184 quarters of grain of home growth were exported.

This reverſe in our corn trade, with the vaſt diſadvantages which are ſuſtained by it to the nation, are ſtill further ſhown by Mr. Mackie in the table of the exports and imports of all ſorts of grain, ſent from or brought into Great Britain, from the concluſion of the above period to the year 1793.

ACCOUNT of Exports and Imports of Corn into Great Britain, from 5th January 1785, to 5th January 1793.

GREAT BRITAIN, *Dr.* — *Cr.*

		Quarters.	Price.							Quarters	Price.				
			s.	*d.*							*s.*	*d.*			
1785	To foreign wheat imported.	110,863	41	10				1785	By wheat exported.	132,685	41	10			
1786		51,463	38	10				1786		205,466	38	10			
1787		59,339	41	2				1787		120,5[illegible]	41	2			
1788		148,710	45	0				1788		82,971	45	0			
1789		107,324	51	2				1789		67,865	51	2			
1790		216,374	53	2				1790		229,754	53	2			
1791		459,490	47	0				1791		71,546	47	0			
1792		22,131	42	2				1792		310,68[illegible]	[illegible]	2			
1793		459,611	48	4	£.	*s.*	*d.*	1793		81,755	48	4	£.	*s.*	*d*
	Average price of the above 9 years 45*s.* 9*d.*	1,635,305	45	9	3,740,760	3	9		Balance paid in 9 years by Great Britain for foreign wheat, or *per. annum* 36,893⅓ qrs. 84,436 *l.* 11 *s.* 5 *d.*	1,303,265	45	9	2,980,831	1	3
										332,040			759,929	2	6
		1,635,305			3,740,760	3	9			1,635,305			3,740,760	3	9

GREAT BRITAIN, *Dr.* — *Cr.*

		Quarters.	Prices.							Quarters.	Price.				
			s.	*d.*											
1785	To foreign barley imported.	67,212	24	0				1785	By barley exported.	166,408	24	0			
1786		62,374	24	4				1786		111,598	24	4			
1787		43,244	22	8				1787		135,089	22	8			
1788		11,479	22	0				1788		212,811	22	0			
1789		12,295	22	10				1789		344,631	22	10			
1790		30,117	25	6				1790		51,163	25	6			
1791		61,135	25	10				1791		41,590	25	10			
1792		118,527	26	8				1792		47,555	26	8			
1793		147,169	31	8	£.	*s.*	*d*	1793		44,463	31	8	£.	*s.*	*d.*
	Average price of				691,940	0	0						1,394,185	0	0
	the above 9 years 25*s.*	553,552	25	0	702,245	0	0			1,115,348	25	0			
	Balance received by Great Britain in the above 9 years for barley exported or *per annum* 80,199⅞ qrs. 78,027 *l.* 4 *s.* 5¾ *d.*	561,796													
		1,115,348			1,394,185	0	0			1,115,348			1,394,185	0	0

ACCOUNT of Exports and Imports of Corn into Great Britain, from 5th January 1785, to 5th January 1793.

GREAT BRITAIN, *Dr.* *Cr.*

		Quarters.	Price.							Quarters.	Price.				
			s.	d.							s.	d.			
1785	To foreign rye imported - -	28,761	28	0				1785	By rye exported	13,163	28	0			
1786		3,643	27	2				1786		6,736	27	2			
1787		7,054	27	8				1787		12,683	27	8			
1788			27	8				1788		31,220	27	8			
1789		14,844	29	10				1789		39,946	29	10			
1790		21,683	34	0				1790		47	34	0			
1791		56,378	31	4				1791		3,528	31	4			
1792		13,027	30	10				1792		16,151	30	10			
1793	Average price of the above 9 years, 30*s.* 1¾*d.*	5,124	34	10	£.	s.	d	1793		512	34	10	£.	s.	d.
					226,868	9	11		Balance paid by Great Britain, in the above 9 years, for rye imported, being *per annum*, for 2947⅗ *qrs.* 4485*l.* 17*s.* 6*d.*				186,495	12	2
		150,514	30	1¾						123,986	30	1¾	40,372	17	9
										26,528					
		150,514			226,868	9	11			150,514			226,868	9	11

GREAT BRITAIN, *Dr.* *Cr.*

		Quarters.	Price.							Quarters.	Price.				
			s.	d.							s.	d.			
1785	To foreign peas and beans imported -	16,813	30	8				1785	By peas and beans exported -	15,904	30	8			
1786		35,709	33	2				1786		16,309	33	2			
1787		42,884	31	10				1787		18,260	31	10			
1788		10,902	27	2				1788		15,135	27	2			
1789		391	27	2				1789		27,891	72	2			
1790		43,168	31	0				1790		17,577	31	0			
1791		14,726	30	6				1791		13,721	30	6			
1792		43,259	31	4				1792		17,291	32	4			
1793	Average price of the above 9 years, 31*s.* 1*d.*	48,274	37	4	£.	s.	d.	1793	Balance paid by Great Britain in the above 9 years for peas and beans imported, being *per annum* for 11,172⅞ *qrs* 17,364*l.* 6*s.* 10*d.* - -	13,483	37	4	£.	s.	d.
					398.062	6	9						241,783	5	3
		256,126	31	1						155,571	31	1	156,279	1	6
										100,555					
		256,126			398,062	6	9			256,126			398,062	6	9

CORN.

ACCOUNT of Exports and Imports of Corn into Great Britain, from January 5th 1785, to January 5th 1793.

Great Britain, *Dr.* *Cr.*

		Quarters.	Price.							Quarters.	Price.				
			s.	*d.*	£.	*s.*	*d.*				*s.*	*d.*	£.	*s.*	*d*
1785	To foreign oats imported -	274,089	17	2	235,259	5	6	1785	By oats exported	25,273	17	2	22,097	13	2
1786		478,473	18	0	430,625	14	0	1786		19,2[illegible]	18	0	17,308	16	0
1787		512,004	15	8	426,670	0	0	1787		17,098	16	8	13,935	18	1
1788		413,827	16	0	313,814	12	10	1788		14,418	15	8	11,294	2	0
1789		429,722	16	0	343,777	12	0	1789		32,68[illegible]	16	0	26,146	8	0
1790		735,173	18	10	692,282	18	2	1790		14,275	18	10	13,422	5	10
1791		788,709	18	2	716,410	13	6	1791		16,35[illegible]	18	2	11,858	10	4
1792		1,008,401	18	2	913,964	4	10	1792		25,709	18	2	23,352	6	10
179	Average price of the above 9 years, 17*s.* 10*d.*	722,523	21	10	788,754	5	6	1793		17,473	21	10	19,074	13	10
		5,362,921	17	10	4,863,559	6	4		Balance paid by Great Britain, in the above 9 years, for oats imported, being *per annum* for 375,593$\frac{9}{4}$ *qrs.* 522,496*l.* 10*s.* 3*d.* -	182,580	17	10	161,090	14	1
										5,180,341			4,702,468	12	3
		5,362,921			4,863,559	6	4			5,362,921			4,863,559	6	4

GENERAL Abſtract of the Exports and Imports of Corn from and into Great Britain for 9 Years, from 1785 to 1793 incluſive.

	Quarters	£.	*s.*	*d.*		Quarters.	£.	*s.*	*d.*
To foreign wheat imported from 1785 to 1793 -	1,635,305	3,740,760	3	9	By wheat exported from 1785 to 1793 - -	1,303,265	2,980,831	1	3
To barley ditto - -	553,552	691,940	0	0	By barley ditto - -	1,115,348	1,394,185	0	0
To rye ditto - -	150,514	226,868	9	7	By rye ditto - -	123,986	186,495	12	2
To peas and beans ditto -	256,126	398,062	6	9	By peas and beans ditto -	155,571	241,783	5	3
To oats ditto - -	5,362,921	4,863,559	6	4	By oats ditto - -	182,580	161,090	14	1
					By ſurplus quantity of grain imported by Great Britain, in the 9 years above-mentioned, after deducting the quantity exported, being at the rate of 564,185 *qrs.* $\frac{9}{3}$ value 550,756$\frac{2}{9}$*l.* *per ann.*	5,077,668	4,956,804	13	8
	7,958,418	9,921,190	6	5		7,958,418	9,921,190	6	5

The ſame writer, after obſerving that the act of 1791 in ſome degree diſcouraged the importation of corn from abroad, by increaſing the rates or duties on it, which was a defect in the old laws, yet ſtill that ſtatute is far from a ſtate of perfection. A radical error had, he conceives, been committed in the outſet of the corn laws, which has never been removed, which is that of the relative regulating rates of exportation and importation for the different kinds of grain, not having been fixed for ſuch, proportionably to their real values, the labour and expence they ſtand the farmer in raiſing and bringing to market, as in ſuch inſtances he would be under the neceſſity of relinquiſhing the cultivation of any particular ſort of grain, ſo rated from the corn dealer, in conſequence being able to have almoſt a complete command of the home market, from his being capable of ſupplying it from abroad. This he contends is the caſe at preſent in regard to oats, as from various ſtatements he ſhews, that if the rate of importation for that ſort of grain had been regulated originally, "in proportion to the current values in 1670 and 1688, when the preſent ſyſtem of corn laws was firſt enacted," it ſhould have been in the following proportion. "As 28 *s.*, the average price of wheat is to 85 *s.* 4 *d.*, the import rate of wheat including the duty, ſo is 12 *s.*, the average price of oats, to 36 *s.* 6 *d.*, being the relative import rate at which oats ought to have been imported, including the duty; whereas the law allowed foreign oats to be imported at 17 *s.* 4 *d.* including the duty. This he ſhews to have continued ſtill the caſe with this ſort of grain, from which the culture has been greatly abandoned by our farmers; and a large importation of that ſort of corn, though much inferior to our own, rendered neceſſary, 5,362,921 quarters having been imported from 1785 to 1793 at the value of 4,863,599 *l.* 6 *s.* 4 *d.*

It is concluded on the whole, that as the "wealth of nations varies conſiderably at different times, ſo ought the rates which regulate the export and import of foreign corn; if theſe affect the money price of our own produce in the home market, and tend to ſink its relative value below the current price of labour, with which it muſt always bear a juſt and neceſſary proportion, the rates muſt conſequently be raiſed in order to preſerve agriculture, the only ſolid baſis on which the real wealth and laſting proſperity of a ſtate can be founded." Should our induſtry and capital continue to increaſe for thirty years, in the ſame ratio it has done ſince the peace of 1783, the money in circulation, the price of labour, and the expence of cultivation may be double what it now is; and the price of corn will naturally increaſe in the ſame degree: ſhould the rates, at which corn from abroad is then permitted to be imported, have a tendency to obſtruct ſuch a riſe, he contends, that they muſt either be heightened or this country will loſe its agriculture, as has already happened in the caſe of oats; but that, on the other hand, ſhould the proſperity of the country decline, ſo as to leſſen the demand for labour, or the floating capital to one-half, the price of corn ſhould ſink in the ſame proportion, to the diminiſhed price of labour, and the import rates be lowered, if the means of preventing ſuch a neceſſary diminution. Conſequently, that, if theſe principles be well founded, a permanent law for the regulation of the export and import of grain, is inconſiſtent with ſound policy; it ſhould be ſuch as to expire regularly at fixed periods, according to the wiſdom of the legiſlature, on taking the ſituation of the country into full conſideration, ſo as to regulate it in conformity to the price of labour, which is "the moſt certain index of the growing proſperity, ſtationary ſituation, or declining ſtate of the nation."

In ſupport of which Mr. Malpus, in his late work on the "Principle of Population," obſerves, that in order "to reſtore our independence, and build our national greatneſs and commercial proſperity on the ſure foundation of agriculture, it is evidently not ſufficient to propoſe premiums for tillage, to cultivate this or that waſte, or even to paſs a general incloſure bill, though theſe are all excellent as far as they go. If the increaſe of the commercial population keep pace with theſe efforts, we ſhall only be where we were before, with regard to the neceſſity of importation. The object required is, to alter the relative proportion between the commercial and the agricultural population of the country, which, he thinks, can only be done by ſome ſyſtem, that will determine a greater proportion of the national capital to the national land." And he "ſees no other way at preſent of effecting this object, but by corn laws adapted to the peculiar circumſtances of the country, and the ſtate of foreign markets." Theſe are ſtated as the leading principles and circumſtances which are neceſſary to be particularly had in view in the framing of laws for the regulation of the trade in corn.

Corn, in *Surgery*, is a hard, dry, cuticular, warty, or horny induration in the ſkin, and ſometimes alſo in the ſubjacent cellular membrane. In the former caſe, the induration may be moved backwards and forwards; but in the latter, it is immoveable. Corns are in general not larger than about the ſize of a ſmall pea, and are produced in conſequence of external preſſure, eſpecially in ſuch parts as are expoſed to much friction, and where the ſkin is very near to the bone. They are, therefore, moſt generally found in the toes, or the ſoles of the feet; but ſometimes alſo in other parts, as on the upper ridge of the hip-bone, where they are produced by the preſſure of women's ſtays. Sometimes alſo ſimilar indurations are formed in the ears of women, who wear heavy ear-rings. When they are formed in the feet, they generally ariſe from the uſe of too narrow or high-heeled ſhoes, and ſometimes merely by wearing the ſtockings too tight. Frequently they produce no inconvenience; but ſometimes they become ſo painful as to render the patient entirely lame. The pain is increaſed by wearing warm ſtockings, tight ſhoes, violent motion of the body, ſtanding or walking too long, drinking ſpirituous liquors, and during variable weather. They are generally painful in hot weather, but rarely ſo in cold.

With reſpect to the cure, the ſurgeon may either endeavour to remove the pain for a time, or radically to free the patient from the diſeaſe. The violence of the pain may be immediately relieved, by the patient's ſitting down, taking off his narrow ſhoes, placing his foot in a horizontal poſition, and cooling it a little. A more permanent relief may be obtained, by ſhaving off the prominent part of the corn with a knife, as far as it can conveniently be got at, without, however, exciting any hæmorrhage, and by the uſe of emollient warm fomentations. The patient cannot be radically freed from his corns, unleſs he reſolves, during the progreſs of the cure, to wear no other than wide, ſoft, and low-heeled ſhoes, and to walk and ſtand as little as poſſible. If this is out of his power, and he is under the neceſſity of frequently walking or ſtanding for a conſiderable time, the preſſure may be prevented in the following manner: Take a piece of linen ſpread with ſome emollient plaſter; lay one piece over another, from eight to twelve times together, and cut a hole in the middle of them, exactly the ſame ſize and circumference as the corn; then apply it in ſuch a manner that the corn enters the hole in the plaſter, and is thus defended againſt the contact of the ſtockings and ſhoes. When ſuch a plaſter has been worn for the ſpace of ſome weeks, the corn, if recent, generally diſappears without requiring any other remedy. When the corn is ſituated in the ſole of the foot, we need only cut a hole into a felt-ſole, ſo as to fit the corn, and introduce it into the ſhoe.

By the following treatment, corns may be removed with certainty, radically, and ſpeedily, eſpecially if we employ at the ſame time the perforated ſole or plaſter: Rub two or three times a day an emollient liniment, ſuch as the ointment of althæa, or, which is ſtill better, the volatile liniment, upon the corn, and keep it covered during the intervals with an emollient plaſter. Every morning and evening let the foot be kept for half an hour in warm water, and the corn well rubbed with ſoap. Let the external part of the corn, which will have become perfectly white, ſoft, and pulpy, be then ſcraped with a blunt knife, till all the ſoft part is removed, and till the operation begins to give pain to the patient; upon which, we muſt immediately deſiſt. This treatment is to be continued till the corn is entirely extirpated; for if we deſiſt from it earlier, the corn will grow again. However, we muſt take care not to cut the part with the knife, ſo as to make it give pain or bleed.

Amongſt a variety of remedies that have been recommended for corns, the following are the principal: green wax, ſoap plaſter, diachylon, mercurial or hemlock plaſter, a piece of bacon, the juicy pulp of a freſh lemon, and even a piece of green oil-cloth, &c. which are to be changed as often as may be neceſſary. The following remedies have alſo been recommended as infallible: ℞ Gumm. ammoniac. Cer. citrin. aa ℥ij Aerug. æris ʒvj. M. F. Emplaſtr. S. To be ſpread upon linen and applied to the corn. Or, ℞ Empl. de galbano, de ammoniac. diachyl. comp. aa ℥ſs. Camph. ℈ij. M. F. Empl. D. S. To be ſpread pretty thick upon linen, and applied to the corn, in pieces juſt ſufficiently large to cover it. In order to aid the operation of the remedy, we may previouſly ſoften the corn in warm water, and ſcrape off as much of it as we are able. The following plaſter has been ſaid to produce the ſeparation of the corn within three or four days: ℞ Gumm. galban. ℥j. in aceto diſſolut. & ad ſpiſſitudinem evaporat. Add. Picis naval ℥ſs. Empl. diach. ſimpl. ʒij. In fine, Sal. ammon. virid. Aeris pulveriſ. aa ℈j. M. F. Empl. The exciſion of the corn is not to be recommended as a radical method of cure, both on account of the difficulty and danger with which it is attended, and becauſe it ſometimes proves unſucceſsful. When the patient has got rid of his corns, he muſt avoid all the abovementioned cauſes which tend to produce them, or they will again return.

Corns, in *Veterinary Science*, a troubleſome diſeaſe in the feet of horſes, moſt generally occurring in the fore feet, and in the inſide heel, within the angle or union of the quarter with the bar; though theſe bruiſes are ſometimes found in both quarters or ſides of the foot.

Terms improperly uſed in any art or ſcience render its acceſs more difficult, obſcure our views of it, and retard its advancement: ſo the term *corns* is, in this caſe, a groſs miſapplication of words, creating perplexity and miſconception, and which actual experience even in the diſeaſe is hardly ſufficient to do away.

When the ſkin of the human foot is gradually compreſſed or rubbed, without any ſudden and violent irritation that ſhall raiſe the cuticle or create a ſore, it thickens firſt, then becomes horny, and is rightly enough termed a corn, from *cornu*, Lat. or *corne*, Fr. *horn*.

In the horſe, on the contrary, whoſe foot is every where thickly clothed with natural horn, ſuch an occurrence, if it were poſſible, could not be a diſeaſe; but if a bruiſe takes place in the foot, at the point above deſcribed, it is alſo called a *corn*, though agreeing in nothing with the former diſeaſe, but in the common circumſtance of its affecting the foot with pain and lameneſs.

Where a corn, as it is called, exiſts in the foot, it is known by a redneſs, more or leſs intenſe, in the angle formed by the union of the bar with the ſides of the foot, and is moſt generally obſerved, as we have already ſtated, in the inner quarter: it is tender, if preſſed upon, producing lameneſs; and if the irritation is carried far enough, it feſters, and the pus, being prevented eſcaping below by the ſole, forms a paſſage inſide the hoof upwards, through the foliated ſubſtance or elaſtic proceſſes, to the coronet; and if a ſhoe, preſſing too hard upon the part, continues to be uſed, the irritation being kept up for a long time, the part becomes weakened in its function, not forming good ſound horn, and a painful diſeaſe is created, which is eradicated with difficulty, and is liable to return, after relief has been obtained, by the ſlighteſt renewal of this permanent preſſure, or of irritation of any kind.

Having briefly deſcribed the diſeaſe, as it commonly appears, we proceed to conſider its cauſe, and the cure.

As it is unequal preſſure that produces corns, even in ſtrong feet, from the ſhoe bearing too hard upon the point of the foot above indicated; ſo, in feet naturally weak, a ſlighter degree of preſſure, if the preſſure be permanent, ſhall be ſufficient to induce it: ſo that the diſeaſe may be obſerved in all ſorts of feet, but far more frequently in weak ones, as in low heeled feet, or where the heels project very much, and the horn turns under, and is thin.

The horſe's foot, we may remark, by being continually bound by the nails which attach the ſhoe to the foot, is ever hardening and diminiſhing in its volume, under their influence and preſſure, and eſpecially all the elaſtic parts of the foot, which, not being then called into much action, become inert and rigid, or are abſorbed; the poſterior parts of the foot, in particular, are deranged by it, and, in its contracting the foot, often forms waving lines of horn, which turn under at the heels, ſo that the ſhoe will take its bearing on the parts ſo diſpoſed, in a direction tending inwards, and bring on bruiſes and weakneſs, or *corns*, as the ſmiths have been pleaſed to call them.

The inflammation induced by the bruiſe or preſſure occaſions an increaſe, or ſometimes rupture, of the blood-veſſels of the part preſſed on, ſo that inſtead of lymph, the red parts of the blood flow into them: and hence that redneſs in the horn of the bruiſed part, the external indication of this diſeaſe.

If the preſſure be ſpeedily and effectually removed, and all external irritation be kept away, healthy horn forms again, and the diſeaſe diſappears; but if the irritation be kept up for any length of time, or has been attended with much violence, the vaſcular parts go on to ſuppurate; and the pus, as we have obſerved, forces its way with great pain to the coronet. Its frequent recurrence leaves the parts very weak, and the ſmiths are then apt to imagine it is natural to them, and convey this idea to others, and ſeldom admit the real cauſe of the diſeaſe.

One circumſtance, we believe not much underſtood, it is of importance to diſcloſe here, reſpecting the production of this diſorder, and which cannot be too generally known and conſidered, as it may be the means of warning thoſe whoſe experience has not yet informed them of the danger: it is this, that if we make a perpendicular ſection of the horſe's foot, acroſs the two points of the heel, where the corns uſually are found, it will be obſerved that the outſide and inſide heels exhibit different appearances: the vaſcular parts lying much lower on the inſide than on the outſide quarter; ſo much ſo, that any one holding the foot from the ground, and levelling the ſole to his eye with his drawing-knife or buttreſs, he would meet with the blood of the inſide quarter before he had brought it to what he would conceive the proper level of the outer, and before he at all ſuſpects it; for the horſe's foot, no doubt for the wiſeſt purpoſes, is not made a regular cone, as on a careleſs inſpection we ſhould apprehend it to be, but is placed inclining on the ground, with the inſide the higheſt, forming a ſpecies of rhomb or lozenge; the inner parts being thinner in horn, more elaſtic, and fleſhy; while the outer are ſtouter in horn, and with leſs vaſcular matter, and more adapted for receiving the wear, which, we may obſerve, takes place primarily on the outer ſide of the toe or pince, as may be ſeen by looking at the ſhoes when taken off, or obſerving the wear of the natural foot unſhod; and thus compreſſion and uneaſineſs are prevented by the greater yielding and elaſticity of the inner quarter and the heels: for had the foot been on every ſide equally unyielding, reſiſtance, compreſſion, and pain, under heavy burdens, or great or long continued exertions of the animal, would have been produced.

It is this difference which may deceive the ſmith, and make him bring the ſhoe nearer the quick on this quarter than he intends; and it is the ſuperior elaſticity and vaſcularity of his fore feet that occaſions them to be more the ſubjects of this diſeaſe than the hind, where corns rarely occur, and which we have heard the ſmiths attribute to the cauſe of their ſtanding with their hind feet in the dung of the ſtable.

The poſition, alſo, in which the ſmith is obliged to hold the foot between his thighs, turned upwards, and drawn away from the horſe outwards, will tend to increaſe his deception, in regard to theſe circumſtances of the apparent levelling of the hoof; and where there is a weak, low, fleſhy heel, as it is termed, a ſlight miſtake is ſufficient to produce a bruiſed heel, or corn, which in ſtouter feet it would be more difficult to do; though in theſe we ſometimes find it has been done.

A ſhoe too narrow for the foot, or with the heel made very ſloping inwards, would alſo induce a bruiſe of theſe parts; for we ſee, by the brightneſs of the ſhoe at this part, after it has been on ſome time and removed, that the nails do not entirely prevent the motion of the heels on this ſurface.

Finally, a ſhoe not equally fitted to bear alike on all the parts of the foot, but bearing on the toe and heels only, eſpecially the inner heel, and not taking ſufficient preſſure at the quarters, would, by this partiality of preſſure, induce inflammation and pain. Clenching the nails too forcibly near the heel, ſo as to induce more preſſure there than at the toe, would alſo do the ſame thing. Under the article FARRIERY, we propoſe conſidering ſome other parts of this ſubject, having barely inſerted enough of that branch of the buſineſs here as may be ſaid particularly to belong to this ſubject.

If this reaſoning, therefore, be true, the corn ariſes from the weakneſs and inſufficiency of the foot to bear the preſſure of a nailed ſhoe, or from partial and ill diſpoſed preſſure in the ſtrong feet, or improper paring: therefore the ancients, who, we believe, knew nothing of this nail ſhoeing, had not their horſes ſubject to this diſeaſe; and ſuch, on examining their writings, turns out to be the fact: for though they have deſcribed, and often moſt truly, the diſeaſes of the horſe, they have not deſcribed this diſeaſe, ſo as for us to conclude on its identity. The "Pulmunculus ad aperturam" of Vegetius, lib. ii. cap. 56. has ſome of the characters of the corn; but it is not clear whether oxen or horſes were the objects of it, and he recommends unſoleing for it: whatever it is, it was probably a diſeaſe ariſing from a weak heel, which, by long journies or rough roads, might be ſo bruiſed as to bring on ſimilar conſequences.

Having treated of the appearance of the corn and its cauſes, we have now to conſider the remedy, firſt obſerving that prevention from it is ever the wiſeſt line of conduct, eſpecially in a diſeaſe where the mechanical cauſes of it are obvious, and can be prevented. Where the corn or bruiſed heel has taken place, the firſt and moſt natural ſuggeſtion is to remove the ſhoe, and take away all the red diſeaſed horn with the drawing knife, ſo as, on the re-application of the ſhoe, to remove all preſſure from the part, and thus admit a new growth of horn not ſubject to external preſſure. For this purpoſe, the horſe may be turned to graſs during its growth, when in general it will grow down apparently perfect: it is, however, if the diſeaſe has been of any duration, too apt to return, if the ſmith brings only the ordinary preſſure of a ſhoe upon it; though this takes place by degrees, and not at the firſt ſhoeing: the parts weakened by the diſeaſe become unable to ſuſtain even this preſſure, and firſt become tender, and afterwards lame; or the parts feſter, according to the degree of it. The barred ſhoe, on this account, is often had recourſe to by the ſmiths with good ſucceſs; the preſſure to the corn being done away by the parts of the ſhoe oppoſite it being bent out of the line or plane of the ſhoe, and then to the foot a light ſtopping of turpentine dreſſings on tow is applied, and bound in with tar ckord. The continuance of this, which is ſeldom perſiſted in long enough, reſtores the horn to ſoundneſs; which being then left off, and the ordinary ſhoe applied, induces again the conſequences, ſooner or later, that we have deſcribed. A ſhoe may be beat or filed out with a ſpace oppoſite the corn; but we have found it more eaſy and certain, when the parts are arrived at this ſtate, to make a ſhoe rather thicker than the ordinary ſhoe, and to cut off entirely that extremity of it that comes oppoſite the corn, to a ſhort diſtance from it, ſo as to be aſſured no preſſure can ariſe from the ſhoe itſelf; for if the ſhoe be left long, however managed, by long wear it is apt to play and become relaxed, from the parts both of the hoof and ſhoe giving way to each other, and thus creating a degree of looſeneſs, when the heel of the ſhoe, coming upon the part, reproduces the diſeaſe. It will be objected to this propoſal, that the corn is left unprotected, and at firſt it will be a little tender, but this will ſpeedily go off, and at each ſhaving will become of leſs conſequence; and it is better of the two evils to contend with the occurrence of accidental preſſure from irregularities in the road, than the perpetual preſſure of the ſhoe. In ſlight caſes, after the ſhoe has been nailed on pretty firmly, we have taken a ſmall ſaw, and ſawed away the horn reſting on the ſhoe at this part, ſo as to make it preſs leſs there than on any other part of the foot; but if the ſhoe be allowed to ſtay on too long, the nails, as we before ſtated, become relaxed, by the horn giving way, and preſſure will occaſionally take place on the corn.

Of late we have had ſeveral opportunities of uſing the ſhoe above deſcribed, and have found it in practice beyond our expectation; nor have we found it, though avowedly imperfect, produce any of the ills we had apprehended it would be ſubject to. There are other methods than thoſe we have deſcribed, but we do not mention them, from finding them inſufficient. Where pus has formed, the horn covering it being effectually removed, digeſtives of turpentine are uſed, as in any other wound, till the horning of the ſore takes place, when the cauſe that originally produced it muſt be carefully avoided.

CORN-*Bottle*, in *Agriculture*. See CENTAURY and WEED

CORN-*Butterfly*, in *Entomology*. See PAPILIO.

CORN-*Crowfoot*, in *Agriculture*, is the common name of a plant of the weed kind, often found among corn crops, and which is very troubleſome to the farmer. It has an upright ſtem, with pale green leaves, cut into long narrow acute ſegments, the flowers are of a pale colour. It is extremely difficult to be eradicated from places where it is eſtabliſhed. See WEED.

CORN, *Ears of*, in *Natural Hiſtory*. Under this name different authors have deſcribed a variety of organic remains found in the ſtrata of the earth. M. Scheuchzer, in particular, gives the figure of a foſſil, which he deſcribes as an ear of corn, and from its figure, and ſuppoſed fulneſs, he argues, that the Moſaic deluge took place in the month of May! but Mr Walch conſiders this body rather as a zoophyte, the rays of which are divided by tranſverſe lines, marking their ſeparation into diſtinct vertebra.

The ſpica ſecalina, and graminis panici of Dr Richardſon, and the ear of barley which Mylius has figured, are of like doubtful origin; the latter, in particular, does not bear the proportions of an ear of barley.

The ſtangengraupen of the German mineralogiſts more nearly reſemble ears of corn, than the above. Theſe are flat, oblong, blackiſh, and ſometimes greeniſh bodies; but, becoming white, and acquiring a metallic luſtre on their prominent parts by friction. Many have ſuppoſed theſe to be mineral ſubſtances, to which mere accident has given their preſent form; but they ſeem to be real vegetable ſubſtances, impregnated with metallic particles. They vary conſiderably in form, but are in general flattened, and are ſtudded with little round prominences, bearing very much the appearance of corn. They are found but very rarely, and perhaps only in the copper mines of Frankenburg in Heſſe. M. Lihman, who has written expreſsly on theſe ſubſtances, does not conſider them as changed vegetable ſubſtances, but as being of mineral origin; he found them to conſiſt of copper, arſenic, ſulphur, and iron, with a ſmall quantity of ſilver in their compoſition. Wolfart, who has delineated and deſcribed theſe ſubſtances, calls them *frumenti metallares*, acknowledging that he cannot refer them to any particular ſpecies of grain. Mr. Parkinſon gives two figures of theſe ſubſtances, but concludes his deſcription thus: "I am therefore of opinion, that we muſt be ſatisfied with conſidering them as foſſils, whoſe origin muſt be referred to ſome hitherto unknown ſubject of the vegetable kingdom." Mr. Whitehurſt, "Theory of the Earth," p. 169. mentions corn among the vegetable impreſſions found in the coal meaſures of Derbyſhire; but this is doubtleſs as ill-founded as any of the foregoing; and we have the beſt reaſon to ſuppoſe, that minute and ſcientific examinations will place all theſe among the incognita of a former ſtate of aquatic exiſtence.

CORN-*Farm*, in *Agriculture*, is that ſort of farm which is principally cultivated and conducted under the ſyſtem of corn, or the chief produce of which is grain. All the more dry ſorts of land are adapted to this purpoſe. See CORN and FARM.

CORN-*Flag*, in *Botany*. See GLADIOLUS.

CORN-*Flag*, in *Agriculture*, is the name of a troubleſome plant of the weed kind, which increaſes greatly by the root; when eſtabliſhed in the field, it is with difficulty extirpated, as it is capable of ſending up new plants from every part of its roots. See WEED.

CORN, *Indian*. See INDIAN *Corn* and MAIZE.

CORN *Land*, that kind of land which is adapted to the growth of grain. See FARM.

CORN, *Lent*, is a term applied to that ſort of grain which is uſually ſown, or put into the ſoil about that ſeaſon.

CORN *Marygold*, is the name of a plant of the weed kind, of which there are two ſpecies, one found commonly in arable land, and the other in paſtures of the more moiſt kind. It is a great enemy to all ſorts of corn crops. It is extirpated with much difficulty, as it multiplies both by its roots and ſeeds. Deep and effectual hoeings, frequently repeated, are of courſe requiſite, before it runs up to ſeed. See WEED.

CORN *Meaſure*, in *Rural Economy*, that ſort of meaſure which is uſed for grain. See MEASURE, and WEIGHTS and MEASURES.

CORN *Mill*, that ſort of mill which is employed in the grinding of corn. See MILL.

CORN *Parſley*, in *Agriculture*, is the name of a low branching plant of the weed kind, often met with among corn crops. See WEED.

CORN *Rent*, that ſort of rent which is regulated by the price of grain. See RENT.

CORN-*Rents*, in *Law*, denote thoſe third parts of the old rents on college leaſes, which were to be reſerved by the leſſees. Stat. 18 Eliz. cap. 6. Theſe were the invention of lord-treaſurer Burleigh, and ſir Thomas Smith, then principal ſecretary of ſtate, for upholding the revenues of colleges.

Theſe great ſtateſmen, obſerving how much the value of money had ſunk, and the price of all proviſions riſen, by the quantity of bullion imported from the new-found Indies, which effects were likely further to increaſe, deviſed this method. Their foreſight and penetration have in this reſpect been very apparent; for though the rent ſo reſerved in corn was at firſt but one-third of the old rent, or half of what was ſtill reſerved in money, yet now the proportion is nearly inverted; and the money ariſing from corn rents is, *communibus annis*, almoſt double to the rents reſerved in money.

CORN-*Rocket*, in *Botany*. See BUNIAS.

CORN-*Sallad*, in *Agriculture*, a ſpecies of the Valerian. See VALERIAN.

CORN-*Sharping*. See SHARPING.

CORN, *Spring*, a term ſignifying ſuch ſorts of grain as are put into the earth in the ſpring ſeaſon.

CORN-*Stand*. See STAND.

CORN-*Stubble*, that ſort of ſtubble which remains after reaping or cutting any ſort of grain crop. It ſhould conſtantly be collected for the purpoſe of litter. See STUBBLE.

CORN-*Stubble Rake*, is a large kind of horſe-rake, employed in ſome counties with much benefit. See RAKE.

CORN-*trug*. See TRUG-*corn*.

CORN-*violet*. See WEED.

CORN, *white*, a general term uſed to ſignify all ſorts of grain.

CORN-*Worm*, a ſort of inſect of the caterpillar kind, which is ſaid to be very detrimental to corn.

CORNA, in *Ancient Geography*, an epiſcopal town of Aſia, in Lycaonia, mentioned in the acts of the council of Chalcedon, held in 451.

CORNA, in *Geography*, a town of Aſiatic Turkey, in the Arabian Irak, on the Euphrates; 6 miles N. W. of Baſſora.

CORNACHINE POWDER, in *Pharmacy*, a purging powder,

der, called alſo earl of Warwick's powder, and pulvis de tribus. It is compoſed of equal parts of antimonium diareticum, diagrydium, and cream of tartar.

CORNACHINI, Thomas, in *Biography*, born at Arezzo, in Tuſcany, about the middle of the 16th century, obtained conſiderable celebrity, as profeſſor of medicine at Piſa, where he lectured to large audiences ſeveral years. He died in 1625, and was ſucceeded in the profeſſorſhip by his ſon Mark, who publiſhed at Venice, in 1607, in fol. "Tabulæ Medicæ," the only work left by his father, in which he has collected the deſcriptions and accounts of diſeaſes left by the Greek and Arabian phyſicians, with commentaries upon them. His ſon had the credit of giving his name to a purging powder, Pulvis Cornachini. conſiſting of calomel, ſcammony, and burnt hartſhorn, which ſtill retains its credit, for its efficacy in deſtroying the aſcarides, a ſmall worm, infecting the bowels of children. Mark alſo publiſhed, "De Hominis Generatione, de vino, et aqua, balneiſque Piſanis," Franckfort, 1607. fol. and a "Diſcovery on the Method of Curing, tuto, cito, et jucundé," he ſays, all thoſe diſeaſes, which are ſaid to be derived from peccant humours. Haller Bib. Med. Eloy Dict. Hiſt.

CORNACUM, in *Ancient Geography*, a town of Lower Pannonia, according to Ptolemy and Antonine's Itinerary.

CORNAGE, an ancient tenure, the ſervice whereof was to blow a horn, when any invaſion of the Scots was perceived.

This tenure, which was a ſpecies of grand ſerjeanty, was very frequent in the northern counties, near the Picts and the Roman walls; but by ſtat. 12 Car. II. all tenures are converted into free, and common ſocage.

An old rental calls *cornage, neatgeldt*, q. d. *neat-geld.* Lord Coke ſays, in old books, it is called HORNGELD.

CORNARISTS, in *Eccleſiaſtical Hiſtory*, the diſciples of Theodore Cornhert, an enthuſiaſtic ſecretary of the ſtates of Holland. He writ at the ſame time againſt the Catholics, Lutherans, and Calviniſts. He maintained that every religious communion needed reformation; but he added, that no perſon had a right to engage in accompliſhing it, without a miſſion ſupported by miracles. He was alſo of opinion, that a perſon might be a good Chriſtian, without being a member of any viſible church.

CORNARIUS, John, in *Biography*, a phyſician of great eminence, and author of numerous treatiſes on the theory and practice of medicine, was born at Zwickaw, in Upper Saxony, in the year 1500. Haller ſays, his proper name was Haguenbot or Hanbut, but that following the cuſtom of the time, he took the name of Cornarius, which he affixed to all his publications. He is ſaid to have attached himſelf to the ſtudy of medicine, in the hope of diſcovering ſome method, or medicine, capable of reſtoring, or invigorating his conſtitution, naturally feeble and delicate. With this view, he reſided in ſucceſſion, at ſeveral German univerſities, and at length at Baſle, in Switzerland, where he met with copies of Hippocrates, Ætius, and other of the Greek fathers, in their own language, which he had not before been able to procure. Returning with this treaſure to his own country, having previouſly taken the degree of doctor in medicine at Padua, he ſet himſelf down to tranſlate firſt the works of Hippocrates into Latin, which he completed in five years, and publiſhed at Baſle, in folio, in 1543; then Ætius, and Paul of Ægina. He had before publiſhed, *viz.* in 1529. "Univerſæ rei medicæ, epigraphe, ſeu enumeratio," which has been ſeveral times reprinted. "De rectis medicinæ ſtudiis amplectendis" "De conviviorum veterum Græcorum;" "De peſte libri duo; de Podagræ laudibus," in 1553, with various other diſſertations. While thus employed, he did not neglect the practice of medicine, of which he is ſaid to have had a conſiderable portion. His tranſlations of Hippocrates, having been rudely attacked by Fuchſius, he anſwered it by a ſatyrical effuſion, which he called, Vulpecula excoriata. This was printed at Franckfort in 1543, in 4to. Fuchſius anſwered this by a ſimilar piece of ſatire, Cornarius furens. The tranſlation of Hippocrates has long ſince been ſuperſeded by thoſe of Vander Linden, and Fœſius, and thoſe of Ætius, and Paulus Ægineta, were not much longer lived. They were however works of great labour, and contributed to leſſen the difficulties of the taſk to thoſe that followed. Cornarius died at Jena, March the 16th, 1558. His ſon, Diomede, ſucceeded to his practice. He was appointed profeſſor of medicine, in the univerſity of Vienna, and phyſician to the emperor Maximilian II. He publiſhed at Leipſic, in 1595, in 4to. "Conſiliorum medicinalium tractatus;" alſo "Hiſtoriæ admirandæ raræ, et orationes medicinales." Haller Bib. Eloy. Dict. Hiſt.

CORNARO, Francis, cardinal and biſhop of Breſcia in the ſixteenth century, began his career as a military man, during the conteſts in Italy excited by the rival intereſts of Charles V. and Francis I. in which the Venetian republic was involved. Upon a general pacification, he quitted the army and devoted himſelf to the purſuits of literature and the ſtudy of politics. He was afterwards fixed upon as ambaſſador from the republic to the emperor Charles V. In 1527 he was raiſed to the dignity of cardinal by pope Clement VII. and after his admiſſion into the college, he confined his labours to the deliberations of that body, where his learning and experience were highly appreciated. He died in his ſixty-fifth year, A. D. 1543, of the gout, with which he had been long afflicted. Moreri.

Cornaro, George Basil, cardinal and biſhop of Padua, was born in 1658. He alſo began life in the army, which he left for the church. He was member of the order of Malta, and grand prior of Cyprus, an office which was hereditary in his family. His application to literature, and his acquirements by foreign travel, pointed him out as a perſon well and highly qualified to fill offices of great reſponſibility in the republic. He was firſt appointed to the ſuperintendency of the marine, and would have been ſent as ambaſſador to France, had not his preference led him to embrace an eccleſiaſtical life. He accordingly went to Rome, where he was entruſted with certain commiſſions which led him to high preferment and great dignities in the church.

In 1692 he was appointed ambaſſador to the court of Portugal, and was made titular archbiſhop of Rhodes. On his return, he was created cardinal by Innocent XII. and nominated to the biſhopric of Padua. He died in the year 1722. Moreri.

Cornaro, Lewis, of a noble Venetian family, though from his not enjoying the honours attached to it, ſuppoſed not to have been legitimate, was born in 1467. He lived to a great age, which he attributed, and probably with juſtice, to a ſtrict, abſtemious regimen, adopted by him, on his recovering from a ſevere illneſs, when he was more than forty years of age. His health had been declining ſeveral years, prior to this attack, owing as he acknowledges to his living a debauched and voluptuous life. In entering on his new regimen, he took care to avoid, he ſays, the extremes of heat, or cold, together with all violent exerciſe, and to live in a pure dry air; all which, he contended, were equally important in attaining the end propoſed, the reſtoration of a decayed conſtitution, as temperance and diet. During the remainder of his life, he only took twelve ounces of ſolid food, *viz.* bread, ſoups, yolks of eggs, and meat, and fourteen ounces of wine in the day. This portion, as he grew old, he rather diminiſhed than increaſed, obſerving that the power of concoction is then leſs vigorous, and as that weakens, the ingeſta ſhould be leſſened. He married a lady of the houſe of Spilemberg, at Udina, by whom he had an only child, a daughter, when they were both advanced in years. At the age of 83 he wrote his "Diſcorſi della vita ſobria:" a ſhort treatiſe on the advantages of temperance, from which this account is principally taken. The work has been repeatedly tranſlated, and printed in every country in Europe. He was then, he ſays, ſo briſk, lively, and active, that he could mount his horſe, without aſſiſtance from any riſing ground. Sometimes he retired to his villa, ſeated in a valley, watered by the Brenta, encircled with large, well cultivated fields, and a conſiderable number of buildings, made habitable by his own induſtry. "It had been full of fens and bogs, he ſays, a habitation, more fit for ſnakes, toads, and ſerpents, than for man." He had the pleaſure of enjoying the ſociety of his daughter and eleven grandchildren ſhe had produced; who amuſed him with their muſical exhibitions, in which ſcience as well as in that of architecture, he had no inconſiderable ſkill. He died at Padua, April 26th, 1566, at the age of 98. His wife, who ſurvived him, lived alſo to nearly the ſame age. Sir John Sinclair, in his "Code of health and longevity," mentions the edition of 1779 as the beſt Engliſh tranſlation of Cornaro's works. There are four diſcourſes on one ſubject, penned at different times; the firſt, which he wrote at the age of 83, is intitled "A treatiſe on a ſober life," in which he declares war againſt every kind of intemperance. The ſecond was compoſed three years after, and contains directions for repairing a bad conſtitution. The third he wrote when he was 91, entitled "An earneſt exhortation to a ſober life;" and the laſt is a letter to Barbaro, patriach of Aquileia, written when he was 95, which contains a lively deſcription of the health, vigour, and perfect uſe of all his faculties, which he had the happineſs of enjoying at that advanced period of life. Eloy. Dict. Hiſt. Gen. Biog.

Cornaro-Piscopia, Lucretia Helena, an illuſtrious Venetian lady, was born at Venice in 1646. At the age of eleven having imbibed a devotional temper, and an ardent love of literature, ſhe took a vow of chaſtity, which ſhe maintained through life, though a diſpenſation was obtained from it, without her knowledge. She was an excellent linguiſt, being thoroughly converſant with ſeveral of the modern languages and with the Latin, the Greek, Hebrew, and Arabic. She had a taſte for poetry and muſic, and compoſed verſes which ſhe ſung to her inſtrument. In many of the abſtruſe ſciences ſhe was deeply read, and acquired ſo much reputation, that it was propoſed to give her a ſeat among the doctors of theology at Padua; this was oppoſed by the biſhop; ſhe was however honoured with a cap of doctor in philoſophy. The ceremony uſed on the occaſion was performed in 1678 in the cathedral of Padua, at which an immenſe concourſe of people was aſſembled as witneſſes of ſo extraordinary a ſight. She was elected a member of all the principal literary ſocieties in Italy, and no perſon of diſtinction viſited the country without paying his reſpects to this excellent lady. She had a great deſire to enter into ſome religious ſociety; but by the entreaties of her father ſhe remained under his roof, contenting herſelf with wearing the habit of the Benedictine nuns, and obſerving the rules of the order. She died in the year 1684, and her works were collected and publiſhed in 8vo. at Parma, 1688, but their merit is not equal to the high reputation which the author ſuſtained during life. Moreri.

CORNAU, in *Geography*, a town of Germany, in the circle of Weſtphalia, and county of Diepholz; 6 miles N. of Diepholz.

CORNAVII, in *Ancient Geography*, a people of the iſle of Albion, who were ſituated to the weſt of the Coritani or Cor-Iceni, in that country, according to Camden, which is now divided into Warwickſhire, Worceſterſhire, Shropſhire, and Cheſhire. There were ſeveral Britiſh tribes of this name, in other parts of this iſland; and particularly in the moſt northerly part of Britain, called Strathnavern, which ſeems to retain ſome veſtige of the name of its firſt poſſeſſors; and they all ſeem to have been called Cornavii, from the two Britiſh words *Corn*, a horn, and *Av*, a river, deſcriptive of the form and ſituation of their reſpective countries. Beſides the Cornavii, there was another Britiſh tribe or nation, ſeated in the countries above mentioned; and ſeeming to have poſſeſſed the beſt part of the two counties of Warwick and Worceſter. This nation is called by Tacitus (Annal. l. xii. c. 38.) the Jugantes, by a miſtake as it is thought of his tranſcribers, for Wigantes, or Huicii, their real name.

The Wigantes, ſignifying in the ancient language of Britain, brave men, ſeem to have been an independent nation under their own prince Venutius, who married the famous Carteſmandua, queen of the Brigantes. But both the Wigantes and Cornavii, were in ſuch ſtrict alliance with the Iceni and Cor-Iceni, that they were reduced at the ſame time, and by the ſame generals, under the dominion of the Romans. (Tacit. Annal. l. xii. c. 29, 30.) That brave and induſtrious people built many forts, ſtations, and towers in the country of the Cornavii and Wigantes, to keep the inhabitants in ſubjection.

As the ſecond journey of Antoninus from beyond the wall of Severus to Richborough in Kent, paſſes through this country from north to ſouth, it will conduct us to ſeveral of theſe Roman towns and ſtations. The moſt northerly of theſe towns was Condate, ſuppoſed to be Northwich in Cheſhire. We come next to Diva or Deva, now Cheſter, which was a city of great conſideration in the time of the Romans, a colony, and the ſtation of the 20th legion. Purſuing the ſame route ſouthward, we meet with the following towns in their order; Bovium, near Stretton; Mediolanum near Drayton; Rutunium, near Wem; Uriconium, near Wroxeter, the ancient capital of the Cornavii; Uxacona, near Sheriff-Hales; Pennocrucium, near the river Penk; Etocetum, Wall near Litchfield; and Mandueſſedum, near Manceſter, in Warwickſhire. The preciſe boundaries of the ſeveral Roman provinces in Britain are ſo little known, that we cannot be certain whether the whole country of the Cornavii and Wigantes was within the limits of that which was called Britannia Prima, or ſome part of it belonged to Britannia Secunda.

CORNAX, Matthias, in *Biography*, a native of Meldola, a ſmall town in Italy, ſtudied medicine at Venice, where he afterwards continued to practiſe, and was appointed one of the teachers in the art. He is here noticed, on account of his having publiſhed a caſe of a woman who had carried an extra fœtus in the abdomen, for the ſpace of five years. An abſceſs at length forming, near the navel, and burſting, our practitioner enlarged the aperture, and extracted through the wound, a half putrid fœtus. The woman recovered, but becoming again pregnant, and it not being practicable to deliver her by the natural paſſage, ſhe died.

It does not appear that the body was opened. The caſe was originally publiſhed at Venice in 1550, in 4to, "Hiſtoria quinquennis fere geſtationis," &c. It was republiſhed in 1564, with other ſimilar caſes, in the author's "Enchiridion Medicæ conſultationis apud Ægrotos, &c; Baſiliæ," 8vo. Haller Bib. Ch.

CORNAZZANI, Anthony, an eminent Italian poet, who flouriſhed in the fifteenth century. He was born at Placentia. but reſided chiefly in the early part of life at Milan, but after the death of Sforza he was obliged to take refuge at Venice, where he was hoſpitably received by Bartholomew Colleone, whoſe life he afterwards wrote. From Venice he went to France, and from thence to Ferrara, where he finally ſettled under the patronage of Duke Hercules the firſt, and his ducheſs Lucretia Borgia. He is chiefly known by his ſonnets and lyric poems, ſome of which are reckoned the moſt perfect of their kind in the language. He wrote the lives of the Virgin Mary and of Chriſt in verſe; and among his proſe works, we have, beſides the life of Colleone, a treatiſe "De Mulieribus admirandis;" and another entitled "De excellentum Virorum principibus."

CORNE, or Corna, in *Ancient Geography*, a town of Cappadocia, towards the Euphrates, to the ſouth of Melitene.

Corne, in *Geography*, an iſland, ten miles long and one wide, in the gulf of Mexico, near the coaſt of Weſt Florida. N. lat. 30° 11′. W. long. 88° 32′.

Corne, a town of France, in the department of the Mayne and Loire; 7 miles E. of Angers.

Corne. See Horn-*work*.

Corne *a amorcer*, priming-horn. An ox-horn filled with fine powder for priming cannon.

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